

**KGISL INSTITUTE OF TECHNOLOGY: COIMBATORE – 641 035**  
**REGULATIONS 2024 (for students admitted from AY2024-25)**  
**CHOICE BASED CREDIT SYSTEM**  
**B.E. MECHANICAL ENGINEERING**  
**CURRICULUM FOR SEMESTERS I - VIII**

**OVERVIEW OF CREDITS**

| SEMESTER             | HSMC         | BSC           | ESC           | PCC           | PEC          | OEC          | EEC         | TOTAL        |
|----------------------|--------------|---------------|---------------|---------------|--------------|--------------|-------------|--------------|
| I                    | 4            | 10            | 9             |               |              |              |             | 23           |
| II                   | 4            | 9             | 9             |               |              |              | 3           | 25           |
| III                  |              | 4             |               | 20            |              |              | 2           | 26           |
| IV                   |              | 4             |               | 15            |              |              | 6           | 25           |
| V                    | 2            |               |               | 12            | 6            |              | 3           | 23           |
| VI                   |              |               |               | 7             | 9            | 3            | 4           | 23           |
| VII                  | 3            |               |               | 3             |              | 3            | 6           | 15           |
| VIII                 |              |               |               |               |              |              | 10          | 10           |
| <b>TOTAL</b>         | <b>13</b>    | <b>27</b>     | <b>18</b>     | <b>57</b>     | <b>15</b>    | <b>6</b>     | <b>34</b>   | <b>170</b>   |
| <b>% OF CATEGORY</b> | <b>7.6 %</b> | <b>15.9 %</b> | <b>10.6 %</b> | <b>33.5 %</b> | <b>8.8 %</b> | <b>3.5 %</b> | <b>20 %</b> | <b>100 %</b> |

**CATEGORY OF COURSES**

|             |                                          |            |                                  |
|-------------|------------------------------------------|------------|----------------------------------|
| <b>HSMC</b> | Humanities Science and Management Course | <b>PEC</b> | Professional Elective Course     |
| <b>BSC</b>  | Basic Science Course                     | <b>OEC</b> | Open Elective Course             |
| <b>ESC</b>  | Engineering Science Course               | <b>EEC</b> | Employability Enhancement Course |
| <b>PCC</b>  | Professional Core Course                 | <b>MC</b>  | Mandatory Course                 |

**TYPE OF COURSES**

|            |                              |            |                                                                  |
|------------|------------------------------|------------|------------------------------------------------------------------|
| <b>LIT</b> | Laboratory Integrated Theory | <b>PCD</b> | Personality Character Development                                |
| <b>T</b>   | Theory                       | <b>VC</b>  | Value Added Course                                               |
| <b>L</b>   | Laboratory Course            | <b>COT</b> | Community Outreach and Intervention through Technical Activities |
| <b>IP</b>  | Induction Programme          | <b>IT</b>  | Industrial Training/ Internship                                  |
| <b>MC</b>  | Mandatory Course             | <b>CC</b>  | Comprehension Course                                             |
| <b>NCC</b> | NCC Credit Course            | <b>PW</b>  | Project Work                                                     |

**CREDIT ALLOCATION**

| S.No. | Category                                                  | Suggested Breakup of Credits | Credits    |
|-------|-----------------------------------------------------------|------------------------------|------------|
| 1     | Humanities, Social Sciences and Management Courses (HSMC) | 10-13*                       | 13         |
| 2     | Basic Science Courses (BSC)                               | 23 – 27*                     | 27         |
| 3     | Engineering Science Courses (ESC)                         | 18 - 22*                     | 18         |
| 4     | Professional Core Courses (PCC)                           | 50-62*                       | 57         |
| 5     | Professional Elective Courses (PEC)                       | 15-18*                       | 15         |
| 6     | Open Elective Courses (OEC)                               | 6*                           | 6          |
| 7     | Employability Enhancement Courses (EEC)                   | 30-36*                       | 34         |
| 8     | Mandatory Courses (MC)                                    | Non Credit                   | Non Credit |
|       | <b>Total</b>                                              | <b>165 - 170*</b>            | <b>170</b> |

| SEMESTER – I  |             |                                                           |             |                |      |         |          |
|---------------|-------------|-----------------------------------------------------------|-------------|----------------|------|---------|----------|
| S. NO         | COURSE CODE | COURSE TITLE                                              | COURSE TYPE | PERIODS / WEEK |      | CREDITS | CATEGORY |
|               |             |                                                           |             | L-T-P          | TCP* |         |          |
| 1             | 24UTA161    | தமிழர் மரபு / Heritage of Tamils                          | T           | 1-0-0          | 1    | 1       | HSMC     |
| 2             | 24UEN171    | Communicative English for Engineers and Professionals - I | LIT         | 2-0-2          | 4    | 3       | HSMC     |
| 3             | 24UMA161    | Calculus and Matrix Algebra                               | T           | 3-1-0          | 4    | 4       | BSC      |
| 4             | 24UPY172    | Engineering Physics                                       | LIT         | 2-0-2          | 4    | 3       | BSC      |
| 5             | 24UCH173    | Materials Chemistry                                       | LIT         | 2-0-2          | 4    | 3       | BSC      |
| 6             | 24UCS161    | Computational Thinking                                    | T           | 2-1-0          | 3    | 3       | ESC      |
| 7             | 24UCS171    | Python Programming                                        | LIT         | 3-0-2          | 5    | 4       | ESC      |
| 8             | 24UME266    | Engineering Practices Laboratory                          | L           | 0-0-4          | 4    | 2       | ESC      |
| 9             | 24UPD191    | Personality and Character Development                     | PCD         | -              | 2    | -       | EEC      |
| 10            | 24UIP181    | Induction Programme                                       | IP          | -              | -    | -       | MC       |
| 11            | 24UMC001    | Mandatory Course I - Yoga and Meditation Fundamentals     | MC          | 1-0-0          | 1    | -       | MC       |
| Total Credits |             |                                                           |             |                |      | 23      |          |

