



KSR College of
Engineering

AN AUTONOMOUS INSTITUTION



NAAC ACCREDITED **A++** | NBA ACCREDITED PROGRAMMES | IDEALab

B.E. - SAFETY AND FIRE ENGINEERING

REGULATIONS 2024

(Academic Year 2025-26 Onwards)

**Curriculum & Syllabus
Semester I and II**





K.S.R. COLLEGE OF ENGINEERING: TIRUCHENGODE - 637 215
(Autonomous)
DEPARTMENT OF SAFETY AND FIRE ENGINEERING
B.E. - Safety and Fire Engineering (REGULATIONS 2024)

Vision of the Institution

IV To become a globally renowned institution in Engineering and Management, committed to providing holistic education that fosters research, innovation and sustainable development.

Mission of the Institution

- IM 1** Deliver value-based quality education through modern pedagogy and experiential learning.
IM 2 Enrich Engineering and Managerial Skills through cutting-edge laboratories to meet evolving global demands.
IM 3 Empower research and innovation by integrating collaboration, social responsibility, and commitment to sustainable development.

Vision of the Department

DV To produce recognized Safety and Fire Engineers with pioneering innovative solutions to enhance safety and promote sustainable development.

Mission of the Department

- DM 1** Impart quality education through student-centered teaching approaches.
DM 2 Equip students with the cutting-edge knowledge and skills to address the emerging safety challenges.
DM 3 Enhance research and innovation in Safety and Fire Engineering, fostering a culture of safety and sustainability.

Program Educational Objectives (PEOs) B.E. - Safety and Fire Engineering

The graduates of the Programme will be able to

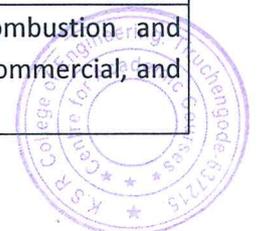
| | |
|--------------|---|
| PEO 1 | Core Competency: Leverage engineering expertise in fire safety, occupational health, and risk management to provide sustainable solutions for Potential hazards. |
| PEO 2 | Professionalism: Graduates will demonstrate leadership, ethics and teamwork in managing emergency response systems and workplace safety. |
| PEO 3 | Career Development: Graduates will undertake higher studies, research and professional development to meet industry demands in Fire and Safety Engineering. |


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| Program Outcomes (POs) | |
|----------------------------------|--|
| PO1 | Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems. |
| PO2 | Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1to WK4) |
| PO3 | Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5) |
| PO4 | Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8). |
| PO5 | Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6). |
| PO6 | The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7). |
| PO7 | Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9) |
| PO8 | Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams. |
| PO9 | Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences. |
| PO10 | Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments. |
| PO11 | Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8) |
| Program Specific Outcomes (PSOs) | |
| PSO1 | Occupational Health and Industrial Safety: Identify, assess, and control workplace hazards using risk analysis, safety audit techniques, and legal compliance frameworks to ensure occupational health and safety in various industries. |
| PSO2 | Fire Protection Systems Design: Apply principles of fire dynamics, combustion and implement effective fire protection and suppression systems in residential, commercial, and industrial environments. |


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K.S.R. COLLEGE OF ENGINEERING

Autonomous

Approved by AICTE and Affiliated to Anna University, Chennai

Accredited by NAAC ('A++' Grade)

Curriculum

UG

R - 2024

Department

Department of Safety and Fire Engineering

Programme

B.E. Safety and Fire Engineering

SEMESTER I

| S.No. | Course Code | Course Title | Category | Periods / Week | | | | | Credit | Max. Marks | | |
|---|-------------|--|----------|----------------|----------|------------|------------|------------|-----------|------------|----|-----|
| | | | | L | T | P | SL | Tot | | CA | ES | Tot |
| Induction Programme | | | - | - | - | - | - | - | - | - | - | - |
| THEORY COURSES | | | | | | | | | | | | |
| 1. | 24ENT19 | Professional Communication | HSMC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 2. | 24MET16 | Engineering Drawing | PCC | 60 | 0 | 0 | 60 | 120 | 4 | 40 | 60 | 100 |
| 3. | 24SFT11 | Basics of Safety & Mechanical Engineering | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 4. | 24GET19 | தமிழர் மரபு / Heritage of Tamils | HSMC | 15 | 0 | 0 | 15 | 30 | 1 | 40 | 60 | 100 |
| THEORY COURSES WITH LABORATORY COMPONENT | | | | | | | | | | | | |
| 5. | 24MAI19 | Matrices and Calculus | BSC | 45 | 0 | 30 | 45 | 120 | 4 | 50 | 50 | 100 |
| 6. | 24PHI06 | Applied Physics | BSC | 45 | 0 | 30 | 45 | 120 | 4 | 50 | 50 | 100 |
| LABORATORY COURSES | | | | | | | | | | | | |
| 7. | 24SFP11 | Computer Aided Graphics & Drawing Laboratory | ESC | 0 | 0 | 30 | 0 | 30 | 1 | 60 | 40 | 100 |
| 8. | 24GEP17 | Manufacturing Practices Laboratory | ESC | 0 | 0 | 30 | 0 | 30 | 1 | 60 | 40 | 100 |
| EMPLOYABILITY ENHANCEMENT COURSE | | | | | | | | | | | | |
| 9. | 24SDP19 | Soft Skills Development - I | EEC | 0 | 0 | 30 | 0 | 30 | 1 | 60 | 40 | 100 |
| TOTAL | | | | 255 | 0 | 150 | 255 | 660 | 22 | 900 | | |

M. S. Kumar
Chairman (BoS)



SEMESTER II

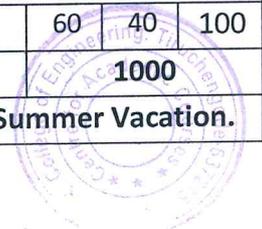
| S.No. | Course Code | Course Title | Category | Periods / Week | | | | | Credit | Max. Marks | | |
|---|-------------|---|----------|----------------|----------|------------|------------|------------|-----------|------------|----|-----|
| | | | | L | T | P | SL | Tot | | CA | ES | Tot |
| THEORY COURSES | | | | | | | | | | | | |
| 1. | 24MET26 | Design Thinking | PCC | 30 | 0 | 0 | 30 | 60 | 2 | 40 | 60 | 100 |
| 2. | 24EET06 | Basics of Electrical and Electronics Engineering | ESC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 3. | 24GET29 | தமிழரும் தொழில் நுட்பமும் / Tamils and Technology | HSMC | 15 | 0 | 0 | 15 | 30 | 1 | 40 | 60 | 100 |
| THEORY COURSES WITH LABORATORY COMPONENT | | | | | | | | | | | | |
| 4. | 24CBI26 | Python Programming | ESC | 45 | 0 | 30 | 45 | 120 | 4 | 50 | 50 | 100 |
| 5. | 24MAI29 | Probability and Statistics | BSC | 45 | 0 | 30 | 45 | 120 | 4 | 50 | 50 | 100 |
| 6. | 24CHI07 | Applied Chemistry | BSC | 45 | 0 | 30 | 45 | 120 | 4 | 50 | 50 | 100 |
| LABORATORY COURSES | | | | | | | | | | | | |
| 7. | 24ENP29 | Professional Communication Laboratory | HSMC | 0 | 0 | 30 | 0 | 30 | 1 | 60 | 40 | 100 |
| EMPLOYABILITY ENHANCEMENT COURSE | | | | | | | | | | | | |
| 8. | 24SDP29 | Soft Skills Development -II | EEC | 0 | 0 | 30 | 0 | 30 | 1 | 60 | 40 | 100 |
| MANDATORY COURSE | | | | | | | | | | | | |
| 9. | 24MCP09 | Mandatory Course - I | MC | 0 | 0 | 30 | 0 | 30 | 0 | - | - | - |
| TOTAL | | | | 225 | 0 | 180 | 225 | 630 | 20 | 800 | | |

SEMESTER III

| S.No. | Course Code | Course Title | Category | Periods / Week | | | | | Credit | Max. Marks | | |
|---|-------------|--|----------|----------------|-----------|------------|------------|------------|-----------|-------------|----|-----|
| | | | | L | T | P | SL | Tot | | CA | ES | Tot |
| THEORY COURSES | | | | | | | | | | | | |
| 1. | 24MAT36 | Optimization Techniques | BSC | 45 | 15 | 0 | 60 | 120 | 4 | 40 | 60 | 100 |
| 2. | 24SFT31 | Principles of Safety Management | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 3. | 24SFT32 | Safety in Engineering Industry | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 4. | 24SFT33 | Fundamentals of Industrial Safety | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 5. | 24SFT36 | Manufacturing Processes | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 6. | 24MET37 | Fluid Mechanics and Machinery | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| LABORATORY COURSES | | | | | | | | | | | | |
| 7. | 24SFP36 | Manufacturing Processes Laboratory | PCC | 0 | 0 | 45 | 0 | 45 | 1.5 | 60 | 40 | 100 |
| 8. | 24MEP36 | Fluid Mechanics and Machinery Laboratory | PCC | 0 | 0 | 45 | 0 | 45 | 1.5 | 60 | 40 | 100 |
| 9. | 24SFP31 | Design Studio - I | PCC | 0 | 0 | 30 | 0 | 30 | 1 | 60 | 40 | 100 |
| EMPLOYABILITY ENHANCEMENT COURSE | | | | | | | | | | | | |
| 10. | 24SDP39 | Soft Skills Development -III | EEC | 0 | 0 | 30 | 0 | 30 | 1 | 60 | 40 | 100 |
| TOTAL | | | | 270 | 15 | 150 | 285 | 720 | 24 | 1000 | | |

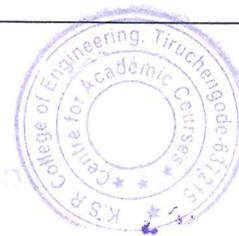
Inplant Training * - The Students Should Undergo Inplant training during the II Semester Summer Vacation.

M. Jeyaraj
Chairman (BoS)



| SEMESTER IV | | | | | | | | | | | | |
|---|-------------|--|----------|----------------|-----------|------------|------------|------------|-----------|-------------|----|-----|
| S.No. | Course Code | Course Title | Category | Periods / Week | | | | | Credit | Max. Marks | | |
| | | | | L | T | P | SL | Tot | | CA | ES | Tot |
| THEORY COURSES | | | | | | | | | | | | |
| 1. | 24MAT46 | Numerical and computational Techniques | BSC | 45 | 15 | 0 | 60 | 120 | 4 | 40 | 60 | 100 |
| 2. | 24MET46 | Strength of Materials | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 3. | 24SFT41 | Safety in Construction | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 4. | 24SFT42 | Safety in Rail and Road Transport | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 5. | 24SFT43 | Chemical Process Safety | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 6. | 24GET09 | Universal Human Values and Ethics | HSMC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| LABORATORY COURSES | | | | | | | | | | | | |
| 7. | 24MEP46 | Strength of Materials Laboratory | PCC | 0 | 0 | 45 | 0 | 45 | 1.5 | 60 | 40 | 100 |
| 8. | 24SFP41 | Safety Engineering Laboratory | PCC | 0 | 0 | 45 | 0 | 45 | 1.5 | 60 | 40 | 100 |
| 9. | 24MEP47 | Design Studio - II | PCC | 0 | 0 | 30 | 0 | 30 | 1 | 60 | 40 | 100 |
| EMPLOYABILITY ENHANCEMENT COURSE | | | | | | | | | | | | |
| 10. | 24SDP49 | Soft Skills Development -IV | EEC | 0 | 0 | 30 | 0 | 30 | 1 | 60 | 40 | 100 |
| 11. | 24SFP42 | Seminar Presentation | EEC | 0 | 0 | 30 | 0 | 30 | 1 | 100 | - | 100 |
| TOTAL | | | | 270 | 15 | 180 | 285 | 750 | 25 | 1100 | | |
| SEMESTER V | | | | | | | | | | | | |
| S.No. | Course Code | Course Title | Category | Periods / Week | | | | | Credit | Max. Marks | | |
| | | | | L | T | P | SL | Tot | | CA | ES | Tot |
| THEORY COURSES | | | | | | | | | | | | |
| 1. | 24SFT51 | Planning and Design of Fire Protection Systems | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 2. | 24SFT52 | Occupational Health and First Aid | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 3. | 24SFT53 | Fire Engineering Fundamentals | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 4. | 24SFT54 | Chemical Technology and Reaction Engineering | PCC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 5. | | Professional Elective – I | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 6. | | Professional Elective – II | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| LABORATORY COURSES | | | | | | | | | | | | |
| 7. | 24SFP51 | Occupational Health and First Aid Laboratory | PCC | 0 | 0 | 45 | 0 | 45 | 1.5 | 60 | 40 | 100 |
| 8. | 24SFP52 | Fire Engineering Laboratory | PCC | 0 | 0 | 45 | 0 | 45 | 1.5 | 60 | 40 | 100 |
| EMPLOYABILITY ENHANCEMENT COURSE | | | | | | | | | | | | |
| 9. | 24SFP53 | Internship – I * | EEC | 0 | 0 | 0 | 0 | 0 | 1 | 100 | - | 100 |
| 10. | 24SFP54 | Industrial Oriented Course-I | EEC | 0 | 0 | 0 | 0 | 0 | 1 | 100 | - | 100 |
| MANDATORY COURSE | | | | | | | | | | | | |
| 11. | | Mandatory Course - II | MC | 30 | 0 | 0 | 0 | 30 | 0 | 100 | - | 100 |
| TOTAL | | | | 300 | 0 | 90 | 270 | 660 | 23 | 1100 | | |
| Internship – I *-The Students Should Undergo Internship during the IV Semester Summer Vacation. | | | | | | | | | | | | |


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| VERTICAL-I | VERTICAL-II | VERTICAL-III | VERTICAL-IV | VERTICAL-V | VERTICAL-VI |
|--|---|--|------------------------------------|---|--|
| Hazard Management and Safety Standard | Fire Safety Systems | Radiation Safety | Safety in Industries | Environmental Safety Engineering | Occupational Health, Hygiene & Ergonomics |
| Hazard Analysis and Risk Assessment | Fire Engineering | Radiation Protection | Plant Layout and Material Handling | Environmental Impact Assessment | Work Study and Ergonomics |
| Industrial Engineering | Life Safety In Building Fire | Heat and Mass Transfer | Safety in Chemical Industry | Environmental Protection and Waste Management | First Aid and Emergency Procedures |
| Safety Management | Fire Fighting and Safety Equipment | Power Plant Engineering | Safety in Powder handling | Air and Water Pollution control | Industrial Ecology |
| Advanced Safety Engineering and Management | Fire Risk Analysis and Accident Investigation | Food and Industrial Bio Safety | Safety in mines | Rescue Equipment and Techniques | Industrial Safety, Health and Environment Acts |
| Hazard Control in Manufacturing Industry | Fire Dynamics | Nuclear Safety and Radioactive Materials | Safety in Petroleum Industries | Atmospheric Ground and Ocean Dispersion | Human Factors Engineering |
| Fire Safety Codes and Standardization | Explosive Technology and Safety | Nuclear Engineering and Safety | Safety in Textile Industry | Global Warming & Climate Change | Safety In Health Care Management |


