**School of Engineering**

**Department of Mechanical Engineering**

**B.Tech Mechanical Engineering with specialization in E-Vehicles & Autonomous Vehicles**

**GALGOTIAS UNIVERSITY**

**Program Structure: B.Tech Mechanical Engineering with specialization in E-Vehicles & Autonomous Vehicles**

| Semester-1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sl. No.** | **Course Code** | **Subject Name** | **Course Type** | **L** | **T** | **P** | | **C** |
| 1 | G2UA120B | Basic Electrical and Electronics Engineering | B | 3 | 0 | 1 | | 4 |
| 2 | L1UB120T | YOGA | T | 2 | 0 | 0 | | 0 |
| 3 | G3UB101B | Engineering design and prototyping | B | 3 | 0 | 1 | | 4 |
| 4 | C1UC122B | Engineering Mathematics-I | B | 3 | 0 | 1 | | 4 |
| 5 | E2UC102C | Programming for problem solving | C | 2 | 0 | 2 | | 4 |
| 6 | C1UB129T | Chemical and biological materials | T | 3 | 0 | 0 | | 3 |
| **Total** | | | | **16** | **0** | **5** | | **19** |

| Semester-2 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sl. No.** | **Course Code** | **Subject Name** | **Course Type** | **L** | **T** | **P** | **S** | **C** |
| 1 | C1UD124B | Semiconductor and Optoelectronics devices | B | 3 | 0 | 1 | | 4 |
| 2 | G3UB201T | Engineering Mechanics | T | 3 | 1 | 0 | | 4 |
| 3 | O1UA104B | Communication skill for engineers | B | 2 | 0 | 1 | | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | C1UB120T | Environment Impact analysis | T | 0 | 0 | 0 | | 0 |
| 5 | C1UC222B | Engineering Mathematics II | B | 3 | 0 | 1 | | 4 |
| 6 | E2UC201C | OOPS using java | C | 3 | 0 | 2 | | 5 |
| 7 | G3UB201B | Engineering workshop | C | 1 | 0 | 2 | 1 | 3 |
| **Total** | | | | **15** | **1** | **7** | **1** | **23** |

**Semester 3**

| **Sl. No.** | **Course Code** | **Course Title** | **Course Type** | **L** | **T** | **P** | | **C** |
|---|---|---|---|---|---|---|---|---|
| 1 | G3UB301T | Applied Engineering Mechanics | T | 2 | 1 | 0 | | 3 |
| 2 | G3UB302T | Engineering Thermodynamics | T | 2 | 1 | 0 | | 3 |
| 3 | G3UB303B | Manufacturing Processes I | B | 3 | 0 | 2 | | 4 |
| 4 | G3UB304B | Material Science | B | 2 | 0 | 2 | | 3 |
| 5 | C1UC321T | Functions of complex variables and Transforms | T | 3 | 0 | 0 | | 3 |
| 6 | GIUA306B | Design thinking-I | T | 1 | 0 | 1 | | 0 |
| 7 | K1UC320B | Communication competency and aptitude building-1 | B | 1 | 0 | 1 | | 2 |
| 8 | G3UB305B | Machine Drawing with Solid Works | C | 2 | 0 | 2 | 1 | 4 |
| **Total** | | | | **16** | **2** | **8** | **1** | **22** |

**Semester 4**

| **Sl. No.** | **Course Code** | **Course Title** | **Course Type** | **L** | **T** | **P** | | **C** |
|---|---|---|---|---|---|---|---|---|
| 1 | G3UB401B | Mechanics of Material | B | 2 | 1 | 2 | | 4 |
| 2 | G3UB402C | Fluid Mechanics | B | 2 | 1 | 2 | | 5 |
| 3 | G3UB403B | Manufacturing Processes II and Metrology | B | 3 | 0 | 2 | | 4 |
| 4 | G2UA403T | Sensors and transducers (Minor-1) | T | 3 | 0 | 0 | | 3 |

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|---|---|---|---|---|---|---|---|---|
| 5 | O1UA421B | Communication competency and Aptitude Building 2 | T | 1 | 0 | 1 | | 2 |
| 6 | G3UB404B | Applied Thermodynamics | T | 3 | 0 | 1 | | 4 |
| 7 | C1UC424B | Numerical methods | T | 2 | 0 | 1 | | 3 |
| 8 | G3UA601B | Design Thinking-II | B | 1 | 0 | 1 | | 0 |
| **Total** | | | | **16** | **2** | **7** | | **25** |

**Semester 5**

| Sl. No. | Course Code | Course Title | Course Type | L | T | P | | C |
|---|---|---|---|---|---|---|---|---|
| 1 | G3UB501T | Kinematics of Machines | T | 2 | 1 | 0 | | 3 |
| 2 | G3UB502C | Machine Design | C | 3 | 0 | 2 | 1 | 5 |
| 3 | G3UC501B | Fundamental of EV and HEV | B | 2 | 0 | 1 | | 3 |
| 4 | G3UB503T | Automobile Engineering (minor-2) | T | 2 | 0 | 0 | | 2 |
| 5 | G3UB504B | Heat and Mass Transfer | I | 2 | 1 | 2 | | 4 |
| 6 | GIUA306B | Design thinking-I | T | 1 | 0 | 1 | | 0 |
| 7 | G3UB506T | CAM, and Automation | T | 2 | 0 | 0 | | 2 |
| 8 | G3UB507T | Augumented Reality /Virtual Reality (minor-3) | T | 3 | 0 | 0 | | 3 |
| 9 | K1UC523B | Communication Competency and Aptitude Building -III | I | 1 | 0 | 2 | | 2 |
| **Total** | | | | **18** | **2** | **8** | | **24** |