| SEMESTER – II |             |                                                             |             |                |     |         |          |
|---------------|-------------|-------------------------------------------------------------|-------------|----------------|-----|---------|----------|
| S. NO         | COURSE CODE | COURSE TITLE                                                | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|               |             |                                                             |             | L-T-P          | TCP |         |          |
| 1             | 24UTA261    | தமிழரும் தொழில் நுட்பமும் / Tamils and Technology           | T           | 1-0-0          | 1   | 1       | HSMC     |
| 2             | 24UEN271    | Communicative English for Engineers and Professionals - II  | LIT         | 2-0-2          | 4   | 3       | HSMC     |
| 3             | 24UMA261    | Statistics and Numerical Methods                            | T           | 3-1-0          | 4   | 4       | BSC      |
| 4             | 24UPY263    | Physics for Mechanical Engineering                          | T           | 3-0-0          | 3   | 3       | BSC      |
| 5             | 24UCH261    | Environmental Sciences and Sustainability                   | T           | 2-0-0          | 2   | 2       | BSC      |
| 6             | 24UCS271    | Programming in C                                            | LIT         | 2-0-4          | 6   | 4       | ESC      |
| 7             | 24UEC271    | Electrical and Instrumentation Engineering                  | LIT         | 2-0-2          | 4   | 3       | ESC      |
| 8             | 24UME166    | Engineering Graphics                                        | L           | 0-0-4          | 4   | 2       | ESC      |
| 9             | 24USD296    | Skill Development Course                                    | LIT         | 2-0-2          | 4   | 3       | EEC      |
| 10            | 24UPD291    | Personality and Character Development                       | PCD         | -              | 2   | -       | EEC      |
| 11            | 24UMC002    | Mandatory Course II – Emotional Balance and Mental Wellness | MC          | 1-0-0          | 1   | -       | MC       |
| 12            | 24UNC201    | NCC Credit Course Level 1                                   | NCC         | -              | -   | 1       | -        |
| Total Credits |             |                                                             |             |                |     | 25      |          |

| SEMESTER – III |             |                                               |             |                |     |         |          |
|----------------|-------------|-----------------------------------------------|-------------|----------------|-----|---------|----------|
| S. NO          | COURSE CODE | COURSE TITLE                                  | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|                |             |                                               |             | L-T-P          | TCP |         |          |
| 1              | 24UMA363    | Transforms and Partial Differential Equations | T           | 3-1-0          | 4   | 4       | BSC      |
| 2              | 24UME301    | Engineering Mechanics                         | T           | 3-1-0          | 4   | 4       | PCC      |
| 3              | 24UME302    | Engineering Thermodynamics                    | T           | 3-1-0          | 4   | 4       | PCC      |
| 4              | 24UME311    | Engineering Materials and Metallurgy          | LIT         | 2-0-2          | 4   | 3       | PCC      |
| 5              | 24UME312    | Fluid Mechanics and Machinery                 | LIT         | 3-0-2          | 5   | 4       | PCC      |
| 6              | 24UME313    | Manufacturing Processes                       | LIT         | 2-0-2          | 4   | 3       | PCC      |
| 7              | 24UME321    | Computer Aided Machine Drawing                | L           | 0-0-4          | 4   | 2       | PCC      |
| 8              |             | Skill Development Elective I                  | L           | 0-0-4          | 4   | 2       | EEC      |
| 9              | 24UPD391    | Personality and Character Development         | PCD         | -              | 2   | -       | EEC      |
| 10             | 24UVC386    | Value Added Course                            | VC          | -              | -   | 2       | EEC      |
| Total Credits  |             |                                               |             |                |     | 26      |          |

| SEMESTER – IV |             |                                                                  |             |                |     |         |          |
|---------------|-------------|------------------------------------------------------------------|-------------|----------------|-----|---------|----------|
| S. NO         | COURSE CODE | COURSE TITLE                                                     | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|               |             |                                                                  |             | L-T-P          | TCP |         |          |
| 1             | 24UMA463    | Optimization Techniques                                          | T           | 3-1-0          | 4   | 4       | BSC      |
| 2             | 24UME411    | Hydraulics and Pneumatics                                        | LIT         | 2-0-2          | 4   | 3       | PCC      |
| 3             | 24UME412    | Thermal Engineering                                              | LIT         | 2-0-2          | 4   | 3       | PCC      |
| 4             | 24UME413    | Theory of Machines                                               | LIT         | 2-0-2          | 4   | 3       | PCC      |
| 5             | 24UME414    | Manufacturing Technology                                         | LIT         | 2-0-2          | 4   | 3       | PCC      |
| 6             | 24UME415    | Strength of Materials                                            | LIT         | 2-0-2          | 4   | 3       | PCC      |
| 7             |             | Career Progression Elective                                      | T           | 3-0-0          | 3   | 3       | EEC      |
| 8             |             | Skill Development Elective II                                    | L           | 0-0-4          | 4   | 2       | EEC      |
| 9             | 24UPD491    | Personality and Character Development                            | PCD         | -              | 2   | -       | EEC      |
| 10            | 24UCO492    | Community Outreach And Intervention through Technical Activities | COT         | -              | 1   | 1       | EEC      |
| 11            | 24UVC486    | Value Added Course                                               | VC          | -              | -   | 2       | EEC      |
| 12            | 24UNC401    | NCC Credit Course Level 2                                        | NCC         | -              | -   | 2       | -        |
| Total Credits |             |                                                                  |             |                |     | 25      |          |

