**B.Sc. Mechanical Engineering**

(From 2017 Intake to 2018 Intake)

**1st Semester**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Knowledge Area** | **Pre-Requisite Courses** **(if any)** |
| **Theory** | **Lab** |
| GS-101 | Calculus and Analytical Geometry  | 3 | 0 | Natural Sciences | No |
| HS-101 | Functional English  | 2 | 0 | Humanities  | No |
| GS-102 | Applied Physics  | 2 | 0 | Natural Sciences | No |
| GS-103 | Applied Chemistry  | 2 | 0 | Natural Sciences | No |
| ME-111 | Engineering Statics  | 2 | 1 | Engineering Foundation | No |
| ME-131 | Workshop Practice  | 1 | 1 | Engineering Foundation | No |
|  | **Total:**  | **12** | **2** |  |  |
|  | **Semester Total for Theory & Lab** | **14** |  |  |

**2nd Semester**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Knowledge Area** | **Pre-Requisite Courses** **(if any)** |
| **Theory** | **Lab** |
| CS-101 | Computer Systems and Programming | 2 | 1 | Computing | No |
| EE-101 | Electrical Engineering  | 2 | 1 | Inter-Disciplinary | No |
| GS-104 | Linear Algebra and Ordinary Differential Equations  | 3 | 0 | Natural Sciences | No |
| ME-112 | Engineering Dynamics  | 3 | 1 | Engineering Foundation | No |
| ME-113 | Engineering Drawing and Graphics  | 2 | 1 | Engineering Foundation | No |
| ME-121 | Thermodynamics-I  | 3 | 1 | Engineering Foundation | No |
|  | **Total:**  | **15** | **5** |  |  |
|  | **Semester Total for Theory & Lab** | **20** |  |  |
|  | **Total for 1st Year**  | **34** |  |  |

**3rd Semester**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Knowledge Area** | **Pre-Requisite Courses** **(if any)** |
| **Theory** | **Lab** |
| IS-201 | Islamic Studies/Ethics | 2 | 0 | Humanities | No |
| GS-205 | Complex Variables and Transforms | 3 | 0 | Natural Sciences | No |
| ME-222 | Fluid Mechanics-I | 3 | 1 | Engineering Foundation | No |
| ME-214 | Mechanics of Materials-I | 2 | 1 | Engineering Foundation | No |
| ME-215 | Machine Design and CAD-I | 2 | 1 | Major Based Core (Breadth) | No |
| ME-223 | Thermodynamics-II | 2 | 1 | Major Based Core (Breadth) | No |
|  | **Total:**  | **14** | **4** |  |  |
|  | **Semester Total for Theory & Lab** | **18** |  |  |

**4th Semester**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course** **Code** | **Course Title** | **Credit Hours** | **Knowledge Area** | **Pre-Requisite Courses** **(if any)** |
| **Theory** | **Lab** |
| PS-201 | Pakistan Studies  | 2 | 0 | Humanities | No |
| EE-202 | Electronics Engineering  | 2 | 1 | Inter-Disciplinary | No |
| GS-206 | Numerical Analysis  | 3 | 0 | Natural Sciences | No |
| ME-216 | Engineering Materials  | 2 | 1 | Engineering Foundation | No |
| ME-217 | Mechanics of Materials-II  | 3 | 1 | Major Based Core (Breadth) | No |
| ME-224 | Fluid Mechanics-II  | 2 | 1 | Major Based Core (Breadth) | No |
|  | **Total:**  | **14** | 4 |  |  |
|  | **Semester Total for Theory & Lab** | **18** |  |  |
|  | **Total for Second Year**  | **36** |  |  |

**5th Semester**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Knowledge Area** | **Pre-Requisite Courses** **(if any)** |
| **Theory** | **Lab** |
| MS-301 | Engineering Economics  | 2 | 0 | Management Sciences | No |
| HS-302 | Technical Report Writing  | 2 | 0 | Humanities | No |
| ME-318 | Machine Design & CAD-II  | 3 | 1 | Major Based Core (Breadth) | No |
| ME-325 | Heat and Mass Transfer  | 3 | 1 | Major Based Core (Breadth) | No |
| ME-332 | Precision Engineering & Metrology  | 2 | 1 | Engineering Foundation | No |
| ME-333 | Manufacturing Processes-I  | 2 | 1 | Engineering Foundation | No |
|  | **Total**  | **14** | 4 |  |  |
|  | **Semester Total for Theory & Lab** | **18** |  |  |

**6th Semester**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Knowledge Area** | **Pre-Requisite Courses** **(if any)** |
| **Theory** | **Lab** |
| MS(Elec.)-3XY | Management Elective-I  | 2 | 0 | Management Sciences | No |
| HS-303 | Communication Skills  | 2 | 0 | Humanities | No |
| EE-303 | Control Engineering  | 2 | 1 | Major Based Core (Breadth) | No |
| GS-307 | Applied Statistics  | 2 | 0 | Natural Sciences | No |
| ME-319 | Mechanics of Machines  | 3 | 1 | Engineering Foundation | No |
| ME-326 | Refrigeration and Air Conditioning  | 2 | 1 | Major Based Core (Depth) | No |
|  | **Total:**  | **13** | **3** |  |  |
|  | **Semester Total for Theory & Lab** | **16** |  |  |
|  | **Total for Third Year**  | **34** |  |  |

