

## Scheme of Studies for Mechanical Engineering Curriculum 2025

### First Semester

| Sr. No.      | Course Code | Course Title                     | (Credit Hours) |          | Total Credit Hours |
|--------------|-------------|----------------------------------|----------------|----------|--------------------|
|              |             |                                  | Theory         | Lab      |                    |
| 1.           | HU-101      | Functional English               | 3              | 0        | 3                  |
| 2.           | NS-101      | Calculus and Analytical Geometry | 3              | 0        | 3                  |
| 3.           | HU-102      | Islamic Studies / Ethics         | 2              | 0        | 2                  |
| 4.           | HU-103      | Civics and Community Engagement  | 2              | 0        | 2                  |
| 5.           | NS-102      | Applied Physics                  | 2              | 1        | 3                  |
| 6.           | ME-111      | Engineering Drawing and Graphics | 1              | 1        | 2                  |
| 7.           | ME-131      | Workshop Practice                | 1              | 1        | 2                  |
| 8.           | HU-105      | Understanding of Holy Quran-I    | 1              | 0        | 1                  |
| <b>Total</b> |             |                                  | <b>15</b>      | <b>3</b> | <b>18</b>          |

| <b>Second Semester</b>      |                    |                                         |                       |            |                           |
|-----------------------------|--------------------|-----------------------------------------|-----------------------|------------|---------------------------|
| <b>Sr. No.</b>              | <b>Course Code</b> | <b>Course Title</b>                     | <b>(Credit Hours)</b> |            | <b>Total Credit Hours</b> |
|                             |                    |                                         | <b>Theory</b>         | <b>Lab</b> |                           |
| 1.                          | NS-103             | Linear Algebra & Differential Equations | 3                     | 0          | 3                         |
| 2.                          | MDE-101            | Electrical Engineering                  | 2                     | 0          | 2                         |
| 3.                          | ME-112             | Computer Aided Drawing                  | 0                     | 1          | 1                         |
| 4.                          | ME-113             | Engineering Mechanics-I: (Statics)      | 3                     | 0          | 3                         |
| 5.                          | ME-121             | Thermodynamics-I                        | 3                     | 0          | 3                         |
| 6.                          | ME-115             | Materials Engineering                   | 2                     | 0          | 2                         |
| 7.                          | CS-101             | Applications of ICT                     | 2                     | 1          | 3                         |
| 8.                          | HU-104             | Ideology and Constitution of Pakistan   | 2                     | 0          | 2                         |
| <b>Total</b>                |                    |                                         | <b>17</b>             | <b>2</b>   | <b>19</b>                 |
| <b>Total for First Year</b> |                    |                                         | <b>37</b>             |            |                           |

| <b>2<sup>nd</sup> Year</b> |                    |                                       |                       |            |                           |
|----------------------------|--------------------|---------------------------------------|-----------------------|------------|---------------------------|
| <b>Third Semester</b>      |                    |                                       |                       |            |                           |
| <b>Sr. No.</b>             | <b>Course Code</b> | <b>Course Title</b>                   | <b>(Credit Hours)</b> |            | <b>Total Credit Hours</b> |
|                            |                    |                                       | <b>Theory</b>         | <b>Lab</b> |                           |
| <b>1.</b>                  | ME-211             | Engineering Mechanics -II: (Dynamics) | 2                     | 0          | 2                         |
| <b>2.</b>                  | ME-212             | Mechanics of Materials-I              | 3                     | 0          | 3                         |
| <b>3.</b>                  | CS-201             | Computer Systems and Programming      | 2                     | 1          | 3                         |
| <b>4.</b>                  | NS-201             | Complex Variables & Transforms        | 3                     | 0          | 3                         |
| <b>5.</b>                  | ME-221             | Fluid Mechanics-I                     | 3                     | 0          | 3                         |
| <b>6.</b>                  | ME-222             | Thermodynamics-II                     | 2                     | 0          | 2                         |
| <b>7.</b>                  | ME-213             | Engineering Mechanics Lab             | 0                     | 1          | 1                         |
| <b>8.</b>                  | ME-223             | Thermodynamics Lab                    | 0                     | 1          | 1                         |
| <b>Total</b>               |                    |                                       | <b>15</b>             | <b>3</b>   | <b>18</b>                 |