| SEMESTER - V  |             |                                       |             |                |     |         |          |
|---------------|-------------|---------------------------------------|-------------|----------------|-----|---------|----------|
| S. NO         | COURSE CODE | COURSE TITLE                          | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|               |             |                                       |             | L-T-P          | TCP |         |          |
| 1             | 24UHV501    | Universal Human Values                | T           | 2-0-0          | 2   | 2       | HSMC     |
| 2             | 24UME501    | Design of Machine Elements            | T           | 3-0-0          | 3   | 3       | PCC      |
| 3             | 24UME511    | Heat and Mass Transfer                | LIT         | 3-0-2          | 5   | 4       | PCC      |
| 4             | 24UME512    | Metrology and Measurements            | LIT         | 2-0-2          | 4   | 3       | PCC      |
| 5             | 24UME521    | CAD / CAM Laboratory                  | L           | 0-0-4          | 4   | 2       | PCC      |
| 6             |             | Professional Elective I               | T / LIT     | -              | -   | 3       | PEC      |
| 7             |             | Professional Elective II              | T / LIT     | -              | -   | 3       | PEC      |
| 8             |             | Skill Development Elective III        | L           | 0-0-4          | 4   | 2       | EEC      |
| 9             | 24UME593    | Industrial Training/ Internship       | IT          | -              | -   | 1       | EEC      |
| 10            | 24UPD591    | Personality and Character Development | PCD         | -              | 2   | -       | EEC      |
| 11            | 24UVC586    | Value Added Course                    | VC          | -              | -   | 2       | EEC      |
| 12            |             | Mandatory Course III                  | MC          | 2-0-0          | 2   | -       | MC       |
| Total Credits |             |                                       |             |                |     | 23      |          |

| SEMESTER – VI |             |                                                                  |             |                |     |         |          |
|---------------|-------------|------------------------------------------------------------------|-------------|----------------|-----|---------|----------|
| S. NO         | COURSE CODE | COURSE TITLE                                                     | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|               |             |                                                                  |             | L-T-P          | TCP |         |          |
| 1             | 24UME601    | Design of Transmission Systems                                   | T           | 3-0-0          | 3   | 3       | PCC      |
| 2             | 24UME611    | Finite Element Analysis                                          | LIT         | 3-0-2          | 5   | 4       | PCC      |
| 3             |             | Professional Elective III                                        | T / LIT     | -              | -   | 3       | PEC      |
| 4             |             | Professional Elective IV                                         | T / LIT     | -              | -   | 3       | PEC      |
| 5             |             | Professional Elective V                                          | T / LIT     | -              | -   | 3       | PEC      |
| 6             |             | Open Elective I                                                  | T / LIT     | -              | -   | 3       | OEC      |
| 7             |             | Skill Development Elective IV                                    | L           | 0-0-4          | 4   | 2       | EEC      |
| 8             | 24UPD691    | Personality and Character Development                            | PCD         | -              | 2   | -       | EEC      |
| 9             | 24UCO692    | Community Outreach And Intervention through Technical Activities | COT         | -              | -   | 2       | EEC      |
| 10            | 24UVC686    | Value Added Course                                               | VC          | -              | -   | 2       | EEC      |
| 11            |             | Mandatory Course IV                                              | MC          | 2-0-0          | 2   | -       | MC       |
| 12            | 24UNC601    | NCC Credit Course Level 3                                        | NCC         | -              | -   | 3       | -        |
| Total Credits |             |                                                                  |             |                |     | 23      |          |

| SEMESTER – VII |             |                                  |             |                |     |         |          |
|----------------|-------------|----------------------------------|-------------|----------------|-----|---------|----------|
| S. NO          | COURSE CODE | COURSE TITLE                     | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|                |             |                                  |             | L-T-P          | TCP |         |          |
| 1              | 24UME701    | Economics and Project Management | T           | 3-0-0          | 3   | 3       | HSMC     |
| 2              | 24UME711    | Mechatronics and IoT             | LIT         | 2-0-2          | 4   | 3       | PCC      |
| 3              |             | Open Elective II                 | T / LIT     | -              | -   | 3       | OEC      |
| 4              | 24UME793    | Industrial Training / Internship | IT          | -              | -   | 2       | EEC      |
| 5              | 24UME794    | Comprehension Course             | CC          | 2-0-0          | 2   | 2       | EEC      |
| 6              | 24UME795    | Mini Project                     | PW          | 0-0-4          | 4   | 2       | EEC      |
| 7              | 24UVC786    | Value Added Course               | VC          | -              | -   | 2       | EEC      |
| Total Credits  |             |                                  |             |                |     | 15      |          |

| SEMESTER – VIII |             |              |             |                |     |         |          |
|-----------------|-------------|--------------|-------------|----------------|-----|---------|----------|
| S. NO           | COURSE CODE | COURSE TITLE | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|                 |             |              |             | L-T-P          | TCP |         |          |
| 1               | 24UME895    | Project Work | PW          | 0-0-20         | 20  | 10      | EEC      |
| Total Credits   |             |              |             |                |     | 10      |          |

