

Sardar Patel College of Engineering Andheri (West), Mumbai 400 058  
Year: 2026-27



**Bharatiya Vidya Bhavan's**  
**SARDAR PATEL COLLEGE OF ENGINEERING**

(Government Aided Autonomous Institute under Mumbai University)

Andheri (W), Mumbai - 400058



M.Tech. in Mechanical Engineering with  
Machine Design Courses

**Academic Course Credit and Evaluation Scheme**

**Year: 2026-2027**

Regulation 2023 (R23)

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**  
**Year: 2026-27**

| Scheme for F.Y.M.Tech. in Mechanical Engineering with Machine Design Courses, (Semester - I) R23<br>Academic Year 2026-27 |                                |            |                            |    |    |               |         |                                 |            |    |                                  |            |                            |                       |              |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------|----------------------------|----|----|---------------|---------|---------------------------------|------------|----|----------------------------------|------------|----------------------------|-----------------------|--------------|
| Sr No                                                                                                                     | Course Name                    | Code       | Course Plan per Week (Hrs) |    |    | SL/Sem. (Hrs) | Credits | In semester Evaluation (Points) |            |    | End Semester Evaluation (Points) |            | End semester weightage (%) | Term work / Practical | Total Points |
|                                                                                                                           |                                |            | L                          | P  | T  |               |         | Mid term                        | Time (Hrs) | IE | Points                           | Time (Hrs) |                            |                       |              |
|                                                                                                                           | Core Courses                   |            |                            |    |    |               |         |                                 |            |    |                                  |            |                            |                       |              |
| 1                                                                                                                         | Advanced Stress Analysis       | PC-MTMD101 | 3                          | -- | -- | 48            | 3       | 30                              | 1.5        | 20 | 100                              | 3          | 50%                        | 0                     | 100          |
| 2                                                                                                                         | Computer Aided Design          | PC-MTMD102 | 3                          | -- | -- | 48            | 3       | 30                              | 1.5        | 20 | 100                              | 3          | 50%                        | 0                     | 100          |
| 3                                                                                                                         | Research Methodology and IPR   | PC-MTMD103 | 2                          | -- | 1  | 48            | 3       | 30                              | 1.5        | 20 | 100                              | 3          | 50%                        | 0                     | 100          |
| Program Elective Courses                                                                                                  |                                |            |                            |    |    |               |         |                                 |            |    |                                  |            |                            |                       |              |
| 4                                                                                                                         | Program Elective-I             | PE-MTMD**  | 3                          | -- | -- | 48            | 3       | 30                              | 1.5        | 20 | 100                              | 3          | 50%                        | 0                     | 100          |
| 5                                                                                                                         | Program Elective-II            | PE-MTMD**  | 3                          | -- | -- | 48            | 3       | 30                              | 1.5        | 20 | 100                              | 3          | 50%                        | 0                     | 100          |
| 6                                                                                                                         | Program Elective-III           | PE-MTMD**  | 3                          | -- | -- | 48            | 3       | 30                              | 1.5        | 20 | 100                              | 3          | 50%                        | 0                     | 100          |
| Laboratory Courses                                                                                                        |                                |            |                            |    |    |               |         |                                 |            |    |                                  |            |                            |                       |              |
| 7                                                                                                                         | Design Lab-I                   | PC-MTMD151 | --                         | 4  | -- | 32            | 2       | --                              | --         | 25 | 25                               | --         | 100%                       | --                    | 50           |
| 8                                                                                                                         | Design Lab-II                  | PC-MTMD152 | --                         | 4  | -- | 32            | 2       | --                              | --         | 25 | 25                               | --         | 100%                       | --                    | 50           |
| Indian Knowledge System Course                                                                                            |                                |            |                            |    |    |               |         |                                 |            |    |                                  |            |                            |                       |              |
| 9                                                                                                                         | Indian Knowledge System Course | IK-MTMD#   | 2                          | -- | -- | 32            | 2       | 30                              | 1.0        | 20 | 50                               | 2          | 100%                       | 0                     | 100          |
|                                                                                                                           | TOTAL                          |            |                            |    |    |               | 24      |                                 |            |    |                                  |            |                            |                       |              |

L: Lecture, T: Tutorial, P: Practical, SL: Self Learning

**1 credit corresponds to 30 Hours of student engagement in a semester. Apart from actual contact hours (L T P), the remaining hours are used for term work and self-learning by students.**