**7th Semester**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Knowledge Area** | **Pre-Requisite Courses** **(if any)** |
| **Theory** | **Lab** |
| MS(Elec.)-4XY | Management Elective-II  | 2 | 0 | Management Sciences | No |
| ME-427 | Internal Combustion Engines  | 2 | 1 | Major Based Core (Depth) | No |
| ME-434 | Manufacturing Process-II  | 2 | 1 | Major Based Core (Breadth) | No |
| ME-41X | Mechanical Vibrations  | 3 | 1 | Major Based Core (Depth) | No |
| ME(Elec.)-4XY | Technical Elective-I  | 2 | 1 | Major Based Core (Depth) | No |
| ME-499 | Design Project  | 0 | 3 | Senior Design Project | No |
|  | **Total**  | **11** | **7** |  |  |
|  | **Semester Total for Theory & Lab** | 18 |  |  |  |

**8th Semester**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Credit Hours** | **Knowledge** **Area** | **Pre-Requisite Courses** **(if any)** |
| **Theory** | **Lab** |
| HS-404 | Social Sciences  | 2 | 0 | Humanities | No |
| ME(Elec.)- 4XY | Technical Elective-II  | 2 | 1 | Major Based Core (Depth) | No |
| ME(Elec.)- 4XY | Technical Elective-III  | 2 | 1 | Major Based Core (Depth) | No |
| ME(Elec.)-4XY | Technical Elective-IV  | 2 | 1 | Major Based Core (Depth) | No |
| ME-499 | Design Project  | 0 | 3 | Senior Design Project | No |
|  | **Total:**  | **8** | **6** |  |  |
|  | **Semester Total for Theory & Lab** | **14** |  |  |
|  | **Total for Final Year**  | **32** |  |  |
|  | **Grand Total for Four Years**  | **136** |  |  |

**List of Electives**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Area of Specialization** | **Sr. No.** | **Course Code** | **Course Title** | **Credit Hours** | **Knowledge** **Area** | **Pre-Requisite Courses** **(if any)** |
| **Applied Mechanics and Design** | 1 | ME(Elec.)-41\_ | Tribology | 2+1 | Major Based Core (Depth) | No |
| 2 | ME(Elec.)-41\_ | Mechanical Engineering Design Analysis | 2+1 | Major Based Core (Depth) | No |
| 3 | ME(Elec.)-41\_ | Stress Analysis | 2+1 | Major Based Core (Depth) | No |
| 4 | ME(Elec.)-41\_ | Composite Materials | 2+1 | Major Based Core (Depth) | No |
| **Thermo-Fluids** | 1 | ME(Elec.)-42\_ | Power Plants | 2+1 | Major Based Core (Depth) | No |
| 2 | ME(Elec.)-42\_ | Renewable Energy Technology | 2+1 | Major Based Core (Depth) | No |
| 3 | ME(Elec.)-42\_ | Gas Dynamics | 2+1 | Major Based Core (Depth) | No |
| 4 | ME(Elec.)-42\_ | Aerodynamics | 2+1 | Major Based Core (Depth) | No |
| 5 | ME(Elec.)-42\_ | Computational Fluid Dynamics (CFD) | 2+1 | Major Based Core (Depth) | No |
| 6 | ME(Elec.)-42\_ | Nuclear Engineering | 2+1 | Major Based Core (Depth) | No |
| 7 | ME(Elec.)-42\_ | Automotive Engineering | 2+1 | Major Based Core (Depth) | No |
| **Manufacturing Systems** | 1 | ME(Elec.)-43\_ | Advanced Manufacturing Systems | 2+1 | Major Based Core (Depth) | No |
| 2 | ME(Elec.)-43\_ | Introduction to Mechatronics | 2+1 | Major Based Core (Depth) | No |
| 3 | ME(Elec.)-43\_ | Robotics | 2+1 | Major Based Core (Depth) | No |
| 4 | ME(Elec.)-43\_ | Maintenance Engineering | 2+1 | Major Based Core (Depth) | No |
| **Management Sciences** | 1 | MS(Elec.)-40\_ | Operations Management | 2+0 | Management Sciences | No |
| 2 | MS(Elec.)-40\_ | Total Quality Management | 2+0 | Management Sciences | No |
| 3 | MS(Elec.)-40\_ | Project Management | 2+0 | Management Sciences | No |
| 4 | MS(Elec.)-40\_ | Operations Research | 2+0 | Management Sciences | No |
| 5 | MS(Elec.)-40\_ | Engineering Law | 2+0 | Management Sciences | No |
| 6 | MS(Elec.)-40\_ | Entrepreneur ship | 2+0 | Management Sciences | No |
| 7 | MS(Elec.)-40\_ | Safety Health and Environment | 2+0 | Management Sciences | No |
| 8 | MS(Elec.)-40\_ | Supply Chain Management | 2+0 | Management Sciences | No |