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K.S.R. COLLEGE OF ENGINEERING (Autonomous)
(Approved by AICTE & Affiliated to Anna University)
Accredited by NAAC "A++" Grade
K.S.R. Kalvi Nagar, Tiruchengode – 637 215

CURRICULUM
UG
R – 2024

Department Department of Safety and Fire Engineering

Programme B.E – Safety and Fire Engineering

List of Electives

VERTICAL I : Hazard Management and Safety Standard

| S.No. | Course Code | Course Name | Specialization | Category | Periods / Week | | | | | Credit | Maximum Marks | | |
|-------|-------------|--|----------------|----------|----------------|---|---|----|-----|--------|---------------|----|-----|
| | | | | | L | T | P | SL | Tot | | C | CA | ES |
| 1. | 24SFE01 | Hazard Analysis and Risk Assessment | S1 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 2. | 24SFE02 | Industrial Engineering | S1 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 3. | 24SFE03 | Safety Management | S1 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 4. | 24SFE04 | Advanced Safety Engineering and Management | S1 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 5. | 24SFE05 | Hazard Control in Manufacturing Industry | S1 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 6. | 24SFE06 | Fire Safety Codes and Standardization | S1 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |

VERTICAL 2 : Fire Safety Systems

| S.No. | Course Code | Course Name | Specialization | Category | Periods / Week | | | | | Credit | Maximum Marks | | |
|-------|-------------|---|----------------|----------|----------------|---|---|----|-----|--------|---------------|----|-----|
| | | | | | L | T | P | SL | Tot | | C | CA | ES |
| 1. | 24SFE07 | Fire Engineering | S2 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 2. | 24SFE08 | Life Safety In Building Fire | S2 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 3. | 24SFE09 | Fire Fighting and Safety Equipment | S2 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 4. | 24SFE10 | Fire Risk Analysis and Accident Investigation | S2 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 5. | 24SFE11 | Fire Dynamics | S2 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 6. | 24SFE12 | Explosive Technology and Safety | S2 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |

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| VERTICAL 3 : Radiation Safety | | | | | | | | | | | | | | |
|-------------------------------|-------------|--|----------------|----------|----------------|---|---|----|-----|--------|---------------|----|-----|-------|
| S.No. | Course Code | Course Name | Specialization | Category | Periods / Week | | | | | Credit | Maximum Marks | | | |
| | | | | | L | T | P | SL | Tot | | C | CA | ES | Total |
| 1. | 24SFE13 | Radiation Protection | S3 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 2. | 24SFE14 | Heat and Mass Transfer | S3 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 3. | 24SFE15 | Power Plant Engineering | S3 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 4. | 24SFE16 | Food and Industrial Bio Safety | S3 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 5. | 24SFE17 | Nuclear Safety and Radioactive Materials | S3 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 6. | 24SFE18 | Nuclear Engineering and Safety | S3 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |

| VERTICAL 4 : Safety in Industries | | | | | | | | | | | | | | |
|-----------------------------------|-------------|------------------------------------|----------------|----------|----------------|---|---|----|-----|--------|---------------|----|-----|-------|
| S.No. | Course Code | Course Name | Specialization | Category | Periods / Week | | | | | Credit | Maximum Marks | | | |
| | | | | | L | T | P | SL | Tot | | C | CA | ES | Total |
| 1. | 24SFE19 | Plant Layout and Material Handling | S4 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 2. | 24SFE20 | Safety in Chemical Industry | S4 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 3. | 24SFE21 | Safety in Powder handling | S4 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 4. | 24SFE22 | Safety in mines | S4 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 5. | 24SFE23 | Safety in Petroleum Industries | S4 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 6. | 24SFE24 | Safety in Textile Industry | S4 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |


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| VERTICAL 5 : Environmental Safety Engineering | | | | | | | | | | | | | | |
|---|-------------|---|----------------|----------|----------------|---|---|----|-----|--------|---------------|----|-----|-------|
| S.No. | Course Code | Course Name | Specialization | Category | Periods / Week | | | | | Credit | Maximum Marks | | | |
| | | | | | L | T | P | SL | Tot | | C | CA | ES | Total |
| 1. | 24SFE25 | Environmental Impact Assessment | S5 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 2. | 24SFE26 | Environmental Protection and Waste Management | S5 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 3. | 24SFE27 | Air and Water Pollution control | S5 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 4. | 24SFE28 | Rescue Equipment and Techniques | S5 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 5. | 24SFE29 | Atmospheric Ground and Ocean Dispersion | S5 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 6. | 24SFE30 | Global Warming & Climate Change | S5 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |

| VERTICAL 6: Occupational Health, Hygiene & Ergonomics | | | | | | | | | | | | | | |
|---|-------------|--|----------------|----------|----------------|---|---|----|-----|--------|---------------|----|-----|-------|
| S.No. | Course Code | Course Name | Specialization | Category | Periods / Week | | | | | Credit | Maximum Marks | | | |
| | | | | | L | T | P | SL | Tot | | C | CA | ES | Total |
| 1. | 24SFE41 | Work Study and Ergonomics | S6 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 2. | 24SFE42 | First Aid and Emergency Procedures | S6 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 3. | 24SFE45 | Industrial Ecology | S6 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 4. | 24SFE46 | Industrial Safety, Health and Environment Acts | S6 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 5. | 24SFE47 | Human Factors Engineering | S6 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |
| 6. | 24SFE48 | Safety In Health Care Management | S6 | PEC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 | |


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MANDATORY COURSE – I, II & III

| S.No. | Course Code | Course Title | Category | Periods / Week | | | | | Credit | Max. Marks | | |
|-------|-------------|--|----------|----------------|---|---|----|-----|--------|------------|----|-----|
| | | | | L | T | P | SL | Tot | | CA | ES | Tot |
| 1. | 24MCP09 | Yoga for Stress Management | MC | 0 | 0 | 0 | 30 | 30 | 0 | - | - | - |
| 2. | 24MCT01 | Constitution of India | MC | 30 | 0 | 0 | 0 | 30 | 0 | 100 | - | 100 |
| 3. | 24MCT02 | Environmental Science and Sustainability | MC | 30 | 0 | 0 | 0 | 30 | 0 | 100 | - | 100 |
| 4. | 24MCT03 | Introduction to Gender Studies | MC | 30 | 0 | 0 | 0 | 30 | 0 | 100 | - | 100 |
| 5. | 24MCT04 | Life Science for Engineers | MC | 30 | 0 | 0 | 0 | 30 | 0 | 100 | - | 100 |
| 6. | 24MCT05 | Industrial Safety | MC | 30 | 0 | 0 | 0 | 30 | 0 | 100 | - | 100 |
| 7. | 24MCT06 | Essence of Indian Knowledge System | MC | 30 | 0 | 0 | 0 | 30 | 0 | 100 | - | 100 |
| 8. | 24MCT07 | Elements of Literature | MC | 30 | 0 | 0 | 0 | 30 | 0 | 100 | - | 100 |
| 9. | 24MCT08 | Disaster Management | MC | 30 | 0 | 0 | 0 | 30 | 0 | 100 | - | 100 |

MANAGEMENT ELECTIVES

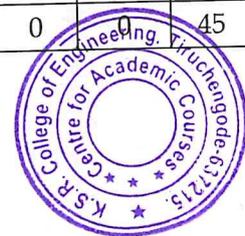
| S.No. | Course Code | Course Title | Category | Periods / Week | | | | | Credit | Max. Marks | | |
|-------|-------------|--|----------|----------------|---|---|----|-----|--------|------------|----|-----|
| | | | | L | T | P | SL | Tot | | CA | ES | Tot |
| 1. | 24MGT01 | Total Quality Management | HSMC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 2. | 24MGT02 | Principles of management | HSMC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 3. | 24MGT03 | Engineering Economics and Financial Accounting | HSMC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 4. | 24MGT04 | Human Resource Management | HSMC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |
| 5. | 24MGT05 | Industrial management | HSMC | 45 | 0 | 0 | 45 | 90 | 3 | 40 | 60 | 100 |


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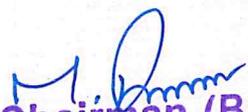


| OPEN ELECTIVES | | | | | | | | |
|----------------|-------------------------|-------------|--|----|---|----|----|--------|
| S. No. | Dept. | Course Code | Course Name | L | T | P | SL | Credit |
| 1. | AUTO | 24AUO01 | Basics of Automobile Engineering , | 45 | 0 | 0 | 45 | 3 |
| 2. | | 24AUO02 | Hybrid Vehicles | 45 | 0 | 0 | 45 | 3 |
| 3. | BME | 24BMO01 | Basics of Biomedical Instrumentation | 45 | 0 | 0 | 45 | 3 |
| 4. | | 24BMO02 | Biometric systems | 45 | 0 | 0 | 45 | 3 |
| 5. | CIVIL | 24CEO01 | Smart Buildings | 45 | 0 | 0 | 45 | 3 |
| 6. | | 24CEO02 | Climate Change | 45 | 0 | 0 | 45 | 3 |
| 7. | CSE | 24CSO01 | Data structures and algorithms using C | 45 | 0 | 30 | 45 | 4 |
| 8. | | 24CSO02 | Fundamentals of Java Programming | 15 | 0 | 90 | 15 | 4 |
| 9. | | 24CSO03 | Full Stack Framework | 45 | 0 | 0 | 45 | 3 |
| 10. | | 24CSO04 | Digital Marketing | 45 | 0 | 0 | 45 | 3 |
| 11. | CSE (Cyber Security) | 24CBO01 | Ethical Hacking | 45 | 0 | 0 | 45 | 3 |
| 12. | | 24CBO02 | Digital and Mobile Forensics | 45 | 0 | 0 | 45 | 3 |
| 13. | | 24CBO03 | Applied Java Programming | 15 | 0 | 90 | 15 | 4 |
| 14. | AIDS | 24CSO06 | Data Science Fundamentals | 45 | 0 | 0 | 45 | 3 |
| 15. | | 24CSO07 | Artificial Intelligence and Machine learning | 45 | 0 | 0 | 45 | 3 |
| 16. | | 24CSO08 | Data Exploration and Visualization | 45 | 0 | 0 | 45 | 3 |
| 17. | IOT | 24IOO01 | Industrial Internet of things | 45 | 0 | 0 | 45 | 3 |
| 18. | | 24IOO02 | Introduction to Sensors and IoT | 45 | 0 | 0 | 45 | 3 |
| 19. | ECE | 24ECO01 | Drone Technology | 45 | 0 | 0 | 45 | 3 |
| 20. | | 24ECO02 | Wearable Devices | 45 | 0 | 0 | 45 | 3 |
| 21. | | 24ECO03 | 5G /6G Communication | 45 | 0 | 0 | 45 | 3 |
| 22. | | 24ECO04 | Embedded IoT | 45 | 0 | 0 | 45 | 3 |
| 23. | EEE | 24EEO01 | Solar and Wind Energy System | 45 | 0 | 0 | 45 | 3 |
| 24. | | 24EEO02 | Hydrogen and Hybrid Energy Storage System | 45 | 0 | 0 | 45 | 3 |
| 25. | | 24EEO03 | Electric Vehicle Technology | 45 | 0 | 0 | 45 | 3 |
| 26. | | 24EEO04 | Energy Conservation and Management | 45 | 0 | 0 | 45 | 3 |
| 27. | IT | 24ITO01 | Introduction to Mobile Application Development | 45 | 0 | 0 | 45 | 3 |
| 28. | | 24ITO02 | Fundamentals of Big Data Analytics | 45 | 0 | 0 | 45 | 3 |
| 29. | | 24ITO03 | Augmented Reality / Virtual Reality(AR/VR) | 45 | 0 | 0 | 45 | 3 |
| 30. | Mech | 24MEO01 | 3D Printing | 45 | 0 | 0 | 45 | 3 |
| 31. | | 24MEO02 | Robotics and Automation | 45 | 0 | 0 | 45 | 3 |
| 32. | | 24MEO03 | Lean Manufacturing | 45 | 0 | 0 | 45 | 3 |
| 33. | SFE | 24SFO01 | Occupational health and safety | 45 | 0 | 0 | 45 | 3 |
| 34. | | 24SFO02 | Electrical safety | 45 | 0 | 0 | 45 | 3 |
| 35. | | 24SFO03 | Building Fire Safety | 45 | 0 | 0 | 45 | 3 |
| 36. | | 24SFO04 | Construction Safety | 45 | 0 | 0 | 45 | 3 |

M. Suman
Chairman (BoS)



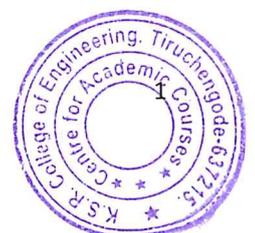
| SUMMARY | | | | | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|---------------|------------|
| Name of the Programme: B.E Safety and fire Engineering | | | | | | | | | | |
| CATEGORY | I | II | III | IV | V | VI | VII | VIII | TOTAL CREDITS | % |
| HSMC | 4 | 2 | - | 3 | - | 3 | 3 | - | 15 | 08.98 |
| BSC | 8 | 8 | 4 | 4 | - | - | - | - | 24 | 14.37 |
| ESC | 2 | 7 | - | - | - | - | - | - | 09 | 05.38 |
| PCC | 7 | 2 | 19 | 16 | 15 | 9 | 7 | - | 75 | 44.91 |
| PEC | - | - | - | - | 6 | 6 | 6 | - | 18 | 10.78 |
| OEC | - | - | - | - | - | - | 3 | - | 3 | 01.80 |
| EEC | 1 | 1 | 1 | 2 | 2 | 4 | 4 | 8 | 23 | 13.77 |
| MC | - | ✓ | - | - | ✓ | ✓ | - | - | - | - |
| Total | 22 | 20 | 24 | 25 | 23 | 22 | 23 | 8 | 167 | 100 |