**MANDATORY COURSES**

| S. NO | COURSE CODE | COURSE TITLE                                       | COURSE TYPE | PERIODS / WEEK |     | CATEGORY |
|-------|-------------|----------------------------------------------------|-------------|----------------|-----|----------|
|       |             |                                                    |             | L-T-P          | TCP |          |
| 1     | 24UMC001    | Yoga and Meditation Fundamentals                   | T           | 1-0-0          | 1   | MC       |
| 2     | 24UMC002    | Emotional Balance and Mental Wellbeing             | T           | 1-0-0          | 1   | MC       |
| 3     | 24UMC003    | Ethical behavior and code of conduct for Engineers | T           | 2-0-0          | 2   | MC       |
| 4     | 24UMC004    | Disaster Management                                | T           | 2-0-0          | 2   | MC       |
| 5     | 24UMC005    | Indian Constitution and Knowledge System           | T           | 2-0-0          | 2   | MC       |
| 6     | 24UMC006    | Ergonomics and Industrial Safety                   | T           | 2-0-0          | 2   | MC       |
| 7     | 24UMC007    | Introduction to Women and Gender Studies           | T           | 2-0-0          | 2   | MC       |

**CAREER PROGRESSION ELECTIVE**

| S. NO | COURSE CODE | COURSE TITLE                 | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|-------|-------------|------------------------------|-------------|----------------|-----|---------|----------|
|       |             |                              |             | L-T-P          | TCP |         |          |
| 1     | 24UCPE11    | Entrepreneurship Development | T           | 3-0-0          | 3   | 3       | EEC      |
| 2     | 24UCPE12    | Research Methodology         | T           | 3-0-0          | 3   | 3       | EEC      |
| 3     | 24UCPE13    | Career Development Course    | T           | 3-0-0          | 3   | 3       | EEC      |

**CATEGORY: PROFESSIONAL ELECTIVE COURSES (PEC)**

**VERTICAL 1: ENGINEERING DESIGN**

| S. NO | COURSE CODE | COURSE TITLE                                  | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|-------|-------------|-----------------------------------------------|-------------|----------------|-----|---------|----------|
|       |             |                                               |             | L-T-P          | TCP |         |          |
| 1     | 24UMEP11    | Design Concepts in Engineering                | T           | 3-0-0          | 3   | 3       | PEC      |
| 2     | 24UMEP12    | Design for Manufacture and Assembly           | T           | 3-0-0          | 3   | 3       | PEC      |
| 3     | 24UMEP13    | Ergonomics in Design                          | T           | 3-0-0          | 3   | 3       | PEC      |
| 4     | 24UMEP14    | Vibration Analysis and Control                | T           | 3-0-0          | 3   | 3       | PEC      |
| 5     | 24UMEP15    | Design of Jigs, Fixtures and Press Tools      | T           | 3-0-0          | 3   | 3       | PEC      |
| 6     | 24UMEP16    | Machine Tool Design                           | T           | 3-0-0          | 3   | 3       | PEC      |
| 7     | 24UMEP17    | CAD / CAM                                     | T           | 3-0-0          | 3   | 3       | PEC      |
| 8     | 24UMEP18    | Tribology and Industrial Applications         | T           | 3-0-0          | 3   | 3       | PEC      |
| 9     | 24UMEP19    | Product Development and Life Cycle Management | T           | 3-0-0          | 3   | 3       | PEC      |

**VERTICAL 2: MATERIALS AND MANUFACTURING**

| S. NO | COURSE CODE | COURSE TITLE                                 | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|-------|-------------|----------------------------------------------|-------------|----------------|-----|---------|----------|
|       |             |                                              |             | L-T-P          | TCP |         |          |
| 1     | 24UMEP21    | Physical Metallurgy                          | T           | 3-0-0          | 3   | 3       | PEC      |
| 2     | 24UMEP22    | Composite Materials                          | T           | 3-0-0          | 3   | 3       | PEC      |
| 3     | 24UMEP23    | Smart Materials and Structures               | T           | 3-0-0          | 3   | 3       | PEC      |
| 4     | 24UMEP24    | Biomaterials and Ceramics                    | T           | 3-0-0          | 3   | 3       | PEC      |
| 5     | 24UMEP25    | Welding Technology                           | LIT         | 2-0-2          | 4   | 3       | PEC      |
| 6     | 24UMEP26    | Additive Manufacturing                       | LIT         | 2-0-2          | 4   | 3       | PEC      |
| 7     | 24UMEP27    | Lean Manufacturing                           | T           | 3-0-0          | 3   | 3       | PEC      |
| 8     | 24UMEP28    | Digital Manufacturing and IoT                | T           | 3-0-0          | 3   | 3       | PEC      |
| 9     | 24UMEP29    | Non-Traditional Machining Processes          | T           | 3-0-0          | 3   | 3       | PEC      |
| 10    | 24UMEP30    | Failure Analysis and Non-Destructive Testing | T           | 3-0-0          | 3   | 3       | PEC      |