| <b>Fourth Semester</b>       |                    |                                            |                       |            |                           |
|------------------------------|--------------------|--------------------------------------------|-----------------------|------------|---------------------------|
| <b>Sr. No.</b>               | <b>Course Code</b> | <b>Course Title</b>                        | <b>(Credit Hours)</b> |            | <b>Total Credit Hours</b> |
|                              |                    |                                            | <b>Theory</b>         | <b>Lab</b> |                           |
| 1.                           | ME-214             | Measurement and Instrumentation            | 2                     | 0          | 2                         |
| 2.                           | ME-215             | Mechanics of Materials-II                  | 3                     | 0          | 3                         |
| 3.                           | ME-224             | Fluid Mechanics-II                         | 2                     | 0          | 2                         |
| 4.                           | ME-311             | Mechanics of Machines                      | 2                     | 0          | 2                         |
| 5.                           | MDE-201            | Electronics Engineering                    | 2                     | 0          | 2                         |
| 6.                           | MDE-202            | Electrical and Electronics Engineering Lab | 0                     | 1          | 1                         |
| 7.                           | HU-201             | Expository Writing                         | 3                     | 0          | 3                         |
| 8.                           | ME-225             | Fluid Mechanics Lab                        | 0                     | 1          | 1                         |
| 9.                           | ME-217             | Mechanics of Materials Lab                 | 0                     | 1          | 1                         |
| <b>Total</b>                 |                    |                                            | <b>14</b>             | <b>03</b>  | <b>17</b>                 |
| <b>Total for Second Year</b> |                    |                                            | <b>35</b>             |            |                           |

| <b>3<sup>rd</sup> Year</b> |                    |                                                    |                       |            |                           |
|----------------------------|--------------------|----------------------------------------------------|-----------------------|------------|---------------------------|
| <b>Fifth Semester</b>      |                    |                                                    |                       |            |                           |
| <b>Sr. No.</b>             | <b>Course Code</b> | <b>Course Title</b>                                | <b>(Credit Hours)</b> |            | <b>Total Credit Hours</b> |
|                            |                    |                                                    | <b>Theory</b>         | <b>Lab</b> |                           |
| <b>1.</b>                  | ME-331             | Manufacturing Processes                            | 2                     | 0          | 2                         |
| <b>2.</b>                  | ME-332             | Manufacturing Processes Lab                        | 0                     | 1          | 1                         |
| <b>3.</b>                  | HU-301             | Social Sciences Elective**                         | 2                     | 0          | 2                         |
| <b>4.</b>                  | ME-216             | Machine Design-I                                   | 2                     | 0          | 2                         |
| <b>5.</b>                  | ME-321             | Heat & Mass Transfer                               | 3                     | 0          | 3                         |
| <b>6.</b>                  | CS-301             | Applied Artificial Intelligence & Machine Learning | 2                     | 1          | 3                         |
| <b>7.</b>                  | ME-313             | M&I and Control Lab                                | 0                     | 1          | 1                         |
| <b>8.</b>                  | NS-301             | Numerical Analysis                                 | 2                     | 1          | 3                         |
| <b>Total</b>               |                    |                                                    | <b>13</b>             | <b>4</b>   | <b>17</b>                 |

| <b>Sixth Semester</b> |                    |                                                |                       |            |                           |
|-----------------------|--------------------|------------------------------------------------|-----------------------|------------|---------------------------|
| <b>Sr. No.</b>        | <b>Course Code</b> | <b>Course Title</b>                            | <b>(Credit Hours)</b> |            | <b>Total Credit Hours</b> |
|                       |                    |                                                | <b>Theory</b>         | <b>Lab</b> |                           |
| 1.                    | ME-312             | Control Engineering                            | 2                     | 0          | 2                         |
| 2.                    | ME-322             | Heating, Ventilating and Air Conditioning      | 3                     | 0          | 3                         |
| 3.                    | ME-314             | Machine Design-II                              | 2                     | 0          | 2                         |
| 4.                    | ME-315             | Finite Element Methods                         | 2                     | 1          | 3                         |
| 5.                    | ME-323             | HVAC and H&M Lab                               | 0                     | 1          | 1                         |
| 6.                    | NS-302/<br>NS-XXY  | Probability & Stochastic/<br>Math Elective *** | 3                     | 0          | 3                         |
| 7.                    | MS-301             | Project Management                             | 2                     | 0          | 2                         |
| 8.                    | HU-302             | Fehm-Quran-II                                  | 1                     | 0          | 1                         |
| <b>Total</b>          |                    |                                                | <b>15</b>             | <b>2</b>   | <b>17</b>                 |