Chairman (BoS)



| 24ENT19 | PROFESSIONAL COMMUNICATION | Category | L | T | P | SL | C |
|--|--|------------|----|---|---|----|---|
| | | HSMC | 45 | 0 | 0 | 45 | 3 |
| (Common to All Branches) | | | | | | | |
| PRE-REQUISITE: A comprehensive understanding of basic English grammar, vocabulary, and sentence structure with familiarity in Communication and Technical Writing are considered as pre-requisite for the course. | | | | | | | |
| OBJECTIVE: To equip learners with essential verbal and written communication skills, including technical writing, necessary for academic, professional, and workplace success. | | | | | | | |
| UNIT - I | UNDERSTANDING COMPARISONS AND CONTRASTS | (9) | | | | | |
| Reading: Technical brochures, telephone messages, social media messages. Writing: Emails/letters introducing oneself, Compare and Contrast Essay. Grammar: Present Tenses, Framing WH and Yes-No questions. Vocabulary: Portmanteau words, One-word substitutions. | | | | | | | |
| UNIT - II | WRITING REPORTS AND PARAGRAPHS | (9) | | | | | |
| Reading: Technical texts, biographies, travelogues, travel & technical blogs. Writing: Paragraph writing, Short Report on an event/industrial visit. Grammar: Past Tenses, Active & Passive Voice transformations, Prepositions. Vocabulary: Word formations using Prefixes & Suffixes. | | | | | | | |
| UNIT - III | DESCRIBING THE PROCESS/PRODUCT | (9) | | | | | |
| Reading: Advertisements, gadget reviews, user manuals, news reports. Writing: Definitions, Instructions, Product/Process description, Checklists. Grammar: Future Tenses, If clauses, Concord. Vocabulary: Nominal Compounds, Discourse Markers (connectives & sequence words). | | | | | | | |
| UNIT - IV | TRANSCODING AND RECOMMENDATIONS | (9) | | | | | |
| Reading: Newspaper articles, Journal reports. Writing: Recommendations, Transcoding.(Conversion of non-verbal to verbal information) Grammar: Articles, Relative pronouns, Modals. Vocabulary: Collocations, Homonyms. | | | | | | | |
| UNIT - V | SUMMATION AND DESCRIPTION | (9) | | | | | |
| Reading: Editorials and Opinion blogs, Company profiles. Writing: Descriptive/Narrative Essays, Job/Internship Application with Resume. Grammar: Numerical adjectives, Relative Clauses. Vocabulary: Cause & Effect Expressions, Homophones. | | | | | | | |
| TOTAL (T:45 , SL:45) = 90 PERIODS | | | | | | | |

Anurag
Chairman (Bos)



COURSE OUTCOMES:

At the end of the course, the learners will be able to:

| COs | Course Outcome | Cognitive Level |
|-----|--|-----------------|
| CO1 | Recognize the structure of comparison texts using correct tenses and appropriate vocabulary. | Understand |
| CO2 | Construct short paragraphs and reports using past tense and clear expressions. | Understand |
| CO3 | Comprehend processes and products using future forms and appropriate vocabulary. | Understand |
| CO4 | Interpret visuals like charts or graphs to produce well-structured written content. | Understand |
| CO5 | Draft essays and job applications clearly, using proper grammar and structure. | Understand |

TEXT BOOKS:

1. English for Engineers & Technologists, Orient Blackswan Private Ltd. Department of English, Anna University, 2023.
2. Nitin Bhatnagar, Communicative English for Engineers and Professionals, Pearson, 2024.

REFERENCES:

1. Dr. K.N. Shoba, and Dr. Lourdes Joevani, English for Science & Technology-II Cambridge University Press. Francis, Department of English, Anna University, 2023.
2. Lakshminarayanan, A Course Book on Technical English, Scitech Publications (India) Pvt. Ltd.2022.
3. Kulbhusan Kumar, RS Salaria, Effective Communication Skill, Khanna Publishing House, 2023.

| Mapping of COs with POs and PSOs | | | | | | | | | | | | | |
|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| COs/ POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
| CO1 | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - | - |
| CO2 | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - | - |
| CO3 | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - | - |
| CO4 | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - | - |
| CO5 | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - | - |

1-Low, 2-Medium, 3-High


Chairman (BoS)



| 24MET16 | ENGINEERING DRAWING | Category | L | T | P | SL | C |
|--|---|----------|----|---|---|----|-----------|
| | | PCC | 60 | 0 | 0 | 60 | 4 |
| (Common to AE,ME & SFE) | | | | | | | |
| PREREQUISITE: Student must have the basic knowledge of geometry, trigonometry and algebra, along with an introduction to fundamental engineering concepts. | | | | | | | |
| OBJECTIVES: The aim of this course is to help students learn how to draw and understand engineering objects using basic drawing methods. | | | | | | | |
| UNIT - I | PLANE CURVES | | | | | | 12 |
| Introduction on drafting instruments, BIS conventions and specifications, Lettering and Dimensioning- Conics-Construction of ellipse, parabola and hyperbola by eccentricity method -Construction of cycloid-Construction of involutes-Drawing of tangents and normal to the above curves. | | | | | | | |
| UNIT - II | PROJECTION OF POINTS, LINES AND PLANE SURFACES | | | | | | 12 |
| Projection of points and straight lines located in the first quadrant inclined to both the planes - Determination of true lengths and true inclinations - Projection of polygonal surface and circular lamina inclined to any one reference plane. | | | | | | | |
| UNIT - III | PROJECTION OF SOLIDS | | | | | | 12 |
| Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method. | | | | | | | |
| UNIT - IV | SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES | | | | | | 12 |
| Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other- Obtaining true shape of section. Development of lateral surfaces of simple and truncated solids-Prisms, pyramids, cylinders and cones. | | | | | | | |
| UNIT - V | ORTHOGRAPHIC VIEWS AND ISOMETRIC PROJECTIONS | | | | | | 12 |
| Introduction - Free hand sketching of multiple views from pictorial views of objects. Principle of Isometric projection – isometric projection of simple solids and truncated solids of prism, pyramid, cylinder and cone. | | | | | | | |
| L:60,SL:60 TOTAL: 120 PERIODS | | | | | | | |


Chairman (Bos)



COURSE OUTCOMES:

At the end of the course, the students will be able to:

| COs | Course Outcome | Cognitive Level |
|-----|---|-----------------|
| CO1 | Construct various plane curves like ellipse, parabola, cycloid, and involute using standard methods. | Understand |
| CO2 | Develop orthographic projections of points, lines, and plane surfaces inclined to reference planes. | Apply |
| CO3 | Construct projections of simple solids with axes inclined to a plane using change of position method. | Apply |
| CO4 | Develop sectional views and true shapes of surfaces of solids for fabrication. | Apply |
| CO5 | Apply the principles of orthographic and isometric projection to sketch multiple views and isometric representations. | Apply |

TEXT BOOKS:

1. Natarajan, K.V., A text book of Engineering Graphics, Dhanalakshmi Publishers, Chennai, 2020.
2. Kumar, M.S., Engineering Graphics, D.D. Publications, 2019.

REFERENCES:

1. Venugopal & Prabhu Raja, V., Engineering Graphics, New Age International (P) Limited, 2009.
2. Bhatt, N.D., Engineering Drawing, Charotar Publishing House, Fifty Third Edition, 2020.
3. Shah, B., and Rana, B.C., Engineering Drawing, Pearson Education ,2009.
4. Gopalakrishna, K.R., Engineering Drawing (Vol.I & II), Subhas Publications, 2017.
5. Basant Agarwal and Agarwal C.M., Engineering Drawing, Tata McGraw Hill Publishing Company Limited, 2019.

Mapping of COs with POs and PSOs

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

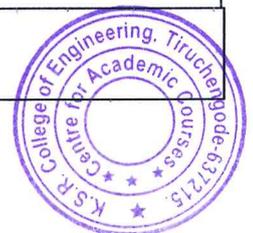
1-low, 2-medium, 3-high


Chairman (BoS)



| 24SFT11 | BASICS OF SAFETY & MECHANICAL ENGINEERING | Category | L | T | P | SL | C |
|---|---|----------|----|---|---|----|------------|
| | | PCC | 45 | 0 | 0 | 45 | 3 |
| SEMSETER I | | | | | | | |
| PREREQUISITE: Prerequisites of foundational knowledge in physics, math, chemistry, and materials. | | | | | | | |
| OBJECTIVES: Objective of basics of safety and mechanical engineering is to create awareness about workplace hazards and promote safe practices to prevent accidents. | | | | | | | |
| UNIT – I | INTRODUCTION | | | | | | (9) |
| Introduction - Safety - Goals of safety engineering. Need for safety. Safety and productivity. Definitions: Accident, Injury, Unsafe act, Unsafe Condition, Dangerous Occurrence, Reportable accidents. Theories of accident causation Safety organization objectives, types, functions, Role of management, supervisors, workmen, unions, government and voluntary agencies in safety. Safety policy. | | | | | | | |
| UNIT – II | SAFETY TRAINING, PPE STANDARD'S | | | | | | (9) |
| Accident prevention Methods - Engineering, Education and Enforcement. Safety Education & Training -Importance, Various training methods, Effectiveness of training, Behavior oriented training. Communication- purpose, barrier to communication. Housekeeping: Responsibility of management and employees. Advantages of good housekeeping. 5S of housekeeping. Work permit system-objectives, hot work and cold work permits. | | | | | | | |
| UNIT – III | PERSONAL PROTECTIVE EQUIPMENT'S CONSTRUCTION | | | | | | (9) |
| Personal protection in the work environment, Types of PPEs, Personal protective equipment respiratory and non-respiratory equipment. Selection of RPE and suitability of RPE for various applications Standards related to PPEs. Monitoring Safety Performance: Frequency rate, severity rate, incidence rate, activity rate. | | | | | | | |
| UNIT – IV | INTERNAL COMBUSTION ENGINES | | | | | | (9) |
| Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines. Working principle of Boilers-Turbines, Reciprocating Pumps (single acting and double acting) and Centrifugal Pumps. | | | | | | | |
| UNIT – V | REFRIGERATION AND AIR CONDITIONING SYSTEM | | | | | | (9) |
| Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system–Layout of typical domestic refrigerator–Window and Split type room Air conditioner. Properties of air – water mixture, concepts of psychometric and its process. | | | | | | | |
| L=45,SL=45,TOTAL: 90 PERIODS | | | | | | | |

M. Dammu
Chairman (BOB)



COURSE OUTCOMES:

At the end of the course, the learners will be able to:

| COs | Course Outcome | Cognitive Level |
|-----|---|-----------------|
| CO1 | Explain the fundamental concepts of safety engineering, accident causation theories, and the roles of key stakeholders in maintaining workplace safety. | Understand |
| CO2 | Explain the significance of accident prevention methods, safety training, and the 5S housekeeping principles in industrial safety. | Understand |
| CO3 | Describe the types, functions, and standards of personal protective equipment (PPE) used in various work environments. | Understand |
| CO4 | Apply knowledge of internal combustion engine cycles to analyze engine performance and suitability for applications. | Apply |
| CO5 | Illustrate the functioning of refrigeration and air conditioning systems and interpret psychometric processes. | Understand |

TEXT BOOKS:

1. G Shanmugam, M S Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education; First edition, 2018
2. Jason Roy, Industrial Hazard Control & Safety Management Study McGraw-Hill Company, 2022.

REFERENCES:

1. David L. Goetsch, Occupational Safety and health, Prentice Hall, 10th (May 2023).
2. Venugopal K. and Prahu Raja V., "Basic Mechanical Engineering", Anuradha Publishers, Kumbakonam, (2000).
3. Willie Hammer, Occupational Safety Management and Engineering, Prentice Hall ,5th edition, June 2000.
4. Benjamin,J., Basic Mechanical Engineering, Pentex Books,9th Edition, 2018

Mapping of COs with POs and PSOs

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

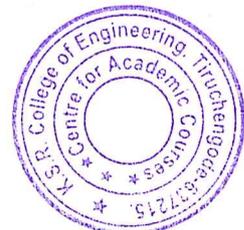
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Chairman (BoS)



| 24GET19 | தமிழர்மரபு | CATEGORY | L | T | P | SL | C |
|--|--|----------|----|---|---|----|------|
| | | HSMC | 15 | 0 | 0 | 15 | 1 |
| (அனைத்து துறைகளுக்கும் பொதுவானது) | | | | | | | |
| முன்கூட்டிய துறைசார் அறிவு: தேவை இல்லை | | | | | | | |
| அலகு - I | மொழி மற்றும் இலக்கியம் | | | | | | [03] |
| இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலயக்கிகியங்கள் - சங்க இலக்கியத்தின் சமயச்சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் அறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ் காப்பியங்கள், தமிழகத்தில் சமணபௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலகியங்கள் தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கியவளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு. | | | | | | | |
| அலகு - II | மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக் கலை | | | | | | [03] |
| நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனியில் திருவள்ளுவர் சிலை - இசை கருவிகள் - மிருதங்கம், பறை. வீணை. யாழ். நாதஸ்வரம் - தமிழர்களின் சமூகபொருளாதார வாழ்வில் கோவில்களின் பங்கு. | | | | | | | |
| அலகு - III | நாட்டுப் புறக் கலைகள் மற்றும் வீர விளையாட்டுக்கள் | | | | | | [03] |
| தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள். | | | | | | | |
| அலகு - IV | தமிழர்களின் திணைக் கோட்பாடுகள் | | | | | | [03] |
| தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றிய அறக்கோட்பாடு - சங்கக்காலத்தில் தமிழகத்தில் எழுத்தறிவும் கல்வியும் - சங்ககால நகரங்களும் துறை முகங்களும் - சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி. | | | | | | | |
| அலகு - V | இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு | | | | | | [03] |
| இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிற்பகுதிகளில் தமிழ் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில் சித்தமருத்துவத்தின் பங்கு கல்வெட்டுகள் கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்கள்களின் அச்ச வரலாறு. | | | | | | | |
| Total (L= 15, SL=15)=30 Periods | | | | | | | |

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| | | |
|---|--|------------------------|
| பாடம் கற்றத்தின் விளைவுகள்: பாடத்தை வெற்றிகரமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள் | | அறிவாற்றல் நிலை |
| CO1: | தமிழ்மொழியின் செந்தன்மை மற்றும் இலக்கியம் குறித்த தெரிதல் | புரிதல் |
| CO2: | தமிழர்களின் சிற்பக்கலை, ஓவியக்கலை மற்றும் இசைக் கருவிகள் குறித்த தெளிவு. | புரிதல் |
| CO3: | தமிழர்களின் நாட்டுப் புரைக் கலைகள் மற்றும் வீரவிளையாட்டுகள் குறித்த தெளிவு | புரிதல் |
| CO4: | தமிழர்களின் திணைக் கோட்பாடுகள், சங்ககாலவணிகம் மற்றும் சோழர்களின் வெற்றிகள் குறித்த தகவல்கள். | புரிதல் |
| CO5: | இந்திய தேசிய இயக்கம், சுயமரியாதை இயக்கம் மற்றும் சித்த மருத்தவம் பற்றிய புரிதல். | புரிதல் |