**VERTICAL 3: INDUSTRIAL ENGINEERING**

| S. NO | COURSE CODE | COURSE TITLE                         | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|-------|-------------|--------------------------------------|-------------|----------------|-----|---------|----------|
|       |             |                                      |             | L-T-P          | TCP |         |          |
| 1     | 24UMEP31    | Principles of Management             | T           | 3-0-0          | 3   | 3       | PEC      |
| 2     | 24UMEP32    | Total Quality Management             | T           | 3-0-0          | 3   | 3       | PEC      |
| 3     | 24UMEP33    | Industrial Safety                    | T           | 3-0-0          | 3   | 3       | PEC      |
| 4     | 24UMEP34    | Computer Integrated Manufacturing    | T           | 3-0-0          | 3   | 3       | PEC      |
| 5     | 24UMEP35    | Plant Layout and Material Handling   | T           | 3-0-0          | 3   | 3       | PEC      |
| 6     | 24UMEP36    | Lean Supply Chain Management         | T           | 3-0-0          | 3   | 3       | PEC      |
| 7     | 24UMEP37    | Process Planning and Cost Estimation | T           | 3-0-0          | 3   | 3       | PEC      |
| 8     | 24UMEP38    | Industrial Management                | T           | 3-0-0          | 3   | 3       | PEC      |
| 9     | 24UMEP39    | Operations Research                  | T           | 3-0-0          | 3   | 3       | PEC      |

**VERTICAL 4: THERMAL ENGINEERING**

| S. NO | COURSE CODE | COURSE TITLE                                   | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|-------|-------------|------------------------------------------------|-------------|----------------|-----|---------|----------|
|       |             |                                                |             | L-T-P          | TCP |         |          |
| 1     | 24UMEP41    | Turbo machines                                 | T           | 3-0-0          | 3   | 3       | PEC      |
| 2     | 24UMEP42    | Renewable Energy Resources and Systems         | T           | 3-0-0          | 3   | 3       | PEC      |
| 3     | 24UMEP43    | Power Plant Engineering                        | T           | 3-0-0          | 3   | 3       | PEC      |
| 4     | 24UMEP44    | Advanced Internal Combustion Engines           | LIT         | 2-0-2          | 4   | 3       | PEC      |
| 5     | 24UMEP45    | Heating, Ventilation and Air-Conditioning      | LIT         | 2-0-2          | 4   | 3       | PEC      |
| 6     | 24UMEP46    | Thermal Power Engineering                      | T           | 3-0-0          | 3   | 3       | PEC      |
| 7     | 24UMEP47    | Computational Solid Mechanics                  | T           | 3-0-0          | 3   | 3       | PEC      |
| 8     | 24UMEP48    | Gas Dynamics and Jet Propulsion                | T           | 3-0-0          | 3   | 3       | PEC      |
| 9     | 24UMEP49    | Computational Fluid Dynamics and Heat Transfer | LIT         | 2-0-2          | 4   | 3       | PEC      |

**VERTICAL 5: ROBOTICS AND AUTOMATION**

| S. NO | COURSE CODE | COURSE TITLE                                            | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|-------|-------------|---------------------------------------------------------|-------------|----------------|-----|---------|----------|
|       |             |                                                         |             | L-T-P          | TCP |         |          |
| 1     | 24UMEP51    | Sensors and Instrumentation                             | T           | 3-0-0          | 3   | 3       | PEC      |
| 2     | 24UMEP52    | Measurements and Controls                               | LIT         | 2-0-2          | 4   | 3       | PEC      |
| 3     | 24UMEP53    | Automation in Manufacturing                             | T           | 3-0-0          | 3   | 3       | PEC      |
| 4     | 24UMEP54    | Smart Manufacturing                                     | T           | 3-0-0          | 3   | 3       | PEC      |
| 5     | 24UMEP55    | Robotics                                                | LIT         | 2-0-2          | 4   | 3       | PEC      |
| 6     | 24UMEP56    | Embedded Systems and Programming                        | T           | 3-0-0          | 3   | 3       | PEC      |
| 7     | 24UMEP57    | Industry 4.0                                            | T           | 3-0-0          | 3   | 3       | PEC      |
| 8     | 24UMEP58    | Microprocessor and Artificial Intelligence for Industry | T           | 3-0-0          | 3   | 3       | PEC      |

**VERTICAL 6: AUTOMOTIVE AND ENERGY ENGINEERING**

| S. NO | COURSE CODE | COURSE TITLE                                         | COURSE TYPE | PERIODS / WEEK |     | CREDITS | CATEGORY |
|-------|-------------|------------------------------------------------------|-------------|----------------|-----|---------|----------|
|       |             |                                                      |             | L-T-P          | TCP |         |          |
| 1     | 24UMEP61    | Automotive Engines and Subsystems                    | LIT         | 2-0-2          | 4   | 3       | PEC      |
| 2     | 24UMEP62    | Hybrid and Electric Vehicle Technology               | T           | 3-0-0          | 3   | 3       | PEC      |
| 3     | 24UMEP63    | Smart Mobility and Vehicle Systems                   | T           | 3-0-0          | 3   | 3       | PEC      |
| 4     | 24UMEP64    | Bioenergy Conversion Technologies                    | T           | 3-0-0          | 3   | 3       | PEC      |
| 5     | 24UMEP65    | Energy Storage Devices                               | T           | 3-0-0          | 3   | 3       | PEC      |
| 6     | 24UMEP66    | Energy Conservation in Industries                    | T           | 3-0-0          | 3   | 3       | PEC      |
| 7     | 24UMEP67    | Energy Management and Equipment Design               | T           | 3-0-0          | 3   | 3       | PEC      |
| 8     | 24UMEP68    | Carbon Footprint Estimation and Reduction Techniques | T           | 3-0-0          | 3   | 3       | PEC      |
| 9     | 24UMEP69    | Equipment for Pollution Control                      | T           | 3-0-0          | 3   | 3       | PEC      |