| <b>4<sup>th</sup> Year</b> |                    |                                         |                       |            |                           |
|----------------------------|--------------------|-----------------------------------------|-----------------------|------------|---------------------------|
| <b>Seven Semester</b>      |                    |                                         |                       |            |                           |
| <b>Sr. No.</b>             | <b>Course Code</b> | <b>Course Title</b>                     | <b>(Credit Hours)</b> |            | <b>Total Credit Hours</b> |
|                            |                    |                                         | <b>Theory</b>         | <b>Lab</b> |                           |
| 1.                         | HU-401             | Pakistan Studies                        | 2                     | 0          | 2                         |
| 2.                         | ME-411             | Mechanical Vibrations                   | 3                     | 0          | 3                         |
| 3.                         | ME-421             | Internal Combustion Engines             | 2                     | 1          | 3                         |
| 4.                         | ME-XXY             | Technical Elective-I****                | 3/2                   | 0/1        | 3                         |
| 5.                         | HU-XXY             | Arts and Humanities Elective*           | 2                     | 0          | 2                         |
| 6.                         | ME-412             | Mechanisms and Mechanical Vibration Lab | 0                     | 1          | 1                         |
| 7.                         | ME-499-A           | Final Year Design Project-I             | 0                     | 3          | 3                         |
| <b>Total</b>               |                    |                                         | <b>12/11</b>          | <b>5/6</b> | <b>17</b>                 |

| <b>Eighth Semester</b>    |                    |                                               |                       |            |                           |
|---------------------------|--------------------|-----------------------------------------------|-----------------------|------------|---------------------------|
| <b>Sr. No.</b>            | <b>Course Code</b> | <b>Course Title</b>                           | <b>(Credit Hours)</b> |            | <b>Total Credit Hours</b> |
|                           |                    |                                               | <b>Theory</b>         | <b>Lab</b> |                           |
| 1.                        | ME-413             | Reverse Engineering and Inspection Techniques | 2                     | 1          | 3                         |
| 2.                        | ME-414             | Mechatronics & Robotics Engineering           | 2                     | 1          | 3                         |
| 3.                        | ME-XXY             | Technical Elective-II****                     | 3/2                   | 0/1        | 3                         |
| 4.                        | MS-401             | Entrepreneurship                              | 2                     | 0          | 2                         |
| 5.                        | MDE-401            | Occupational Health & Safety                  | 1                     | 0          | 1                         |
| 6.                        | ME-499-B           | Final Year Design Project-II                  | 0                     | 3          | 3                         |
| <b>Total</b>              |                    |                                               | <b>10/9</b>           | <b>5/6</b> | <b>15</b>                 |
| <b>Total Credit Hours</b> |                    |                                               |                       |            | <b>138</b>                |

| <b>List of Arts and Humanities Electives (2+0)</b>                                                                                                                                                                                                                                                                                                                     | <b>**List of Social Sciences Electives (2+0)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>***List of Mathematics Electives</b>                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Communion and Presentation Skills</li> <li>• Beginner Spanish</li> <li>• Elementary Arabic</li> <li>• Elementary French</li> <li>• Elementary Chinese</li> <li>• History</li> <li>• Philosophy</li> <li>• Professional Ethics</li> <li>• Any other relevant course/language decided by the HEI as per requirement.</li> </ul> | <ul style="list-style-type: none"> <li>• Sociology for Engineers</li> <li>• Sociology</li> <li>• Social Physiology</li> <li>• Critical Thinking</li> <li>• Human Resource Management</li> <li>• Organizational Behavior</li> <li>• Engineering Law</li> <li>• Engineering Economics</li> <li>• Applied Psychology</li> <li>• Engineering Management</li> <li>• Financial Management</li> <li>• Marketing Management</li> <li>• Leadership and Personal Grooming</li> <li>• Any other relevant course decided</li> </ul> | <ul style="list-style-type: none"> <li>• Applied Statistics</li> <li>• Probability and Stochastic</li> <li>• Multivariable Calculus</li> <li>• Any other relevant course decided by the HEI as per requirement</li> </ul> |

**\*\*\*List of Technical Electives (03 Credit Hrs.)**

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| <ul style="list-style-type: none"><li>• Tribology</li><li>• Mechanical Engineering Design Analysis</li><li>• Stress Analysis</li><li>• Composite Materials</li><li>• Renewable Energy Technology</li><li>• Gas Dynamics</li><li>• Aerodynamics</li><li>• Computational Fluid Dynamics</li></ul> | <ul style="list-style-type: none"><li>• Nuclear Engineering</li><li>• Automotive Engineering</li><li>• Advanced Manufacturing Systems</li><li>• Maintenance Engineering</li><li>• Product Design and Development</li><li>• Micro-Electromechanical Systems (MEMS)</li><li>• Power Plant</li><li>• Any other relevant course decided by the HEI as per requirement</li></ul> |
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