

Program Schemes for [B.E. in Mechanical Engineering (ME201)]

Cluster: Engineering & Technology

Institute: UIE

Department: **Mechanical Engineering**

Type of Program: UG

| First Year | | | | Second Year | | | |
|--------------------|--------------------------------------|---------------------|---------|-------------------|--|------------------------|---------|
| | Course Name | Course Category | Credits | | Course Name | Course Category | Credits |
| Semester-1 | Logical Thinking and Problem Solving | Major Core | 4 | Semester-3 | Mechanical Measurement and Metrology | Minor core | 4 |
| | Mathematics-I | Major Core (BS) | 5 | | Strength of Materials | Major core | 5 |
| | Communication Skills-I | Skill Enhancement | 2 | | Engineering Thermodynamics | Major core | 4 |
| | Semiconductor Physics & Applications | Major Core (BS) | 3 | | Theory of Machines | Major core | 5 |
| | Engineering Physics | Major Core (BS) | 4 | | Social Internship (Community Engagement and Social Responsibility) | Internship or Training | 2 |
| | Engineering Graphics using CAD Lab | Major Core | 2 | | Aptitude-1 | Ability Enhancement | 1 |
| | AI Applications Lab | Ability Enhancement | 1 | | Entrepreneurship Mindset | Ability Enhancement | 1 |
| | Design Thinking & Innovation | Skill Enhancement | 1 | | Critical Enquiry and Research Methodology | Ability Enhancement | 1 |
| | | | | | General Proficiency-2 | Ability Enhancement | 1 |
| Semester -2 | Data Structures and Algorithms | Major Core | 4 | Semester-4 | Program Elective-1 | Minor Elective | 3 |
| | Mathematics- II | Major Core (BS) | 5 | | Applied Mathematics-III | Minor Core (BS) | 4 |
| | Soft Skills- I | Skill Enhancement | 1 | | Applied Thermodynamics | Major Core | 4 |

| | | | | | | | |
|--|--|---------------------|---|--|--|---------------------|---|
| | General Proficiency-1 | Ability Enhancement | 1 | | Manufacturing Processes and Techniques | Major core | 5 |
| | Emerging & Disruptive Technologies Workshop | Major Core | 2 | | General Proficiency - 3 | Skill Enhancement | 1 |
| | Engineering Chemistry | Major Core (BS) | 3 | | Universal Human Values, Ethics and Life Skills-2 | Value Education | 2 |
| | Engineering Mechanics | Major Core | 3 | | Mid-Grade Project-I [MGP-1] | Project | 1 |
| | Workshop | Major Core | 1 | | Aptitude-2 | Ability Enhancement | 1 |
| | Universal Human values, Ethics and Life Skills-I | Value Education | 1 | | Soft Skills-2 | Skill Enhancement | 1 |
| | Communications Skills – II | Skill Enhancement | 1 | | Marketing & Management Essentials | Ability Enhancement | 1 |
| | | | | | AI Automation & Sustainability | Skill Enhancement | 1 |
| | | | | | Academic Writing | Ability Enhancement | 1 |
| | | | | | Research Ethics & Intellectual Property Rights | Skill Enhancement | 1 |

| Third Year | | | | Fourth Year | | | |
|--------------------|---|-----------------|---------|-------------------|-----------------------------------|-----------------|---------|
| | Course Name | Course Category | Credits | | Course Name | Course Category | Credits |
| Semester -5 | Program Elective - II | Minor Elective | 3 | Semester-7 | Program Elective – V | Minor Elective | 3 |
| | Numerical Analysis | Minor Core (BS) | 4 | | Open Elective-II | Open Electives | 3 |
| | Refrigeration and Air Conditioning | Major Core | 4 | | Automotive Technology | Major Core | 3 |
| | Fluid Mechanics and Hydraulics Machines | Major Core | 5 | | Capstone Project-1 / Dissertation | PROJECT | 4 |

| | | | Internship | / Training | |
|--------------------------------------|---------------------|---|------------|------------|--|
| Design of Machine Elements | Major Core | 4 | | | |
| Mid-Grade Project-II [MGP-2] | Project | 1 | | | |
| Introduction to SDGs | Value Education | 1 | | | |
| Aptitude-4 | Ability Enhancement | 1 | | | |
| Soft Skills-4 | Skill Enhancement | 1 | | | |
| Customer Engagement & Organic Growth | Ability Enhancement | 1 | | | |
| Business Planning & Legal Basics | Skill Enhancement | 1 | | | |
| AI & Data-Driven Research | Ability Enhancement | 1 | | | |
| Domain Specific Term Paper | Skill Enhancement | 1 | | | |

I. Elective Basket (Thermal)

| Semester | Course Name | Course Category | Credits |
|----------|---|-----------------|---------|
| 4 | Power Plant Engineering | Minor Elective | 3 |
| 5 | Internal Combustion (I.C.) Engines and Alternative Fuels | Minor Elective | 3 |
| 6 | Applied Computational Fluid Dynamics (CFD) and Simulation | Minor Elective | 3 |
| 6 | Gas Turbine and Jet Propulsion Systems | Minor Elective | 3 |
| 7 | Renewable and Hybrid Energy Systems | Minor Elective | 3 |
| 8 | Energy Management | Minor Elective | 3 |

II. Elective Basket (Design)

| Semester | Course Name | Course Category | Credits |
|----------|----------------------------------|-----------------|---------|
| 4 | Advanced Mechanics of Solids | Minor Elective | 3 |
| 5 | Industrial Automation & Robotics | Minor Elective | 3 |



| | | | |
|---|-------------------------------|----------------|---|
| 6 | Computer Aided Engineering | Minor Elective | 3 |
| 6 | Industry 4.0 and Digital Twin | Minor Elective | 3 |
| 7 | Mechanical Vibrations | Minor Elective | 3 |
| 8 | Tribology | Minor Elective | 3 |

| III. Elective Basket (Production) | | | |
|--|--|------------------------|----------------|
| Semester | Course Name | Course Category | Credits |
| 4 | Material Science | Minor Elective | 3 |
| 5 | Operations Research for Industrial Decision-Making | Minor Elective | 3 |
| 6 | Computer Integrated and Manufacturing systems | Minor Elective | 3 |
| 6 | Non Traditional Machining | Minor Elective | 3 |
| 7 | Industrial Engineering | Minor Elective | 3 |
| 8 | Total Quality Management | Minor Elective | 3 |