Text Books:

| | |
|---|--|
| 1 | தமிழகவரலாறு-மக்களும்பண்பாடும்-கேகேபிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்) ,உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை, 2002 |
| 2 | கணினித்தமிழ்முனைவர் இல. சுந்தரம், விகடன் பிரசுரம், 2016 |

Reference Books :

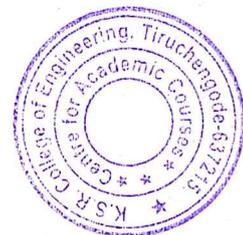
| | |
|---|--|
| 1 | கீழடி-வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம்.(தொல்லியல்துறைவெளியீடு) |
| 2 | பொருளை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு) |
| 3 | Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print) |
| 4 | Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies). |

Mapping of COs with POs and PSOs

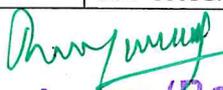
| COs/ POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| CO1 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO2 | - | - | - | - | - | 3 | 3 | - | 2 | - |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

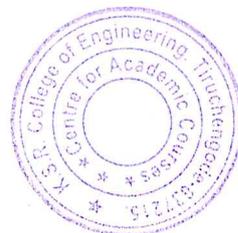
1. சிறிது (குறைந்த) 2. மிதமான (நடுத்தர) 3. கணிசமான (உயர்)

Chairman (BoS)



| | | | | | | | |
|---|---|----------|----|---|---|----|------------------------|
| 24GET19 | HERITAGE OF TAMILS | CATEGORY | L | T | P | SL | C |
| | | HSMC | 15 | 0 | 0 | 15 | 1 |
| (Common to all branches) | | | | | | | |
| <i>Prerequisite(s): No prerequisites are needed for enrolling into the course</i> | | | | | | | |
| UNIT - I | LANGUAGE AND LITERATURE | | | | | | [03] |
| 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 | | | | | | [03] |
| 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, Yash and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils. | | | | | | | |
| UNIT - III | FOLK AND MARTIAL ARTS | | | | | | [03] |
| Therukoothu, Karagattam, VilluPattu, KaniyanKoothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils. | | | | | | | |
| UNIT - IV | THINAI CONCEPT OF TAMILS | | | | | | [03] |
| 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 | | | | | | [03] |
| 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 (L= 15, SL=15) =30 Periods | | | | | | | |
| Course Outcomes: | | | | | | | Cognitive Level |
| At the end of the course, the student will be able to | | | | | | | |
| CO1: | Recognize the extensive literature of Tamil and its classical nature. | | | | | | Understand |
| CO2: | Apprehend the heritage of sculpture, painting and musical instruments of ancient people. | | | | | | Understand |
| CO3: | Review on folk and martial arts of Tamil people. | | | | | | Understand |
| CO4: | Insight thinai concepts, trade and victory of Chozha dynasty. | | | | | | Understand |
| CO5: | Realize the contribution of Tamil in Indian freedom struggle, self-esteem movement and siddha medicine. | | | | | | Understand |


Chairman (BoS)



| Text Books: | |
|------------------|--|
| 1 | Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print) |
| 2 | Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies) |
| Reference Books: | |
| 1 | Social Life of the Tamils – The. Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies). |
| 2 | The Contribution of the Tamil to Indian Culture (Dr.M.Valarmathi) (Puplished by International Institute of Tamil Studies). |
| 3 | Keeladi – ‘Sangam City Civilzation on the banks of river Vaigai; (Jointly Published by: Department of Archaeology & Tamilnadu Text Book and Educational Services Corporation, Tamilnadu) |
| 4 | Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author) |

| Mapping of COs with POs and PSOs | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| COs/ POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
| CO1 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO2 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO3 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO4 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO5 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| Avg. | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| 1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) | | | | | | | | | | | | | |

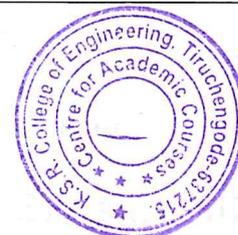
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| 24MAI19 | MATRICES AND CALCULUS | Category | L | T | P | SL | C |
|--|--|------------|----|---|-----|----|---|
| | | BSC | 45 | 0 | 30* | 45 | 4 |
| SEMESTER I - B.E / B.TECH (Common to All Branches) | | | | | | | |
| PREREQUISITE: The Students should have a basic understanding of calculus, matrices, and differential equations to effectively follow the concepts in this course. | | | | | | | |
| OBJECTIVES: Build a strong foundation in eigen values, eigen vectors, quadratic forms, and higher-order linear differential equations. Develop skills in differential and vector calculus to analyze curves, optimize multivariable functions, and interpret vector fields. | | | | | | | |
| UNIT - I | LINEAR ALGEBRA | (9) | | | | | |
| Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values and Eigen vectors (Excluding proof) – Cayley Hamilton theorem (excluding proof) – Quadratic forms – Reduction of quadratic form to canonical form by orthogonal transformation. | | | | | | | |
| UNIT - II | ORDINARY DIFFERENTIAL EQUATIONS | (9) | | | | | |
| Linear differential equations of second and higher order with constant coefficients – Differential equations with variable coefficients – Legendre’s linear differential equations – Method of variation of parameters. | | | | | | | |
| UNIT - III | DIFFERENTIAL CALCULUS | (9) | | | | | |
| Curvature - Radius of curvature (Cartesian co-ordinates only) – Centre of curvature and Circle of curvature – Involutives and Evolutes (Parabola, Ellipse, Hyperbola and Rectangular hyperbola). | | | | | | | |
| UNIT - IV | FUNCTIONS OF SEVERAL VARIABLES | (9) | | | | | |
| Partial derivatives – Taylor’s series expansion – Jacobians - Maxima and Minima for functions of two variables – Method of Lagrangian multipliers. | | | | | | | |
| UNIT - V | VECTOR CALCULUS | (9) | | | | | |
| Gradient, Divergence and Curl – Directional derivative – Irrotational and solenoid vector fields – Green’s theorem in plane, Gauss divergence theorem and Stoke’s theorem (Cube, Cuboid and Rectangular Paralleopiped only). | | | | | | | |
| List of Experiments(R Software): | | | | | | | |
| <ol style="list-style-type: none"> 1. Calculate the characteristic equation and eigen values. 2. Find the eigenvector and diagonalization of a given matrix. 3. Solving ODE with constant coefficients. 4. Detect the solution of ODE with variable coefficients. 5. Identify the radius of curvature. 6. Reckon the Taylor’s series for functions of two variables. 7. Estimate the divergence and curl. | | | | | | | |
| * Alternative weeks : Tutorial and Laboratory | | | | | | | |
| L = 45 , * P = 15 & *T = 15, SL = 45, TOTAL: 120 PERIODS | | | | | | | |

Arumugam

Chairman (BoS)



COURSE OUTCOMES:

At the end of the course, the students will be able to:

| COs | Course Outcome | Cognitive Level |
|-----|--|-----------------|
| CO1 | Apply eigen values, eigen vectors, and the Cayley-Hamilton theorem to solve matrix problems and diagonalize quadratic forms into canonical form. | Apply |
| CO2 | Apply methods to solve second and higher-order linear differential equations with constant and variable coefficients. | Apply |
| CO3 | Apply concepts of differential calculus to find curvature, center of curvature, and evolutes of standard Cartesian conic sections. | Apply |
| CO4 | Apply partial derivatives, Jacobians, and lagrangian multipliers to determine local extremum of multivariable functions. | Apply |
| CO5 | Apply vector differential operators to the vector fields and verify Green's, Gauss divergence, and Stokes' theorems for geometries. | Apply |

TEXT BOOKS:

1. Ravish R Singh and Mukul Bhatt, "Engineering Mathematics – I", Mc-Graw Hill Publications, New Delhi, 2nd Edition, 2020.

2. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 40th Edition, 2020.

REFERENCES:

1. Bali N. P and Manish Goyal, "Engineering Mathematics", Laxmi Publications Pvt Ltd., 7th Edition, 2020.

2. Dass H.K, "Advance Engineering Mathematics", S. Chand and company, 11th Edition, 2014.

3. Jain R.K. and Iyengar S.R.K, "Advanced Engineering Mathematics", Narosa Publications, 8th Edition, 2012.

4. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India, New Delhi, 10th Edition 2016.

5. <https://archive.nptel.ac.in/courses/111/108/111108157/>

Mapping of COs with POs and PSOs

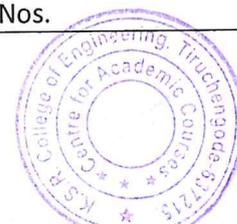
| COs/ POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| CO1 | 3 | 3 | 3 | 3 | 2 | - | - | 1 | - | - | 2 | - | - |
| CO2 | 3 | 3 | 3 | 3 | 2 | - | - | 1 | - | - |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

1-low, 2-medium, 3-high

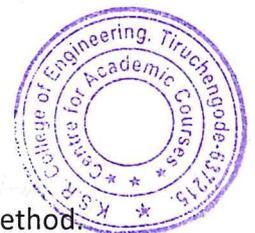
LIST OF EQUIPMENTS (For a Batch of 30 Students)

| S.No. | Name of the Equipments | Quantity |
|-------|--|----------|
| 1. | A computer with Intel (R) Core (TM) i3 – 2130 CPU @ 3.40GHZ processor and 4 GB RAM – DDR3. | 30 Nos. |
| 2. | R software (Open source) | 30 Nos. |

Arjun Kumar
Chairman (BoS)



| 24PHI06 | APPLIED PHYSICS | Category | L | T | P | SL | C |
|---|---|----------|----|---|----|----|------------|
| | | BSc | 45 | - | 30 | 45 | 4 |
| (Common to CE, ME & SFE) | | | | | | | |
| PREREQUISITE: The students must have knowledge about basic concepts of sound, light, arrangement of atoms in crystalline solids, modern engineering materials, magnetic and super conducting materials and their applications. | | | | | | | |
| OBJECTIVES: To provide a comprehensive understanding of the principles, properties and applications of acoustics, ultrasonics, lasers, crystalline structures, new engineering materials, magnetic materials and superconductors in modern Science and technology. | | | | | | | |
| UNIT – I | ACOUSTICS AND ULTRASONICS | | | | | | (9) |
| Acoustics–Introduction – classification of sound – characteristics of musical sound – loudness – Weber – Fechner law – decibel – absorption co-efficient – reverberation – reverberation time – Sabine’s formula: growth and decay (derivation) – factors affecting acoustics of buildings and their remedies. Ultrasonics – production – Piezoelectric method – properties – velocity measurement: acoustical grating – applications – SONAR, NDT – ultrasonic flaw detection technique. | | | | | | | |
| UNIT – II | LASER TECHNOLOGY | | | | | | (9) |
| Introduction – principle of spontaneous emission and stimulated emission – Einstein’s co-efficient A & B(derivation) – population inversion, pumping – types of laser – CO ₂ laser and semiconductor diode laser– homo – junction and hetero – junction (qualitative analysis only) – industrial applications: lasers in welding, heat treatment and cutting – holography (construction and reconstruction of images). | | | | | | | |
| UNIT – III | CRYSTAL PHYSICS | | | | | | (9) |
| Introduction to crystalline and amorphous solids – lattice and unit cell – seven crystal systems and Bravais lattices – atomic radius – co-ordination number – packing factor of SC, BCC, FCC and HCP structures–Miller indices(hkl) – d-spacing in cubic lattice – crystal imperfections – point, line and surface defects. | | | | | | | |
| UNIT – IV | MODERN ENGINEERING MATERIALS | | | | | | (9) |
| New engineering materials: Metallic glasses – preparation, properties and applications – shape memory alloys (SMA) – characteristics, properties of Ni-Ti alloy – applications. Smart materials – smart fluids –Electrorheological fluids (ERF)–Magnetorheological fluids (MRF) – effect of temperature in fluids and its applications. | | | | | | | |
| UNIT - V | MAGNETIC AND SUPERCONDUCTING MATERIALS | | | | | | (9) |
| Magnetic Materials: Introduction – origin of magnetic moment – dia, para and ferromagnetic materials – domain theory of ferro-magnetism – Hysteresis – soft and hard magnetic materials. Superconducting Materials: Introduction to superconductivity – properties and types of superconductor – application of superconductors: magnetic levitation–SQUIDS – cryotron. | | | | | | | |
| List of exercises/experiments: | | | | | | | |
| 1. Calculate the velocity of ultrasonic waves and compressibility of the given liquid using ultrasonic interferometer. | | | | | | | |
| 2. Determine the thickness of the given thin paper using Air wedge method. | | | | | | | |
| 3. Compute the width of the CD groove with a help of semiconductor laser. | | | | | | | |
| 4. Find the band gap of a Germanium/ Silicon crystal. | | | | | | | |
| 5. Evaluate the wavelength of an InP / GaAs crystal laser. | | | | | | | |
| 6. Measure the Young’s modulus of a given beam using non – uniform bending method. | | | | | | | |
| 7. Enumerate the viscosity of a given liquid by Poiseuille’s method. | | | | | | | |
| 8. Assess the Hysteresis loss of magnetic materials using B-H curve. | | | | | | | |
| Lecture: 45, Laboratory: 30, SL:45 TOTAL: 120 PERIODS | | | | | | | |



Dr. R.V.M. RANGARAJAN
CHAIRMAN

KSRCE – Curriculum and Syllabi (R 2024)
K.S.R. COLLEGE OF ENGINEERING
TIRUCHENGODE - 637 215.

Course outcomes:**At the end of the course, the students will be able to:**

| COs | Course Outcome | Cognitive level |
|-----|--|-----------------|
| CO1 | Apply acoustics and ultrasonics principles to determine sound quality in building and implement ultrasonic methods in practical applications. | Apply |
| CO2 | Interpret the laser principles, types and explain specific application based on their desirable requisite. | Understand |
| CO3 | Compute seven crystal systems, interplanar spacing in simple cubic lattice, atomic packing factor for SC, BCC, FCC & HCP and crystal imperfections. | Apply |
| CO4 | Discuss the properties and applications of metallic glasses, SMAs, smart fluids and recognize the behavior of ERF and MRF under temperature effects. | Understand |
| CO5 | Illustrate the principles governing magnetic materials, superconductors, including their classification, properties and applications. | Understand |

Text Books :

1. M.N. Avadhanulu and P.G. Kshirsagar, "A text book of Engineering Physics", S. Chand and Company, New Delhi, 11th Edition, 2018.
2. R.K. Gaur & S.L. Gupta, "Engineering Physics", Dhanpat Rai Publication, New Delhi, 7th Edition, 2014.