## OPEN ELECTIVES

### B. TECH. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

| S. NO | COURSE CODE | COURSE TITLE                                                 | COURSE TYPE | PERIODS / WEEK |     | CREDITS |
|-------|-------------|--------------------------------------------------------------|-------------|----------------|-----|---------|
|       |             |                                                              |             | L-T-P          | TCP |         |
| 1     | 24UADO01    | Introduction to Artificial Intelligence and Machine Learning | T           | 3-0-0          | 3   | 3       |
| 2     | 24UADO02    | Introduction to Data Science                                 | T           | 3-0-0          | 3   | 3       |
| 3     | 24UADO03    | Introduction to Big Data Analytics                           | T           | 3-0-0          | 3   | 3       |
| 4     | 24UADO04    | Data Visualization Techniques                                | T           | 3-0-0          | 3   | 3       |
| 5     | 24UADO05    | Introduction to Devops Tools                                 | T           | 3-0-0          | 3   | 3       |
| 6     | 24UADO06    | Fundamentals of Storage Technologies                         | T           | 3-0-0          | 3   | 3       |
| 7     | 24UADO07    | Basics of Cloud Services                                     | T           | 3-0-0          | 3   | 3       |

### B.E. CSE (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

| S. NO | COURSE CODE | COURSE TITLE                                | COURSE TYPE | PERIODS / WEEK |     | CREDITS |
|-------|-------------|---------------------------------------------|-------------|----------------|-----|---------|
|       |             |                                             |             | L-T-P          | TCP |         |
| 1     | 24UAMO01    | Fundamentals of Artificial Intelligence     | T           | 3-0-0          | 3   | 3       |
| 2     | 24UAMO02    | Principles of Machine Learning              | T           | 3-0-0          | 3   | 3       |
| 3     | 24UAMO03    | Fundamentals of Deep Learning               | LIT         | 2-0-2          | 4   | 3       |
| 4     | 24UAMO04    | Virtualization and Container Technologies   | LIT         | 2-0-2          | 4   | 3       |
| 5     | 24UAMO05    | Python Frameworks for Web Applications      | LIT         | 2-0-2          | 4   | 3       |
| 6     | 24UAMO06    | Fundamentals of Natural Language Processing | T           | 3-0-0          | 3   | 3       |
| 7     | 24UAMO07    | AI for Mechanical Engineering               | T           | 3-0-0          | 3   | 3       |
| 8     | 24UAMO08    | AI for food processing                      | T           | 3-0-0          | 3   | 3       |
| 9     | 24UAMO09    | AI for Game Development                     | T           | 3-0-0          | 3   | 3       |

### B. TECH. COMPUTER SCIENCE AND BUSINESS SYSTEMS

| S. NO | COURSE CODE | COURSE TITLE                               | COURSE TYPE | PERIODS / WEEK |     | CREDITS |
|-------|-------------|--------------------------------------------|-------------|----------------|-----|---------|
|       |             |                                            |             | L-T-P          | TCP |         |
| 1     | 24UCBO01    | Modern Web Applications                    | T           | 3-0-0          | 3   | 3       |
| 2     | 24UCBO02    | Applied Design Thinking                    | T           | 3-0-0          | 3   | 3       |
| 3     | 24UCBO03    | Human Computer Interaction                 | T           | 3-0-0          | 3   | 3       |
| 4     | 24UCBO04    | Social Information Network                 | T           | 3-0-0          | 3   | 3       |
| 5     | 24UCBO05    | Artificial Intelligence and Expert Systems | T           | 3-0-0          | 3   | 3       |
| 6     | 24UCBO06    | Usability Design of Software Applications  | T           | 3-0-0          | 3   | 3       |
| 7     | 24UCBO07    | Data Mining and Analytics                  | T           | 3-0-0          | 3   | 3       |

**B.E. COMPUTER SCIENCE AND ENGINEERING**

| S. NO | COURSE CODE | COURSE TITLE                     | COURSE TYPE | PERIODS / WEEK |     | CREDITS |
|-------|-------------|----------------------------------|-------------|----------------|-----|---------|
|       |             |                                  |             | L-T-P          | TCP |         |
| 1     | 24UCSO01    | Fundamentals of Data Structures  | LIT         | 2-0-2          | 4   | 3       |
| 2     | 24UCSO02    | Principles of Computer Networks  | LIT         | 2-0-2          | 4   | 3       |
| 3     | 24UCSO03    | Video Creation and Editing       | LIT         | 2-0-2          | 4   | 3       |
| 4     | 24UCSO04    | Fundamentals of Database Systems | LIT         | 2-0-2          | 4   | 3       |
| 5     | 24UCSO05    | Basics of Web Development        | LIT         | 2-0-2          | 4   | 3       |
| 6     | 24UCSO06    | Introduction to Digital Currency | T           | 3-0-0          | 3   | 3       |