**Semester 6**

| Sl. No. | Course Code | Course Title | Course Type | L | T | P | | C |
|---|---|---|---|---|---|---|---|---|
| 1 | G3UB601B | Refrigeration and Air Conditioning | T | 2 | 1 | 2 | | 4 |
| 2 | G3UB602B | Dynamics of Machines | B | 2 | 1 | 2 | | 4 |
| 3 | G3UB601B | FEM (minor-4) | C | 2 | 1 | 2 | 1 | 5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | G3UB603B | Robotics (minor-5) | B | 3 | 0 | 1 | | 4 |
| 5 | G3UC603B | EV drive and Control | T | 2 | 0 | 1 | | 3 |
| 6 | G3UC604C | EV/HEV Power Train | T | 3 | 0 | 2 | | 5 |
| | G3UA601B | Design Thinking-II | B | 1 | 0 | 1 | | 0 |
| 8 | O1UA602B | Soft Skill - 6 (Campus to Corporate) | B | 1 | 0 | 2 | | 2 |
| **Total** | | | | **16** | **3** | **13** | | **27** |
| **Semester 7** | | | | | | | | |
| **Sl. No.** | **Course Code** | **Course Title** | **Course Type** | **L** | **T** | **P** | | **C** |
| 1 | G3UC702B | Energy storage Battery BMS and BTMS | B | 3 | 0 | 1 | | 4 |
| 2 | G3UC705T | Fundamentals of autonomous vehicle | T | 3 | 0 | 0 | | 3 |
| 3 | G3UC706T | Fundamental of hydrogen and fuel cell | T | 3 | 0 | 0 | | 3 |
| 4 | G1UA705R | Summer Internship | | 0 | 0 | 0 | | 2 |
| 5 | G3UC704R | Capstone Project- Phase I/Industrial Internship Domain 5 | | - | - | - | | 3 |
| **Total** | | | | **9** | **4** | **23** | | **15** |
| **Semester 8** | | | | | | | | |
| **Sl. No.** | **Course Code** | **Course Title** | **Course Type** | **L** | **T** | **P** | | **C** |
| 1 | | Capstone Project- Phase II | | - | - | - | | 9 |
| | | **Total** | | | | | | **9** |
| **Total Program Credit** | | | | **164** | | | | |
| | | | | | | | | |
| **Minor Elective Courses - Streamwise** | | | | | | | | |
| **Sl No** | | **Mechatronics** | | **L** | **T** | **P** | | **C** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | | Sensors and Actuators | | 3 | 0 | 0 | | 3 |
| 2 | | Automatic Control Systems | | 3 | 0 | 0 | | 3 |
| 3 | | Design of Mechatronics System | | 3 | 0 | 0 | | 3 |
| 4 | | Modelling and Simulation of Mechatronics System | | 3 | 0 | 0 | | 3 |
| 5 | | Computer Integrated Manufacturing | | 3 | 0 | 0 | | 3 |
| 6 | | Robotics: Analysis and Systems | | 3 | 0 | 0 | | 3 |
| 7 | | Drives and Control system for Automation | | 3 | 0 | 0 | | 3 |
| 8 | | Process Control & Automation | | 3 | 0 | 0 | | 3 |
| 9 | | Flexible Manufacturing Systems | | 3 | 0 | 0 | | 3 |
| 10 | | Design of Mechanisms and Manipulators | | 3 | 0 | 0 | | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **EV Semester 6** | | | | | | | |
| 1 | | EV/HEV Power Train | | 2 | 0 | 2 | | 3 |
| 2 | | EV drive and Control | | 2 | 0 | 2 | | 3 |
| | **EV Semester 7** | | | | | | | |
| 1 | | Energy storage, Battery BMS and BTMS | | 2 | 0 | 2 | | 3 |

| **Sl No** | **Course Code** | **Program Elective-1** | | **L** | **T** | **P** | | **C** |
|---|---|---|---|---|---|---|---|---|
| 1 | | Automotive Safety | | 3 | 0 | 0 | | 3 |
| 2 | | Fundamental of EV and HEV | | 3 | 0 | 2 | | 4 |
| 3 | | EV/HEV Power Train | | 3 | 0 | 2 | | 4 |
| 4 | | EV drive and Control | | 3 | 0 | 2 | | 4 |
| 5 | | AI and IoT Applications for Automotive Industry | | 3 | 0 | 2 | 1 | 5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6 | | Energy storage, Battery BMS and BTMS | | 3 | 0 | 2 | | 4 |
| 7 | | Intelligent Transport System | | 3 | 0 | 0 | | 3 |
| 8 | | Fundamental of Autonomus Vehicle | | 3 | 0 | 0 | | 3 |
| 9 | | Fundamental of Hydrogen & Fuel Cell | | 3 | 0 | 0 | | 3 |
| 10 | | In-Vehicle Networking | | 3 | 0 | 0 | | 3 |