Reference Books :

1. R. Murugesan and Kiruthiga Sivaprasath, "Modern Physics", S. Chand & Company, New Delhi, 17th Edition, 2014.
2. V. Rajendran, "Engineering Physics", Tata McGraw-Hill, New Delhi, 1st Edition, 2011.
3. S.O. Pillai, "Solid State Physics", New Age Publication, Chennai, 10th Edition, 2023.
4. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, "Concepts of Modern Physics", McGraw-Hill, New Delhi, 7th Edition, 2015.

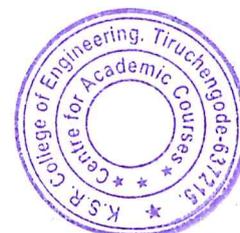
Mapping of COs with POs and PSOs

| COs / POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO 1 | PSO 2 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-------|-------|
| CO1 | 3 | 3 | 2 | - | - | - | 1 | 2 | 2 | - | 2 | - | - |
| CO2 | 3 | 2 | - | - | - | - | 1 | 2 | 2 | - | 2 | - | - |
| CO3 | 3 | 3 | 2 | - | - | - | 1 | 2 | 2 | - | 2 | - | - |
| CO4 | 3 | 2 | - | - | - | - | 1 | 2 | 2 | - | 2 | - | - |
| CO5 | 3 | 2 | - | - | - | - | 1 | 2 | 2 | - | 2 | - | - |
| Avg. | 3 | 2 | - | - | - | - | 1 | 2 | 2 | - | 2 | - | - |

1-low, 2-medium, 3-high



BoS chairman

Chairman (BoS)

24PHI06 - APPLIED PHYSICS
I Year B.E (CE, ME & SFE)
Requirements for a batch of 30 students
Regulation (2024)

| S.No. | Description of Equipment | Quantity required |
|-------|---|-------------------|
| 1. | Ultrasonic interferometer. (with accessories) | 5 Nos |
| 2. | Air wedge apparatus. (with traveling microscope and accessories) | 5 Nos |
| 3. | Width of the groove of CD using laser. (with accessories) | 5 Nos |
| 4. | Band gap apparatus. (with accessories) | 5 Nos |
| 5. | Wavelength of semiconductor laser beam. (with accessories) | 5 Nos |
| 6. | Non- uniform Bending apparatus. (with accessories) | 5 Nos |
| 7. | Poiseuille's method apparatus. (with accessories) | 5 Nos |
| 8. | B-H curve apparatus. (with accessories) | 5 Nos |


BoS chairman

Chairman (BoS)



| | | | | | | | |
|---------|---|----------|---|---|----|----|---|
| 24SFP11 | COMPUTER AIDED GRAPHICS & DRAWING LABORATORY | Category | L | T | P | SL | C |
| | | ESC | 0 | 0 | 30 | 0 | 1 |

SEMSETER I

PREREQUISITE:

Basic knowledge of Engineering Graphics and Fundamentals of Engineering Drawing including understanding of projection methods, orthographic views, isometric drawings and basic geometric constructions. Familiarity with computer operations and general software usage is also essential. Prior exposure to manual drafting tools and visualization skills of 2D and 3D objects will greatly enhance learning outcomes.

OBJECTIVES:

To develop the ability to create 2D engineering drawings using CAD software by understanding basic tools, coordinate systems, and geometric constructions, and to enable students to generate orthographic and sectional views of simple solids and curves with proper dimensioning.

List of Experiments:

1. Study of basic tools, commands and coordinate systems in 2D software.
2. Cycloid and Conic curves.
3. Drawing of curves like spiral, involute using B spine or cubic spine.
4. Orthographic projections of pictorial views.
5. Orthographic views of straight lines.
6. Orthographic views of planes.
7. Orthographic views of simple solids
8. Sectional view and true shape of simple solids
9. Isometric projection of simple solids.
10. Drafting the 2D multiview drawings from 3D model.

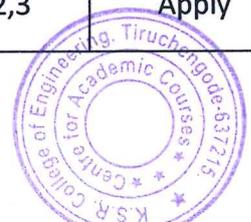
P=30,TOTAL: 30 PERIODS

COURSE OUTCOMES:

At the end of the course, the students will be able to:

| COs | Course Outcome | Exp.No. | Cognitive Level |
|-----|--|---------|-----------------|
| CO1 | Understand and apply basic tools, drawing commands, and coordinate systems in 2D CAD software to create simple shapes. | 1 | Understand |
| CO2 | Apply CAD tools to construct standard curves such as cycloids, conics, spirals, and involutes using spline commands. | 2,3 | Apply |

M. Primm
Chairman (BoS)



| | | | |
|-----|--|-------|------------|
| CO3 | Understand and create orthographic projections of pictorial views, straight lines, and planes. | 4,5,6 | Understand |
| CO4 | Apply orthographic projection of simple solids and sectional view of solids. | 7,8 | Apply |
| CO5 | Understand and draw isometric projection of simple solids and 2D multiview drawing from 3D model | 9,10 | Understand |

REFERENCES:

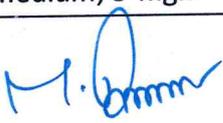
1. Bhatt, N. D. *Engineering Drawing (Plane and Solid Geometry)*, Charotar Publishing House, Fifty-Fifth Edition, 2025, ISBN 978-93-85039-805.

2. Agrawal, Basant & Agrawal, C. M., *Engineering Drawing*, McGraw-Hill Education (India), Third Edition, 2019, ISBN 978-93-5316-744-8.

Mapping of COs with POs and PSOs

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

1-low, 2-medium, 3-high


Chairman (BoS)



| | | | | | | | |
|---------|------------------------------------|----------|---|---|----|----|---|
| 24GEP17 | MANUFACTURING PRACTICES LABORATORY | Category | L | T | P | SL | C |
| | | ESC | 0 | 0 | 30 | 0 | 1 |

(Common to AE, CE, MECH & SFE)

PREREQUISITE:

Students must have a basic knowledge on the topics from Civil works and Mechanical Engineering such as Plumbing, Carpentry, Welding, and Machining and Electrical & Electronics basic components.

OBJECTIVES:

Develop basic practical skills in plumbing, carpentry, welding, machining, sheet metal, and electrical work. Students gain hands-on experience with tools, materials, and techniques used in civil, mechanical, and electrical fields.

List of Exercise/Experiments:

GROUP A (CIVIL) (12)

PLUMBING WORK

1. Preparing plumbing line sketches
2. Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, Elbows and other components which are commonly used in household.

CARPENTRY WORK

3. Sawing and planning work
4. Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

GROUP B (MECHANICAL) (14)

WELDING WORK

5. Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.

BASIC MACHINING WORK

6. Simple Facing and Turning operation using centre lathe.
7. Drilling and Tapping using drilling machine

SHEET METAL WORK

8. Making of a square tray.

GROUP C (ELECTRICAL & ELECTRONICS) (04)

9. Study of Ceiling Fan and Iron Box
10. Study of logic gates AND, OR, EX-OR and NOT.

LIST OF EQUIPMENT (for a batch of 30 Students)

| S.No. | Name of the Equipment | Quantity |
|-------|---|----------|
| 1 | Carpentry tools and its accessories | 15 sets |
| 2 | Plumbing tools and its accessories | 15sets |
| 3 | Arc Welding equipment and its accessories | 5 sets |
| 4 | Centre Lathe with its accessories | 2 No's |
| 5 | Pillar type drilling machine | 1 No |
| 6 | Foundry tools and its accessories | 5 set |


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P:30 TOTAL: 30 PERIODS

COURSE OUTCOMES:

At the end of the course, the students will be able to:

| COs | Course Outcome | Exp. No. | Cognitive Level |
|-----|--|----------|-----------------|
| CO1 | Develop pipe line plan, lay and connect various pipe fittings used in common house hold plumbing work. | 1 & 2 | Apply |
| CO2 | Develop joints in wood materials used in common household wood work | 3 & 4 | Apply |
| CO3 | Construct various joints in steel plates using arc welding work | 5 | Apply |
| CO4 | Apply lathe and drilling machine for turning, drilling, tapping and sheet metal work. | 6, 7 & 8 | Apply |
| CO5 | Illustrate the key components and basic functions of a ceiling fan, iron box and logic gates. | 9 & 10 | Understand |

REFERENCES:

1. Dr. V. Ramesh Babu. Engineering Practices Laboratory Manual, VRB Publishers, Revised Edition 2019-2020.
2. S Gowri & T Jeyapoovan Engineering Practices Lab Manual, Vikas Publishing, 5th Edition.

Mapping of COs with POs and PSOs

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

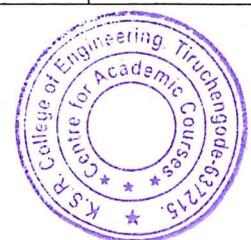
1-low, 2-medium, 3-high


Chairman (BoS)



| | | | | | | | | |
|---|---|--|----------|---|---|----|------------------------|---|
| 24SDP19 | SOFT SKILLS DEVELOPMENT – I | | Category | L | T | P | SL | C |
| | | | EEC | 0 | 0 | 30 | 0 | 1 |
| (Common to All Branches) | | | | | | | | |
| OBJECTIVES: | | | | | | | | |
| To introduce students to the fundamental concepts of aptitude, emphasizing its relevance in academic pursuits and career advancement. It also focuses on developing proficiency in verbal reasoning, which enhances the students' problem-solving abilities and critical thinking skills. | | | | | | | | |
| UNIT - I | NUMBER SYSTEM | | | | | | (6) | |
| Introduction to Number System and its Classification – Divisibility Rules and Problems – Remainder Theorem – HCF & LCM and its properties. | | | | | | | | |
| UNIT - II | NUMBERS | | | | | | (6) | |
| Introduction to Digits, Place value, Face value and Fractions – BODMAS Rule and Simplifications – Unit Digit, Squares and Cubes. | | | | | | | | |
| UNIT - III | AVERAGES | | | | | | (6) | |
| Introduction to Averages, Sum of Observations and Number of Observation – Average of Consecutive Numbers – Weighted Average – Change in Average – Averages in Real-life Scenarios. | | | | | | | | |
| UNIT - IV | LOGICAL REASONING | | | | | | (6) | |
| Analogies – Alphabet Series and Number Series – Directions and Distance. | | | | | | | | |
| UNIT - V | VERBAL ABILITY | | | | | | (6) | |
| Reading Comprehension – Synonyms and Antonyms – Sentence Formation – Paragraph Formation. | | | | | | | | |
| TOTAL: 30 PERIODS | | | | | | | | |
| COURSE OUTCOMES: | | | | | | | | |
| At the end of the course, the students will be able to: | | | | | | | | |
| COs | Course Outcome | | | | | | Cognitive Level | |
| CO1 | Explain the classification of number systems, apply divisibility rules to identify number properties, and understand the concepts of HCF and LCM. | | | | | | Understand | |
| CO2 | Solve problems using face and place value, fractions, BODMAS and number properties. | | | | | | Apply | |
| CO3 | Apply concepts of averages, to analyse and solve real-life and quantitative aptitude problems effectively. | | | | | | Apply | |
| CO4 | Resolve problems with series & direction based logical reasoning. | | | | | | Apply | |
| CO5 | Interpret passages to demonstrate reading comprehension, and explain the structure of correct sentence and paragraph formation. | | | | | | Understand | |


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TEXT BOOKS:

1. R S Aggarwal, "Quantitative Aptitude for Competitive Examinations".
2. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations".
3. Nishit K. Sinha, "Logical Reasoning and Data Interpretation for CAT".
4. R.S. Aggarwal, "A Modern Approach to Verbal & Non-Verbal Reasoning".
5. Edgar Thorpe & Showick Thorpe, "English for Competitive Examinations".

REFERENCES:

1. Arun Sharma, Quantitative Aptitude for CAT, 11e, 2025.
2. Arun Sharma, Logical Reasoning for CAT, 7e, 2025.
3. Wren & Martin, High School English Grammar & Composition.
4. <https://prepinsta.com/>.
5. <https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm>.
6. <https://www.youtube.com/@FeelFreetoLearn/playlists>.

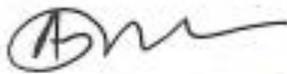
Mapping of COs with POs and PSOs

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


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| 24MET26 | DESIGN THINKING | Category | L | T | P | SL | C |
|--|---|----------|----|---|---|------------|---|
| | | PCC | 30 | 0 | 0 | 30 | 2 |
| PREREQUISITE | | | | | | | |
| Students are expected to have an empathetic mindset to help them understand users, a curious mindset to explore and question assumptions, a collaborative mindset for interdisciplinary teamwork, an iterative approach for refining ideas and creativity to generate innovative solutions | | | | | | | |
| OBJECTIVES: | | | | | | | |
| Understand the concepts and principles of Design Thinking, and recognize the importance of cultivating a Design Mindset. Apply Design Thinking methods and tools at every stage of the problem-solving process. | | | | | | | |
| UNIT - I | FUNDAMENTALS OF DESIGN THINKING | | | | | (6) | |
| What is Design Thinking? - When to use Design Thinking? - How to do it? - Who are involved in this? - Design Thinking™ - Personal Visualization, The Wheel of Life & Balancing Priorities - Appreciating 'Design' - The 3 Laws of Design Thinking. | | | | | | | |
| UNIT - II | STEP 1: THE 'FEEL' STAGE | | | | | (6) | |
| What is this stage about? - What role does a Design Thinker play in this stage? Tools - What is the purpose in this stage? - Persona - Journey Mapping - Stakeholder Mapping & CATWOE Analysis - Cartographic Perspective (L0) - Empathy Map - Case Study: Understanding the Stakeholders | | | | | | | |
| UNIT - III | STEP 2: THE 'DEFINE' STAGE | | | | | (6) | |
| What is this stage about? - What role does a Design Thinker play in this stage? - What is the most important aspect of this stage? - Tools - What is the purpose in this stage? - Five-Whys - Anti-Pattern - Paraphrasing the Problem - Challenge Mapping - LORD: Definitive skill set for a Design Thinker - Case Study: Relooking at the Problem. | | | | | | | |
| UNIT - IV | STEP 3: THE 'DIVERGENCE' & 'CONVERGENCE' STAGE | | | | | (6) | |
| What is this stage about? - What role does a Design Thinker play in this stage? - What is the most important aspect of this stage? - Tools - What is the purpose in this stage? - Brainstorming - Metaphor - Random Association Technique - End-State Visualization - 10gm-100gm-1000gm - Prototyping - Wire framing for digital products - Case Study: Prototyping and Communicating for Effective Outcome. | | | | | | | |
| UNIT - V | STEP 5: THE 'COMMUNICATION' STAGE | | | | | (6) | |
| What is this stage about? - What role does a Design Thinker play in this stage? - What is the most important aspect of this stage? - Tools - What is the purpose in this stage? - The 4Cs Framework - Naming - Packaging - Story boarding - Presentation - Distribution | | | | | | | |
| L:30 SL:30 TOTAL: 60 PERIODS | | | | | | | |


Chairman (BoS)



COURSE OUTCOMES:

At the end of the course, the students will be able to:

| COs | Course Outcome | Cognitive Level |
|-----|---|-----------------|
| CO1 | Demonstrate an understanding of Design Thinking concepts and principles by explaining their relevance in real-world contexts. | Understanding |
| CO2 | Articulate the significance of a Design Mindset and its impact on creative problem-solving. | Understanding |
| CO3 | Apply Design Thinking methods effectively at each stage of the problem-solving process. | Applying |
| CO4 | Identify and implement the phases of Design Thinking to address complex challenges systematically. | Applying |
| CO5 | Use a variety of Design Thinking tools to develop innovative solutions and refine ideas through iteration. | Applying |

TEXT BOOKS:

1. UnMukt – The Science & Art of Design Thinking, Arun Jain
2. Don Norman .The Design of Everyday Things, MIT Press, 2013
3. Tim Brown, Change by Design: How Design Thinking Transforms Organizations and inspires innovation, Harper Collins Publishers Ltd, New York, First Edition, 2009.