**B.E. COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)**

| S. NO | COURSE CODE | COURSE TITLE                             | COURSE TYPE | PERIODS / WEEK |     | CREDITS |
|-------|-------------|------------------------------------------|-------------|----------------|-----|---------|
|       |             |                                          |             | L-T-P          | TCP |         |
| 1     | 24UCYO01    | Cybersecurity Fundamentals               | T           | 3-0-0          | 3   | 3       |
| 2     | 24UCYO02    | Information Security Management          | T           | 3-0-0          | 3   | 3       |
| 3     | 24UCYO03    | Incident Response and Forensics          | T           | 3-0-0          | 3   | 3       |
| 4     | 24UCYO04    | Cyber Law and Ethics                     | T           | 3-0-0          | 3   | 3       |
| 5     | 24UCYO05    | Security Operations                      | T           | 3-0-0          | 3   | 3       |
| 6     | 24UCYO06    | Introduction to Open Source Intelligence | T           | 3-0-0          | 3   | 3       |

**B.E. ELECTRONICS AND COMMUNICATION ENGINEERING**

| S. NO | COURSE CODE | COURSE TITLE                                         | COURSE TYPE | PERIODS / WEEK |     | CREDITS |
|-------|-------------|------------------------------------------------------|-------------|----------------|-----|---------|
|       |             |                                                      |             | L-T-P          | TCP |         |
| 1     | 24UECO01    | Remote Sensing Concepts                              | T           | 3-0-0          | 3   | 3       |
| 2     | 24UECO02    | Sensors and Actuators                                | T           | 3-0-0          | 3   | 3       |
| 3     | 24UECO03    | Concepts in Mobile Robots                            | T           | 3-0-0          | 3   | 3       |
| 4     | 24UECO04    | Drone Technologies                                   | T           | 3-0-0          | 3   | 3       |
| 5     | 24UECO05    | Geographical Information System                      | T           | 3-0-0          | 3   | 3       |
| 6     | 24UECO06    | Introduction to Embedded C                           | LIT         | 2-0-2          | 4   | 3       |
| 7     | 24UECO07    | Fundamentals of Microprocessors and Microcontrollers | LIT         | 2-0-2          | 4   | 3       |
| 8     | 24UECO08    | Energy Storing Devices                               | T           | 3-0-0          | 3   | 3       |
| 9     | 24UECO09    | Semiconductor and Devices                            | T           | 3-0-0          | 3   | 3       |

**B.Tech. INFORMATION TECHNOLOGY**

| <b>S.<br/>NO</b> | <b>COURSE CODE</b> | <b>COURSE TITLE</b>                     | <b>COURSE<br/>TYPE</b> | <b>PERIODS / WEEK</b> |            | <b>CREDITS</b> |
|------------------|--------------------|-----------------------------------------|------------------------|-----------------------|------------|----------------|
|                  |                    |                                         |                        | <b>L-T-P</b>          | <b>TCP</b> |                |
| 1                | 24UITO01           | Functional Programming                  | T                      | 3-0-0                 | 3          | 3              |
| 2                | 24UITO02           | Fundamentals of Cryptography            | T                      | 3-0-0                 | 3          | 3              |
| 3                | 24UITO03           | Software Engineering                    | T                      | 3-0-0                 | 3          | 3              |
| 4                | 24UITO04           | Concepts of Object Oriented Programming | LIT                    | 2-0-2                 | 4          | 3              |
| 5                | 24UITO05           | Fundamentals of Computer Vision         | T                      | 3-0-0                 | 3          | 3              |
| 6                | 24UITO06           | Foundations of Block chain              | T                      | 3-0-0                 | 3          | 3              |
| 7                | 24UITO07           | Game Theory and Mechanism Design        | T                      | 3-0-0                 | 3          | 3              |