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**  
**Year: 2026-27**

| Scheme for F.Y.M.Tech. in Mechanical Engineering with Machine Design Courses, (Semester - II) R23<br>Academic Year 2026-27 |                                                |             |                                  |    |    |                  |         |                                    |               |     |                                        |               |                                     |                             |                 |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------|----------------------------------|----|----|------------------|---------|------------------------------------|---------------|-----|----------------------------------------|---------------|-------------------------------------|-----------------------------|-----------------|
| Sr.<br>No.                                                                                                                 | Course Name                                    | Code        | Course Plan<br>per Week<br>(Hrs) |    |    | SL/Sem.<br>(Hrs) | Credits | In semester<br>Evaluation (Points) |               |     | End Semester<br>Evaluation<br>(Points) |               | End<br>semester<br>weightage<br>(%) | Term<br>work /<br>Practical | Total<br>Points |
|                                                                                                                            |                                                |             | L                                | P  | T  |                  |         | Mid<br>Term                        | Time<br>(Hrs) | IE  | Points                                 | Time<br>(Hrs) |                                     |                             |                 |
| Core Courses                                                                                                               |                                                |             |                                  |    |    |                  |         |                                    |               |     |                                        |               |                                     |                             |                 |
| 1                                                                                                                          | System Modeling and<br>Synthesis of Mechanisms | PC-MTMD201  | 3                                | 0  | 0  | 48               | 3       | 30                                 | 1.5           | 20  | 100                                    | 3             | 50%                                 | 0                           | 100             |
| 2                                                                                                                          | Advance Finite Element<br>Methods              | PC-MTMD202  | 3                                | 0  | 0  | 48               | 3       | 30                                 | 1.5           | 20  | 100                                    | 3             | 50%                                 | 0                           | 100             |
| 3                                                                                                                          | Seminar/ Mini Project                          | PC-MTMD 203 | --                               | 4  | -- | 4                | 2       | --                                 | --            | 50* | 50*                                    | --            | 100%                                | --                          | 100*            |
| Program Elective Course                                                                                                    |                                                |             |                                  |    |    |                  |         |                                    |               |     |                                        |               |                                     |                             |                 |
| 4                                                                                                                          | Program Elective-IV                            | PE-MTMD201- | 3                                | -- | 1  | 64               | 4       | 30                                 | 1.5           | 20  | 100                                    | 3             | 50%                                 | 0                           | 100             |
| 5                                                                                                                          | Program Elective-V                             | PE-MTMD201- | 3                                | -- | 1  | 64               | 4       | 30                                 | 1.5           | 20  | 100                                    | 3             | 50%                                 | 0                           | 100             |
| Open Elective Course                                                                                                       |                                                |             |                                  |    |    |                  |         |                                    |               |     |                                        |               |                                     |                             |                 |
| 6                                                                                                                          | Open Elective                                  | OE-MTMD#    | 3                                | -- | -- | 48               | 3       | 30                                 | 1.5           | 20  | 100                                    | 3             | 50%                                 | 0                           | 100             |
| Vocational and Skill Enhancement                                                                                           |                                                |             |                                  |    |    |                  |         |                                    |               |     |                                        |               |                                     |                             |                 |
| 7                                                                                                                          | Skill Based Design Lab-I                       | SE-MTMD201  | --                               | 4  | -- | 32               | 2       | -                                  | -             | 25  | 25                                     | --            | 100%                                | --                          | 50              |
| 8                                                                                                                          | Skill Based Design Lab-II                      | SE-MTMD202  | --                               | 4  | -- | 32               | 2       | -                                  | -             | 25  | 25                                     | --            | 100%                                | --                          | 50              |
| Ability Enhancement Course                                                                                                 |                                                |             |                                  |    |    |                  |         |                                    |               |     |                                        |               |                                     |                             |                 |
| 9                                                                                                                          | Ability Enhancement<br>Course                  | AE-MTMD#    | 2                                |    |    | 32               | 2       | 30                                 | 1.5           | 20  | 100                                    | 3             | 50%                                 | 0                           | 100             |
|                                                                                                                            | TOTAL                                          |             |                                  |    |    |                  | 25      |                                    |               |     |                                        |               |                                     |                             |                 |