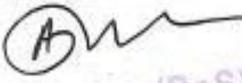
REFERENCES:

1. Chrisitan Mueller-Roterberg, Handbook of Design Thinking – Tips & Tools for how to design thinking, kindle Direct Publishing, First Edition, 2018.
2. Johnny Schneider, Understanding Design Thinking, Lean and Agile, O'Reilly Media, California, First Edition, 2017
3. Roger Martin, The Design of Business. Why Design Thinking is the next competitive advantage, Harvard Business Press, United States, First Edition, 2009.
4. Idris Mootee, Design Thinking for Strategic Innovation, John Wiley & Sons Inc, New Jersey, First Edition, 2013.

Mapping of COs with POs and PSOs

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

1-low, 2-medium, 3-high


Chairman (BoS)



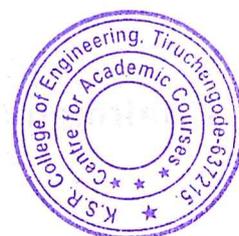
| 24EET06 | BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING | Category | L | T | P | SL | C |
|---|---|------------|----|---|---|----|---|
| | | ESC | 45 | 0 | 0 | 45 | 3 |
| (Common to AE, BME, CSE, CSE (CS), CSD, CSE (IoT), IT, MECH, SFE) | | | | | | | |
| PREREQUISITE: Basic knowledge of calculus, differential equations, and physics (especially electromagnetism) with strong problem-solving skills for circuit analysis. | | | | | | | |
| OBJECTIVE: <ul style="list-style-type: none"> To introduce the fundamentals of electrical and electronic systems, enabling analysis and application of basic circuits, machines and digital components. | | | | | | | |
| UNIT - I | DC AND AC CIRCUITS | (9) | | | | | |
| DC circuits: Electrical quantities – Ohm's law – Kirchhoff's current and voltage laws – Series and parallel resistors – Simple problems. AC circuits: Waveforms, average value, RMS value, form factor, peak factor, power and power factor – Pure R, L and C – Series RL and RC circuits. | | | | | | | |
| UNIT - II | ELECTRICAL MACHINES | (9) | | | | | |
| DC machine: construction, working principle and applications – Single phase induction motor: Capacitor start capacitor run induction motor – Three phase induction motor: construction and working principle – Single phase transformer: construction and working principle. | | | | | | | |
| UNIT - III | ELECTRICAL INSTALLATIONS | (9) | | | | | |
| Classification of wiring system – Earthing – Types: pipe earthing, plate earthing, strip earthing – On-line and Off-line UPS – Lamps: Fluorescent tube, LED. | | | | | | | |
| UNIT - IV | ANALOG ELECTRONICS | (9) | | | | | |
| PN junction diode and Zener diode: Principle of operation and V-I characteristics – Half and full wave rectifier – Bipolar Junction Transistor: Construction and working. | | | | | | | |
| UNIT - V | DIGITAL ELECTRONICS | (9) | | | | | |
| Digital logic gates: NOT, AND, OR, NAND, NOR, EXOR – Digital circuits: half-adder, full-adder, JK and D flip flop – Introduction to Arduino components and IDE. | | | | | | | |
| LECTURE = 45, SELF LEARNING = 45, TOTAL = 90 PERIODS | | | | | | | |
| | | | | | | | |


Chairman (BOS)



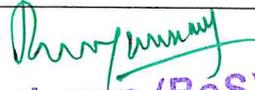
| COURSE OUTCOMES: | | | | | | | | | | | | | | |
|--|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------------------------|------|
| Upon completion of the course, the students will be able to: | | | | | | | | | | | | | | |
| COs | Course Outcome | | | | | | | | | | | | Bloom's Taxonomy Level | |
| CO1 | Interpret the fundamental concepts of electrical circuits to solve the DC and AC circuit problems. | | | | | | | | | | | | Understand | |
| CO2 | Elaborate the construction and working principles of DC machines, induction motors and transformers. | | | | | | | | | | | | Understand | |
| CO3 | Describe the wiring systems, earthing techniques and the functionality of UPS and lighting systems. | | | | | | | | | | | | Understand | |
| CO4 | Identify the operation and characteristics of PN junction, Zener diode and BJT. | | | | | | | | | | | | Understand | |
| CO5 | Illustrate the functionality of digital logic gates, adders, flip-flops and Arduino components. | | | | | | | | | | | | Understand | |
| TEXT BOOKS: | | | | | | | | | | | | | | |
| 1 Kothari D.P and Nagrath I.J, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill, Uttar Pradesh, 2020. | | | | | | | | | | | | | | |
| 2 Bhattacharya S.K, "Basic Electrical and Electronics Engineering", Pearson Education, Delhi, Second Edition, 2017. | | | | | | | | | | | | | | |
| REFERENCES: | | | | | | | | | | | | | | |
| 1 Jain V.K, Amitabh Bajaj, "Design of Electrical Installation", University Science Press, New Delhi, 2016. | | | | | | | | | | | | | | |
| 2 Ramamoorthy M, Chandra Sekhar O, "Electrical Machines", PHI Learning Pvt. Ltd, Delhi, 2018. | | | | | | | | | | | | | | |
| 3 Christopher Siu, "Electronic Devices, Circuits, and Applications", Springer International Publishing, 2022. | | | | | | | | | | | | | | |
| 4 Kothari D.P, Dhillon J.S, "Digital Circuits & Design", First Edition, Pearson, Delhi, 2015. | | | | | | | | | | | | | | |
| Mapping of COs with POs and PSOs | | | | | | | | | | | | | | |
| COs/ POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
| CO1 | 3 | 2 | - | - | - | - | - | - | 1 | 1 | - | 2 | - | - |
| CO2 | 3 | 2 | - | - | - | - | - | - | 1 | 1 | - | 2 | - | - |
| CO3 | 3 | 2 | - | - | - | - | - | - | 1 | 1 | - | 2 | - | - |
| CO4 | 3 | 2 | - | - | - | - | - | - | 1 | 1 | - | 2 | - | - |
| CO5 | 3 | 2 | - | - | - | - | - | - | 1 | 1 | - | 2 | - | - |


Chairman (BoS)



| | | | | | | | |
|--|--|----------|----|---|---|----|------|
| 24GET29 | தமிழரும் தொழில் நுட்பமும் | CATEGORY | L | T | P | SL | C |
| | | HSMC | 15 | 0 | 0 | 15 | 1 |
| (அனைத்து துறைகளுக்கும் பொதுவானது) | | | | | | | |
| முன் கூட்டிய துறைசார் அறிவு : தேவை இல்லை | | | | | | | |
| அலகு - I | நெசவு மற்றும் பாணைத் தொழில்நுட்பம் | | | | | | [03] |
| சங்ககாலத்தில் நெசவுத் தொழில் - பாணைத் தொழில்நுட்பம் கருப்பு சிவப்பு பாண்டங்கள்- பாண்டங்களில் கீறல் குறியீடுகள் | | | | | | | |
| அலகு - II | வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம் | | | | | | [03] |
| சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும்-சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள்-மாமல்லபுரச் சிற்பங்களும், கோவில்களும்- சோழர்காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள்-நாயக்கர் காலக்கோயில்கள்-மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன்ஆலயம் மற்றும் திருமலைநாயக்கர்மஹால் - செட்டிநாட்டுவீடுகள்-பிரிட்டிஷ்காலத்தில் சென்னை இந்தோ-சாரோசெனிக் கட்டிடக்கலை. | | | | | | | |
| அலகு - III | உற்பத்தித் தொழில்நுட்பம் | | | | | | [03] |
| கப்பல் கட்டும் கலை-உலோகவியல்-இரும்புத்தொழிற்சாலை-இரும்பை உருக்குதல், எஃகு- வரலாற்றுச்சான்றுகளாக செம்பு மற்றும் தங்கநாணயங்கள்-நாணயங்கள் அச்சடித்தல்-மணி உருவாக்கும் தொழிற்சாலைகள்-கல் மணிகள்-கண்ணாடி மணிகள்-சுடு மண்மணிகள்- சங்குமணிகள்-எலும்புத்துண்டுகள்-தொல்லியல் சான்றுகள்-சிலப்பதிகாரத்தில் மணிகளின் வகைகள். | | | | | | | |
| அலகு - IV | வேளாண்மை மற்றும் நீர்ப் பாசனத் தொழில்நுட்பம் | | | | | | [03] |
| அணை, ஏரி, குளங்கள், மதகு-சோழர்காலகுமிழித்தாம்பின் முக்கியத்துவம்-கால்நடை பராமரிப்பு- கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள்-வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள்-கடல்சார் அறிவு - மீன் வளம்-முத்து மற்றும் முத்துக் குளித்தல்-பெருங்கடல் குறித்த பண்டைய அறிவு-அறிவுசார் சமூகம். | | | | | | | |
| அலகு - V | அறிவியல் தமிழ் மற்றும் கணினித்தமிழ் | | | | | | [03] |
| அறிவியல் தமிழின் வளர்ச்சி- கணினித்தமிழ் வளர்ச்சி-தமிழ் நூல்களை மின்பதிப்பு செய்தல்- தமிழ் மென் பொருட்கள் உருவாக்கம்-தமிழ் இணையக்கல்விக் கழகம்-தமிழ் மின்நூலகம்- இணையத்தில் தமிழ் அகராதிகள் சொற்குவைத் திட்டம். | | | | | | | |
| Total (L= 15, SL=15) =30 Periods | | | | | | | |

| | | |
|---|--|-----------------|
| பாடம் கற்றத்தின் விளைவுகள் : பாடத்தை வெற்றிகரமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள் | | அறிவாற்றல் நிலை |
| CO1 | சங்ககாலத் தமிழிர்களின் நெசவு மற்றும் பாணைவனைதல் தொழில் நுட்பம் குறித்து கற்றுணர்தல். | புரிதல் |
| CO2 | சங்ககாலத் தமிழிர்களின் கட்டிட தொழில் நுட்பம் கட்டுமான பொருட்கள் மற்றும் அவற்றை விளக்கும் தளங்கள் குறித்து அறிவு. | புரிதல் |
| CO3 | சங்ககாலத் தமிழிர்களின் உலோகத் தொழில், நாணயங்கள் மற்றும் மணிகள் சார்ந்த தொல்லியல் சான்றுகள் பற்றிய அறிவு. | புரிதல் |
| CO4 | சங்ககாலத் தமிழிர்களின் வேளாண்மை, நீர்ப்பாசன முறைகள் மற்றும் முத்து குளித்தல் குறித்த தெளிவு. | புரிதல் |
| CO5 | நவீன அறிவியல் தமிழ் மற்றும் கணினி தமிழ் குறித்த புரிந்துகொள்ளலும் மற்றும் பயன்படுத்தலும். | பகுப்பாய்வு |


Chairman (BoS)

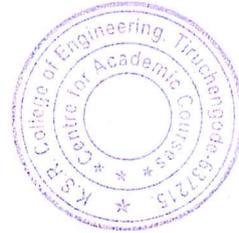


| Text Books : | |
|-------------------|--|
| 1 | தமிழகவரலாறு- மக்களும் பண்பாடும்- கேகேபிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்) |
| 2 | கணினித்தமிழ் - முனைவர் இல. சுந்தரம் (விகடன் பிரசுரம்) |
| Reference Books : | |
| 1 | கீழடி- வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம்.(தொல்லியல் துறை வெளியீடு) |
| 2 | பொருறை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு) |
| 3 | Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by : The Author) |
| 4 | Porunai Civilization (Jointly Published by: Department of Archaeology &Tamilnadu Textbook and Educational Services Corporation, Tamilnadu) |

| Mapping of COs with POs and PSOs | | | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| COs/ POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
| CO1 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO2 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO3 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO4 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO5 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| Avg. | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| 1. சிறிது (குறைந்த) 2. மிதமான (நடுத்தர) 3. கணிசமான (உயர்) | | | | | | | | | | | | | |

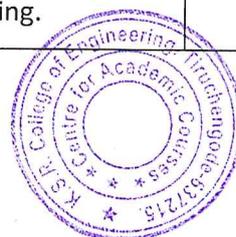
Aravindan

Chairman (BoS)



| | | | | | | | |
|---|---|----------|----|---|---|----|------------------------|
| 24GET29 | TAMILS AND TECHNOLOGY | CATEGORY | L | T | P | SL | C |
| | | HSMC | 15 | 0 | 0 | 15 | 1 |
| (Common to All Branches) | | | | | | | |
| <i>Prerequisite(s): No prerequisites are needed for enrolling into the course</i> | | | | | | | |
| UNIT - I | WEAVING AND CERAMIC TECHNOLOGY | | | | | | [03] |
| Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries. | | | | | | | |
| UNIT - II | DESIGN AND CONSTRUCTION TECHNOLOGY | | | | | | [03] |
| 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) – ThirumalaiNayakar Mahal –Chetti Nādu Houses, Indo –Saracenic architecture at Madras during British Period. | | | | | | | |
| UNIT - III | MANUFACTURING TECHNOLOGY | | | | | | [03] |
| 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 –Shell beads/ bone beats – Archeological evidences – Gem stone types described in Silappathikaram. | | | | | | | |
| UNIT - IV | AGRICULTURE AND IRRIGATION TECHNOLOGY | | | | | | [03] |
| Dam, Tank, ponds, Sluice, Significance of KumizhiThoompu 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 | | | | | | [03] |
| 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 (L= 15, SL=15) =30 Periods | | | | | | | |
| Course Outcomes: | | | | | | | Cognitive Level |
| At the end of the course, the student will be able to | | | | | | | |
| CO1 | Understand the weaving and ceramic technology of ancient Tamil People nature. | | | | | | Understand |
| CO2 | Comprehend the construction technology, building materials in sangam Period and case studies. | | | | | | Understand |
| CO3 | Infer the metal process, coin and beads manufacturing with relevant archeological evidence | | | | | | Understand |
| CO4 | Realize the agriculture methods, irrigation technology and pearl diving. | | | | | | Understand |
| CO5 | Apply the knowledge of scientific Tamil and Tamil computing. | | | | | | Apply |