## **GUIDELINES FOR CHOOSING COURSES UNDER PEC**

|           | PEC- I                                                    | PEC- II                                                  |                                                  | PEC- III                                                   | PEC- IV                                                             | PEC- V                                                           |
|-----------|-----------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------|
|           | ENGINEERING DESIGN                                        | MATERIALS AND MANUFACTURING                              | INDUSTRIAL ENGINEERING                           | THERMAL ENGINEERING                                        | ROBOTICS AND AUTOMATION                                             | AUTOMOTIVE AND ENERGY ENGINEERING                                |
| Cluster A | 24UMEP11<br>Design Concepts in Engineering                | 24UMEP21<br>Physical Metallurgy                          | 24UMEP33<br>Industrial Safety                    | 24UMEP44<br>Advanced Internal Combustion Engines           | 24UMEP51<br>Sensors and Instrumentation                             | 24UMEP61<br>Automotive Engines and Subsystems                    |
|           | 24UMEP13<br>Ergonomics in Design                          | 24UMEP22<br>Composite Materials                          |                                                  | 24UMEP41<br>Turbo machines                                 | 24UMEP52<br>Measurements and Controls                               | 24UMEP62<br>Hybrid and Electric Vehicle Technology               |
|           | 24UMEP12<br>Design for Manufacture and Assembly           | 24UMEP23<br>Smart Materials and Structures               |                                                  |                                                            | 24UMEP56<br>Embedded Systems and Programming                        | 24UMEP63<br>Smart Mobility and Vehicle Systems                   |
|           |                                                           | 24UMEP24<br>Biomaterials and Ceramics                    |                                                  |                                                            |                                                                     |                                                                  |
| Cluster B | 24UMEP15<br>Design of Jigs, Fixtures and Press Tools      | 24UMEP26<br>Additive Manufacturing                       | 24UMEP31<br>Principles of Management             | 24UMEP43<br>Power Plant Engineering                        | 24UMEP54<br>Smart Manufacturing                                     | 24UMEP64<br>Bioenergy Conversion Technologies                    |
|           | 24UMEP16<br>Machine Tool Design                           | 24UMEP27<br>Lean Manufacturing                           | 24UMEP32<br>Total Quality Management             | 24UMEP42<br>Renewable Energy Resources and Systems         | 24UMEP57<br>Industry 4.0                                            | 24UMEP65<br>Energy Storage Devices                               |
|           | 24UMEP18<br>Tribology and Industrial Applications         | 24UMEP28<br>Digital Manufacturing and IoT                | 24UMEP38<br>Industrial Management                | 24UMEP46<br>Thermal Power Engineering                      |                                                                     |                                                                  |
| Cluster C | 24UMEP17<br>CAD / CAM                                     | 24UMEP25<br>Welding Technology                           | 24UMEP36<br>Lean Supply Chain Management         | 24UMEP47<br>Computational Solid Mechanics                  | 24UMEP55<br>Robotics                                                | 24UMEP66<br>Energy Conservation in Industries                    |
|           |                                                           | 24UMEP29<br>Non-Traditional Machining Processes          | 24UMEP35<br>Plant Layout and Material Handling   | 24UMEP49<br>Computational Fluid Dynamics and Heat Transfer | 24UMEP53<br>Automation in Manufacturing                             | 24UMEP67<br>Energy Management and Equipment Design               |
|           |                                                           |                                                          | 24UMEP37<br>Process Planning and Cost Estimation |                                                            |                                                                     |                                                                  |
|           |                                                           |                                                          | 24UMEP39<br>Operations Research                  |                                                            |                                                                     |                                                                  |
| Cluster D | 24UMEP14<br>Vibration Analysis and Control                | 24UMEP30<br>Failure Analysis and Non-Destructive Testing | 24UMEP34<br>Computer Integrated Manufacturing    | 24UMEP48<br>Gas Dynamics and Jet Propulsion                | 24UMEP58<br>Microprocessor and Artificial Intelligence for Industry | 24UMEP68<br>Carbon Footprint Estimation and Reduction Techniques |
| Cluster E | 24UMEP19<br>Product Development and Life Cycle Management |                                                          |                                                  | 24UMEP45<br>Heating, Ventilation and Air-Conditioning      |                                                                     | 24UMEP69<br>Equipment for Pollution Control                      |
|           |                                                           |                                                          |                                                  |                                                            |                                                                     |                                                                  |

|                       |                                   |                                                  |                                      |                                           |                                                        |                                                        |
|-----------------------|-----------------------------------|--------------------------------------------------|--------------------------------------|-------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| Pre-requisite Courses | 24UME301<br>Engineering Mechanics | 24UPY172<br>Engineering Physics                  | 24UME313<br>Manufacturing Processes  | 24UME302<br>Engineering Thermodynamics    | 24UEC271<br>Electrical and Instrumentation Engineering | 24UEC271<br>Electrical and Instrumentation Engineering |
|                       | 24UME413<br>Theory of Machines    | 24UCH173<br>Materials Chemistry                  | 24UME414<br>Manufacturing Technology | 24UME312<br>Fluid Mechanics and Machinery | 24UME312<br>Fluid Mechanics and Machinery              | 24UCH261<br>Environmental Sciences and Sustainability  |
|                       | 24UME415<br>Strength of Materials | 24UPY263<br>Physics for Mechanical Engineering   | 24UMA463<br>Optimization Techniques  | 24UME412<br>Thermal Engineering           | 24UME413<br>Theory of Machines                         | 24UME412<br>Thermal Engineering                        |
|                       |                                   | 24UME313<br>Manufacturing Processes              |                                      | 24UME511<br>Heat and Mass Transfer        | 24UME411<br>Hydraulics and Pneumatics                  | 24UME501<br>Design of Machine Elements                 |
|                       |                                   | 24UME311<br>Engineering Materials and Metallurgy |                                      |                                           |                                                        |                                                        |

### **Criteria for Choosing Courses for Professional Electives**

PEC - I: Any course from any cluster is fine.

PEC - II: Can be from “Materials and Manufacturing” and “Industrial Engineering”. Any course from any cluster is fine.

PEC - III: Any course from any cluster is fine.

PEC - IV: Any course from any cluster is fine.

PEC - V: Better to choose a course from cluster A, C or D. Any other course is also fine.

**It is better to choose Courses from a Cluster in the prescribed order**

### **Open elective - Course Preferences for students belonging to MECH Department**

| S.No | Departments | Course Preference  |
|------|-------------|--------------------|
| 1    | AI & DS     | 24UADO02, 24UADO06 |
| 2    | AI & ML     | 24UAMO01, 24UAMO07 |
| 3    | CSBS        | 24UCBO03, 24UCBO07 |
| 4    | CSE         | 24UCSO03, 24UCSO06 |
| 5    | CYS         | 24UCYO01, 24UCYO04 |
| 6    | ECE         | 24UECO02, 24UECO07 |
| 7    | IT          | 24UITO01, 24UITO03 |