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| Text Books: | |
|------------------|--|
| 1 | Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print) |
| 2 | Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies). |
| Reference Books: | |
| 1 | Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies) |
| 2 | The Contribution of the Tamils to Indian Culture (Dr.M.Valarmathi)(Puplished by International Institute of Tamil Studies). |
| 3 | Keeladi – ‘Sangam City Civilization on the banks of river Vaigai; (Jointly Published by: Department of Archaeology &Tamilnadu Text Book and Educational Services Corporation, Tamilnadu) |
| 4 | Studies in the History of India with Special Reference to Tamilnadu (dr.K.K.Pillay) (Published by.: The Author) |

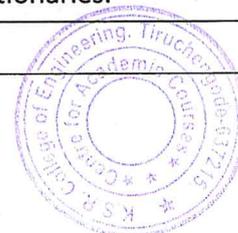
| Mapping of COs with POs and PSOs | | | | | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| COs/ POs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PSO1 | PSO2 |
| CO1 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO2 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO3 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO4 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| CO5 | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| Avg. | - | - | - | - | - | 3 | 3 | - | 2 | - | 3 | - | - |
| 1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) | | | | | | | | | | | | | |


Chairman (BoS)



| 24CB126 | PYTHON PROGRAMMING | Category | L | T | P | SL | C |
|--|---|----------|----|---|----|----|-------------|
| | | PCC | 45 | 0 | 30 | 45 | 4 |
| (Common to ECE, EEE, Mech, Civil, SFE, BME) | | | | | | | |
| PREREQUISITE: Basic knowledge of programming concepts such as variables, data types, and control statements. Logical problem-solving ability and basic mathematical understanding are recommended. | | | | | | | |
| OBJECTIVES: The course helps the students to understand Python basics, write and debug programs, work with functions, files, and data structures, and use exception handling, NumPy, and Pandas for data analysis. | | | | | | | |
| UNIT – I | BASICS OF PYTHON PROGRAMMING | | | | | | (15) |
| Introduction – Python Interpreter – Interactive and Script mode – Values and types – Variables – Operators – Expressions – Statements – Precedence of operators – Multiple assignments – Comments – Input function – Print function – Formatting numbers and strings – Implicit/Explicit type conversion. (Theory-9) | | | | | | | |
| List of Exercise: | | | | | | | |
| <ol style="list-style-type: none"> 1. Write a Python program to demonstrate values, types, variables, operators, expressions, multiple assignments, and operator precedence. 2. Develop a Python program to read user input and display formatted output using format () and f- strings. 3. Construct a Python program to perform implicit and explicit type conversion and demonstrate comments. (Laboratory-6) | | | | | | | |
| UNIT – II | CONTROL STATEMENTS AND STRINGS | | | | | | (15) |
| Conditional (if), alternative (if-else), chained conditional (if-elif-else). Iteration-while, for, infinite loop, break, continue, pass, else. Strings-String slices, immutability, string methods and operations. (Theory-9) | | | | | | | |
| List of Exercise: | | | | | | | |
| <ol style="list-style-type: none"> 1. Construct a Python program using conditional statements (if, if-else, if-elif-else). 2. Develop a Python program demonstrating loop control statements using for, while, break, continue, pass, and infinite loop. 3. Write a Python program to perform string slicing, demonstrate immutability, and apply string methods. (Laboratory-6) | | | | | | | |
| UNIT – III | FUNCTIONS AND FILES | | | | | | (15) |
| Functions – Introduction – Inbuilt functions – User-defined functions – Passing parameters: positional, default, keyword arguments – Return values – Local and global scope – Recursion – Lambda functions. Files – Text files – Reading and writing files. (Theory-9) | | | | | | | |
| List of Exercise: | | | | | | | |
| <ol style="list-style-type: none"> 1. Write a Python program demonstrating positional, keyword, and default arguments with return values. 2. Construct a Python program using recursion and lambda functions. 3. Develop a Python program to create, write, and read text files. (Laboratory-6) | | | | | | | |
| UNIT – IV | DATA STRUCTURES: LISTS, TUPLES, SETS, DICTIONARIES | | | | | | (15) |
| Lists – Creating lists – List operations – List methods – Mutability – List functions – Searching and sorting. Tuples – Tuple assignment – Operations on tuples – Lists and tuples – Tuple as return value. Sets – Creating sets – Set operations. Dictionaries – Operations and methods – Nested dictionaries. (Theory-9) | | | | | | | |
| List of Exercise: | | | | | | | |
| <ol style="list-style-type: none"> 1. Write a Python program to create and manipulate lists including searching and sorting. 2. Develop a Python program to demonstrate set and tuple operations. 3. Construct a Python program using dictionaries and nested dictionaries. (Laboratory-6) | | | | | | | |
| UNIT – V | EXCEPTIONS HANDLING, NUMPY AND PANDAS | | | | | | (15) |


Chairman (BoS)



Exceptions – Errors and Exceptions – Handling exception – Built-in and User-defined exceptions. NumPy – Introduction – Computations using NumPy functions – Computation on arrays – Aggregation – Indexing and Sorting. Pandas – Introduction and Basic concepts – DataFrames – Data handling. **(Theory-9)**

List of Exercise:

1. Write a Python program to demonstrate exception handling including built-in and user-defined exceptions.
2. Develop a Python program using NumPy to perform computations, aggregations, indexing, and sorting.
3. Apply Pandas DataFrame operations to create, update, filter, and describe datasets.

(Laboratory-6)

COURSE OUTCOMES:

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

| Course Outcome | Description | Bloom's Taxonomy |
|----------------|---|------------------|
| CO1 | Illustrate fundamental Python programming constructs such as variables, operators, expressions, and control statements. | Understand |
| CO2 | Demonstrate Python conditional statements, loops, and string operations for basic program logic. | Apply |
| CO3 | Develop Python programs using functions, recursion, and file handling concepts. | Apply |
| CO4 | Apply Python data structures including lists, sets, tuples, and dictionaries to solve problems. | Apply |
| CO5 | Use to exception handling and perform data manipulation NumPy and Pandas. | Apply |

TEXT BOOKS:

| | |
|---|--|
| 1 | Eric Matthes, "Python Crash Course: A Hands-On, Project-Based Introduction to Programming", No Starch Press, 3rd Edition, 2025 |
| 2 | Reema Thareja, "Python Programming Using Problem Solving Approach", Oxford University Press, 3rd Edition, 2025 |

REFERENCES:

| | |
|---|---|
| 1 | Wes McKinney, "Python for Data Analysis: Data Wrangling with pandas, NumPy, and Jupyter", O'Reilly Media, 3rd Edition, 2022 |
| 2 | Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", Green Tea Press, 2nd Edition, 2016 |
| 3 | Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Interdisciplinary Approach", Pearson Education / Addison-Wesley Professional, 1st Edition, 2016 |
| 4 | David Beazley & Brian K. Jones, "Python Cookbook: Recipes for Mastering Python 3", O'Reilly Media, 3rd Edition, 2024 |
| 5 | Luciano Ramalho, "Fluent Python: Clear, Concise, and Effective Programming", O'Reilly Media, 2nd Edition, 2022 |

Mapping of COs with POs and PSOs

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

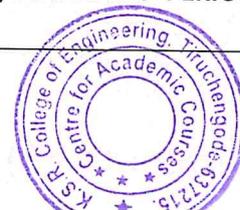
1 - low, 2 - medium, 3 - high, '-' - no correlation


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| 24MAI29 | PROBABILITY AND STATISTICS | Category | L | T | P | SL | C |
|---|---|----------|----|---|-----|----|------------|
| | | BSC | 45 | 0 | 30* | 45 | 4 |
| SEMESTER II - B.E / B.TECH (Common to All Branches) | | | | | | | |
| PREREQUISITE: A basic understanding of algebra, calculus, and introductory statistics is required to grasp the concepts of probability, hypothesis testing, and statistical methods used in engineering and quality control. | | | | | | | |
| OBJECTIVES: To build a foundational understanding of probability and random variables, enable the application of two-dimensional random variables in engineering contexts, develop the ability to perform hypothesis testing for both small and large samples, introduce the principles of experimental design in agricultural studies, and provide knowledge of statistical quality control techniques. | | | | | | | |
| UNIT - I | ONE DIMENSIONAL RANDOM VARIABLES | | | | | | (9) |
| One dimensional Random Variable - Discrete and continuous random Variables -Expectations - Moment generating functions and their properties - Binomial, Poisson, Uniform and Normal distributions. | | | | | | | |
| UNIT - II | TWO - DIMENSIONAL RANDOM VARIABLES | | | | | | (9) |
| Joint distributions – Marginal and conditional distributions – Covariance – Karl Pearson's Coefficient of Correlation - Spearman's Rank Correlation - Regression Analysis. | | | | | | | |
| UNIT - III | TESTING OF HYPOTHESIS | | | | | | (9) |
| One sample and two sample test for means of large samples (Z- test), One sample and two sample test for means of small samples (t-test), Chi-square - Independent of Attributes - F test for equality of variances. | | | | | | | |
| UNIT - IV | DESIGN OF EXPERIMENTS | | | | | | (9) |
| Analysis of variance - One way and two way classifications - Completely Randomized Design - Randomized Block Design - Latin Square Design. | | | | | | | |
| UNIT - V | STATISTICAL QUALITY CONTROL | | | | | | (9) |
| Control charts for measurements \bar{X} and R charts – Control charts for C and P charts. | | | | | | | |
| List of Experiments (R Software): | | | | | | | |
| <ol style="list-style-type: none"> 1. Determine the probability by using binomial distribution. 2. Find the probability with the help of normal distribution. 3. Determine the correlation co-efficient between X and Y. 4. Examine the small samples using F distribution. 5. Inspect the data using Latin Square Design (LSD). 6. Find the \bar{X} Charts. 7. Compute the R Charts. | | | | | | | |
| * Alternative weeks : Tutorial and Laboratory | | | | | | | |
| L = 45 , * P = 15 & *T = 15, SL = 45, TOTAL: 120 PERIODS | | | | | | | |

Aravind Kumar
Chairman (BoS)

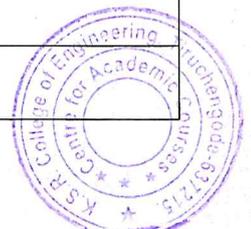


| COURSE OUTCOMES: At the end of the course, the students will be able to: | | | | | | | | | | | | | |
|---|---|-----|-----|-----|------|------|-----|-----|-------------|------|------|-----------------|------|
| COs | Course Outcome | | | | | | | | | | | Cognitive Level | |
| CO1 | Apply the concepts of one dimensional random variables to compute expectations and analyze the standard distributions. | | | | | | | | | | | Apply | |
| CO2 | Apply statistical methods to compute marginal and conditional distributions, and perform correlation and regression analysis. | | | | | | | | | | | Apply | |
| CO3 | Apply Z-test, t-test, Chi-square test, and F-test to analyze sample data and draw inferences on independence of attributes. | | | | | | | | | | | Apply | |
| CO4 | Apply analysis of variance techniques for one-way and two-way classifications, and implement experimental designs using CRD, RBD and LSD. | | | | | | | | | | | Apply | |
| CO5 | Construct control charts for measurements Mean and Range charts and attributes charts to assess process control and product quality. | | | | | | | | | | | Apply | |
| TEXT BOOKS: | | | | | | | | | | | | | |
| 1. S.P. Gupta, "Statistical Methods", Sulthan Chand & Sons, 46 th Edition, 2021. | | | | | | | | | | | | | |
| 2. Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4 th edition, 2007. | | | | | | | | | | | | | |
| REFERENCES: | | | | | | | | | | | | | |
| 1. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8 th Edition, 2014. | | | | | | | | | | | | | |
| 2. Spiegel. M.R., Schiller. J. and Srinivasan, R.A., "Schaum's Outline of Theory and Problems of Probability and Statistics", Tata McGraw Hill Edition, 2004. | | | | | | | | | | | | | |
| 3. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", Pearson Education, Asia, 9 th Edition, 2010. | | | | | | | | | | | | | |
| 4. R.C.Gupta, "Statistical Quality Controls", Khanna Publishers, Delhi, 8 th Edition , 2008. | | | | | | | | | | | | | |
| Mapping of COs with POs and PSOs | | | | | | | | | | | | | |
| COs/ POs | PO1 | PO2 | PO3 | PO4 | PO 5 | PO 6 | PO7 | PO8 | P O 9 | PO10 | PO11 | PSO1 | PSO2 |
| CO1 | 3 | 3 | 3 | 3 | 2 | - | - | 1 | - | - | 2 | - | - |
| CO2 | 3 | 3 | 3 | 3 | 2 | - | - | 1 | - | - | 2 | - | - |
| CO3 | 3 | 3 | 3 | 3 | 2 | - | - | 1 | - | - | 2 | - | - |
| CO4 | 3 | 3 | 3 | 3 | 2 | - | - | 1 | - | - | 2 | - | - |
| CO5 | 3 | 3 | 3 | 3 | 2 | - | - | 1 | - | - | 2 | - | - |
| Avg. | 3 | 3 | 3 | 3 | 2 | - | - | 1 | - | - | 2 | - | - |
| 1-low, 2-medium, 3-high | | | | | | | | | | | | | |

LIST OF EQUIPMENTS (For a Batch of 30 Students)

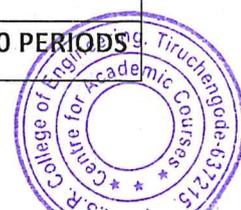
| S.No. | Name of the Equipments | Quantity |
|-------|--|----------|
| 1. | A computer with Intel (R) Core (TM) i3 – 2130 CPU @ 3.40GHZ processor and 4 GB RAM – DDR3. | 30 Nos. |
| | R software (Open source) | 30 Nos. |

Chairman (BoS)



| 24CHI07 | APPLIED CHEMISTRY | Category | L | T | P | SL | C |
|---|---------------------------------------|----------|----|---|----|----|------------|
| | | BSC | 45 | 0 | 30 | 45 | 4 |
| (Common to AE, CE, MECH and SFE) | | | | | | | |
| PREREQUISITE The students must have knowledge about the basic concepts of water parameters, electro chemistry, organic reactions and their applications. | | | | | | | |
| OBJECTIVES: To equip the learners to apply the chemical principles and their applications in the engineering fields. | | | | | | | |
| UNIT - I | WATER TREATMENT | | | | | | (9) |
| Hardness – types, units – estimation of hardness by EDTA method; Boiler feed water – requirements, disadvantages of using hard water in boilers – scale and sludge – priming and foaming – caustic embrittlement – boiler corrosion. Softening methods – internal conditioning – calgon, phosphate – external conditioning – zeolite process and ion exchange process; Desalination – reverse osmosis. Domestic water treatment (Sterilisation process Only). | | | | | | | |
| UNIT - II | ELECTROCHEMISTRY AND CORROSION | | | | | | (9) |
| Introduction – electrode potential – Nernst equation – EMF series and its significance; E – Vehicles - Need - Types – Advantages and Disadvantages; Corrosion – causes, consequences – classification – chemical corrosion – electro chemical corrosion – mechanism; Galvanic & differential aeration corrosion – factors influencing corrosion – corrosion control (Sacrificial anode and Impressed Current Cathodic protection method). | | | | | | | |
| UNIT - III | ENERGY STORAGE DEVICES | | | | | | (9) |
| Batteries – primary battery – Dry cell, secondary batteries – lead-acid and lithium-ion batteries. Fuel cells – H ₂ -O ₂ fuel cell, solar cells – principle, applications and advantages; Nuclear energy: Light water Nuclear power plant - breeder reactor. | | | | | | | |
| UNIT - IV | PHASE RULE & LUBRICANTS | | | | | | (9) |
| Phase rule: Introduction, definition of terms with examples. One component system – water system; Reduced phase rule; Two component system: lead-silver system. Lubricants – definition – function – characteristics – properties – viscosity index, flash and fire points, cloud and pour points, oiliness; Solid lubricants – graphite and MoS ₂ . | | | | | | | |
| UNIT - V | ADVANCED ENGINEERING MATERIALS | | | | | | (9) |
| Abrasives – Moh's scale of hardness – types – natural [Diamond] – synthetic [SiC]; Refractories – characteristics – classifications [Acidic, basic and neutral refractories] – properties – refractoriness – RUL – porosity – thermal spalling; Nano materials – CNT– synthesis [CVD, laser evaporation, pyrolysis] – applications of nano materials. | | | | | | | |
| List of Exercise/Experiments: | | | | | | | |
| 1. Estimation of total, permanent and temporary hardness of water sample By EDTA method | | | | | | | |
| 2. Estimation of chloride content in water by Argentometric method [Mohr's Method] | | | | | | | |
| 3. Conductometric titration of strong acid with strong base (HCl Vs NaOH) | | | | | | | |
| 4. Estimation of dissolved oxygen in water (Winkler's Method) | | | | | | | |
| 5. Conductometric titration of mixture of acids (HCl & CH ₃ COOH) with strong base | | | | | | | |
| 6. Estimation of Fe ²⁺ ion by potentiometric titration | | | | | | | |
| 7. Estimation of HCl by p ^H - Metry | | | | | | | |
| 8. Conductometric precipitation titration using BaCl ₂ -Na ₂ SO ₄ | | | | | | | |
| L = 45, P = 30, SL = 45, TOTAL = 120 PERIODS | | | | | | | |

[Signature]
Chairman (BOS)



COURSE OUTCOMES:

At the end of the course, the students will be able to:

| COs | Course Outcome | Cognitive Level |
|-----|--|-----------------|
| CO1 | Interpret the treatment solutions for drinking water, boiler feed water, and wastewater reuse. | Understand |
| CO2 | Describe different types of electrochemical cells, including galvanic and electrolytic cells. | Understand |
| CO3 | Categorize different energy storage methods, such batteries, fuel cell and solar cell for the production of electricity. | Understand |
| CO4 | Choose the Engineering materials through the concept of phase rule and lubricants. | Understand |
| CO5 | Classify the manufacturing processes of advanced engineering materials and its uses. | Understand |

TEXT BOOKS:

1. S S. Dara and S. S. Umare, "A Text book of Engineering Chemistry", S.Chand & Co.Ltd., 12th Edition, 2015.
2. P.C. Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Pub. Co., 16th Edition, 2013.
3. Wiley, "Engineering Chemistry", Wiley India Pvt. Ltd., 2nd Edition, 2013.

REFERENCES:

1. Dr. A. Ravikrishnan, "Engineering Chemistry", Srikrishna Hi-tech Publishing Company Pvt. Ltd., 21st Edition, 2022.
2. J. Mendham, R. C. Denney, J. D. Barnes, M. J. K. Thomas and B. Sivasankar, "Vogel's Text book of Quantitative Chemical Analysis", Pearson Education Pvt., Ltd., 6th Edition, 2019.
3. Shashi Chala, "A Text book of Engineering Chemistry", Dhanpat Rai Pub. Co., 2015.
4. S. K. Bhasin and Sudha Rani, "Laboratory Manual of Engineering Chemistry", Dhanpat Rai Publishing Company Private Limited, 3rd Edition, 2012.

Mapping of COs with POs and PSOs

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

1-low, 2-medium, 3-high

Laboratory Equipment Details
(Requirements for a batch of 30 students)

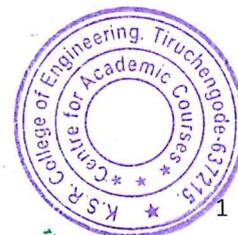
| S.No. | Description of Equipment | Quantity required |
|-------|--------------------------|-------------------|
| 1. | Electronic balance | 1 No. |
| 2. | pH meter | 6 Nos. |
| 3. | Conductivity meter | 6 Nos. |
| 4. | Potentiometer | 6 Nos. |

[Signature]
Chairman (BoS)



| 24ENP29 | PROFESSIONAL COMMUNICATION LABORATORY | Category | L | T | P | SL | C | |
|--|---------------------------------------|----------|---|---|----|----|---|------------|
| | | HSMC | 0 | 0 | 30 | 0 | 1 | |
| (Common to All Branches) | | | | | | | | |
| OBJECTIVE: To enhance learners' proficiency in listening, speaking, reading, and writing through structured activities and professional communication practices relevant to academic and workplace settings. | | | | | | | | |
| UNIT - I | VERBAL AND CRITICAL REASONING | | | | | | | (6) |
| Syllogism – Drawing conclusions from given logical statements, Assertion and Reason – Judging the link between a claim and its reason, Verbal Analogies – Completing word pairs based on relationships, Statement and Assumption – Identifying hidden assumptions in statements, Statement and Conclusion – Choosing valid conclusions from given data, Critical Reasoning – Evaluating arguments for logic and consistency. | | | | | | | | |
| UNIT - II | LISTENING | | | | | | | (6) |
| Listening to Announcement – Understanding key details and context from public messages, Short Conversation – Extracting specific information from brief dialogues, Motivational Speech – Grasping main ideas, tone, and speaker's intent, Telephone Conversation – Comprehending spoken exchanges over the phone. | | | | | | | | |
| UNIT - III | SPEAKING | | | | | | | (6) |
| Talking about Oneself – Sharing personal details clearly and confidently, Oral-presentation on a General Topic – Presenting ideas briefly with clarity and structure, Group Discussion on Current Affairs – Expressing and support opinions in group settings, Role Play – Performing situational conversations using appropriate language, Mock & HR Interview – Answering common interview questions with clarity and confidence. | | | | | | | | |
| UNIT - IV | READING | | | | | | | (6) |
| Reading Short Texts – Understanding the main message and key ideas, Reading for General and Specific Information – Locating relevant details in various texts, Case Studies on Problem Solving – Analyzing real-life scenarios to identify issues and solutions. | | | | | | | | |
| UNIT - V | WRITING | | | | | | | (6) |
| Written communication: Letters (Apology & Complaint) – Writing formal letters using appropriate tone and structure, E-mails (Appreciation & Permission) – Composing clear and courteous emails, Technical Report – Using standard format for preparing structured technical report, Agenda / Minutes – Preparing format for meeting agendas and recording minutes. | | | | | | | | |
| TOTAL (P:30) = 30 PERIODS | | | | | | | | |

Shreyas
Chairman (BoS)



List of Experiments:

1. Syllogism, Assertion & Reason and Verbal Analogies
2. Statement & Assumption, Statement & Conclusion and Critical Reasoning
3. Listening: Announcement and Short Conversation
4. Listening: Motivational Speech and Telephone Conversation
5. Speaking: Taking about oneself, Mock & HR Interview and Mini-presentation
6. Speaking: Group Discussion and Role Play
7. Reading: Multiple Choice & Fill in the Blanks
8. Reading: Analyzing Case Studies on Problem Solving
9. Writing: Complaint/Apology Letter and Appreciation/Permission Email
10. Writing: Format of Technical Report and Format of Agenda/Minutes

COURSE OUTCOMES:

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

| COs | Description | Ex. No. | Cognitive Level |
|-----|--|---------|-----------------|
| CO1 | Comprehend assumptions and draw conclusions from verbal reasoning tasks. | 1 & 2 | Understand |
| CO2 | Understand spoken texts to identify key points and the speaker's intent. | 3 & 4 | Understand |
| CO3 | Use appropriate language and tone in personal, group, and interview conversations. | 5 & 6 | Understand |
| CO4 | Recognize main ideas and supporting points in short texts and case studies. | 7 & 8 | Understand |
| CO5 | Draft formal letters, emails, reports, and meeting notes in the correct format. | 9 & 10 | Understand |

TEXT BOOKS:

1. Bhatnagar Nitin, Communicative English for Engineers and Professionals, Pearson India, 2010.
2. Kulbhusan Kumar, RS Salaria, Effective Communication Skill, Khanna Publishing House, 2018.

REFERENCES:

1. Jack C Richards, Interchange, Cambridge University Press, 2022.
2. RS Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, S Chand, 2024.

Mapping of COs with POs and PSOs

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

1-Low, 2-Medium, 3-High

Anurag
Chairman (BoS)



Lab Requirement for a batch of 30 Students

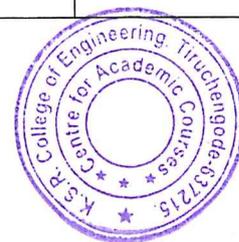
| Sl. No. | Description of Equipment / Software | Quantity required |
|---------|---|-------------------|
| 1. | Server | 1 |
| | Intel core i3 - 2120 | |
| | 4 GB RAM / 240 GB SSD | |
| | OS: Windows 2011 | |
| | Headphones with mike | |
| 2. | Client Systems | 30 |
| | Intel core i3 - 2120 | |
| | 4 GB RAM / 240 GB SSD | |
| | OS: Windows 2011 | |
| | Headphones with mike | |
| 3. | Software | 1 |
| | a) Interactive Teacher control software | |
| | b) English Language Lab Software | |
| | c) Career Lab Software | |

Murugan
Chairman (BoS)



| | | | | | | | |
|--|--|----------|---|---|----|------------------------|-----|
| 24SDP29 | SOFT SKILLS DEVELOPMENT – II | Category | L | T | P | SL | C |
| | | EEC | 0 | 0 | 30 | 0 | 1 |
| (Common to All Branches) | | | | | | | |
| OBJECTIVES: To introduce students to the basics of aptitude, helping them understand its core concepts and real-world applications. A key focus is placed on developing proficiency in verbal reasoning, which supports improved problem-solving and analytical thinking. Additionally, the course works toward building a strong foundation in English grammar to enhance language accuracy and communication skills. | | | | | | | |
| UNIT - I | PERCENTAGE | | | | | | (6) |
| Concept of Percentage – Successive Percentage – Increasing and Decreasing Percentage – Population – Depreciation. | | | | | | | |
| UNIT - II | PROFIT AND LOSS | | | | | | (6) |
| Concepts of Cost Price, Selling Price, Profit and Loss – Profit Percentage – Loss Percentage – Problems on Dishonest Seller. | | | | | | | |
| UNIT - III | RATIO PROPORTIONS AND PARTNERSHIP | | | | | | (6) |
| Introduction and Ratio Calculation – Mean Proportion – Share Calculation Based on Ratio – Ages – Partnership. | | | | | | | |
| UNIT - IV | LOGICAL REASONING | | | | | | (6) |
| Coding and Decoding – Blood Relations – Ranking and Ordering. | | | | | | | |
| UNIT - V | VERBAL ABILITY | | | | | | (6) |
| Sentence Improvement – Ordering of Sentence – Cloze Test – Spellings. | | | | | | | |
| TOTAL: 30 PERIODS | | | | | | | |
| COURSE OUTCOMES: At the end of the course, the students will be able to: | | | | | | | |
| COs | Course Outcome | | | | | Cognitive Level | |
| CO1 | Apply percentage concepts to solve problems on growth, depreciation, and population change effectively. | | | | | Apply | |
| CO2 | Apply concepts of profit, loss, and pricing to analyse transactions, including cases of dishonest selling. | | | | | Apply | |
| CO3 | Demonstrate proficiency in applying ratio, proportion, and partnership principles | | | | | Apply | |
| CO4 | Solve the problems on coding-decoding, blood relations, and ranking using logical reasoning techniques | | | | | Apply | |
| CO5 | Improve the sentence structure, logical sequencing, contextual understanding, and spelling accuracy for effective communication. | | | | | Understand | |


Chairman (BoS)



TEXT BOOKS:

1. R S Aggarwal, "Quantitative Aptitude for Competitive Examinations".
2. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations".
3. Nishit K. Sinha, "Logical Reasoning and Data Interpretation for CAT".
4. R.S. Agarwal, "A Modern Approach to Verbal & Non-Verbal Reasoning".
5. Edgar Thorpe & Showick Thorpe, "English for Competitive Examinations".

REFERENCES:

1. Arun Sharma, Quantitative Aptitude for CAT, 11e, 2025.
2. Arun Sharma, Logical Reasoning for CAT, 7e, 2025.
3. Wren & Martin, High School English Grammar & Composition.
4. <https://prepinsta.com/>.
5. <https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm>.
6. <https://www.youtube.com/@FeelFreetoLearn/playlists>.

Mapping of COs with POs and PSOs

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


Chairman (BoS)