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**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**Year: 2026-27**

| Scheme for F.Y.M.Tech. in Mechanical Engineering with Machine Design Courses, (Semester - III) R23<br>Academic Year 2026-27 |                                       |             |                            |   |   |               |         |                                                                                  |            |      |                                  |            |                            |                       |              |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------|----------------------------|---|---|---------------|---------|----------------------------------------------------------------------------------|------------|------|----------------------------------|------------|----------------------------|-----------------------|--------------|
| Sr. No.                                                                                                                     | Course Name                           | Code        | Course Plan per Week (Hrs) |   |   | SL/Sem. (Hrs) | Credits | In semester Evaluation (Points)                                                  |            |      | End Semester Evaluation (Points) |            | End semester weightage (%) | Term work / Practical | Total Points |
|                                                                                                                             |                                       |             | L                          | P | T |               |         | Mid Term                                                                         | Time (Hrs) | IE   | Points                           | Time (Hrs) |                            |                       |              |
| Value Education Course                                                                                                      |                                       |             |                            |   |   |               |         |                                                                                  |            |      |                                  |            |                            |                       |              |
| 1                                                                                                                           | Value Education Course                | VE-MTMD301  | 2                          | - | - | 32            | 2       | 30                                                                               | 1.5        | 20   | 100                              | 03         | 50%                        | 0                     | 100          |
| Field or Community Engagement Project                                                                                       |                                       |             |                            |   |   |               |         |                                                                                  |            |      |                                  |            |                            |                       |              |
| 2                                                                                                                           | Field or Community Engagement Project | CEP-MTMD301 |                            | 4 |   |               | 2       | Continuos evaluation shall be defined by course instructor or activity evaluator |            |      |                                  |            |                            |                       | 100          |
| Internship or Project                                                                                                       |                                       |             |                            |   |   |               |         |                                                                                  |            |      |                                  |            |                            |                       |              |
| 3                                                                                                                           | Internship /Dissertaion               | DS-MTMD 301 | 4 <sup>#</sup> +38         |   |   |               | 14      |                                                                                  |            | 100* | 200 <sup>S</sup>                 |            |                            |                       | 300          |
|                                                                                                                             | TOTAL                                 |             |                            |   |   |               | 18      |                                                                                  |            |      |                                  |            |                            |                       | 500          |

L: Lecture, T: Tutorial, P: Practical, SL: Self Learning

**1 credit corresponds to 30 Hours of student engagement in a semester. Apart from actual contact hours (L T P), the remaining hours are used for term wok and self-learning by students.**

**Note:**

# - Contact hours with supervisor/mentor/guide = 4

\* - Evaluation shall be based on one or more presentations during the semester. 50% weightage shall be for the report and remaining 50% shall be for presentations. The evaluation shall be carried out by the allotted guide and at least one internal examiner

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**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**

**Year: 2026-27**

| Scheme for F.Y.M.Tech. in Mechanical Engineering with Machine Design Courses, (Semester - IV) R23<br>Academic Year 2026-27 |                                                          |             |                            |   |    |         |                                                                                     |            |      |                                  |            |                            |                       |              |
|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------|----------------------------|---|----|---------|-------------------------------------------------------------------------------------|------------|------|----------------------------------|------------|----------------------------|-----------------------|--------------|
| Sr. No.                                                                                                                    | Course Name                                              | Code        | Course Plan per Week (Hrs) |   |    | Credits | In semester Evaluation (Points)                                                     |            |      | End Semester Evaluation (Points) |            | End semester weightage (%) | Term work / Practical | Total Points |
|                                                                                                                            |                                                          |             | L                          | P | T  |         | Mid Term                                                                            | Time (Hrs) | IE   | Points                           | Time (Hrs) |                            |                       |              |
| Cocurricular Activity                                                                                                      |                                                          |             |                            |   |    |         |                                                                                     |            |      |                                  |            |                            |                       |              |
| 1                                                                                                                          | Co curricular course/activity/ Stress Management by Yoga | CC-MTMD401  | -                          | - | 1  | 1       | \$ Continuos evaluation shall be defined by course instructor or activity evaluator |            |      |                                  |            |                            |                       | 100          |
| Internship or Project                                                                                                      |                                                          |             |                            |   |    |         |                                                                                     |            |      |                                  |            |                            |                       |              |
| 2                                                                                                                          | Dissertation                                             | DS-MTMD 401 | 4 <sup>#</sup> +38         |   |    | 14      |                                                                                     |            | 100* | 200 <sup>\$</sup>                |            |                            |                       | 300          |
|                                                                                                                            | TOTAL                                                    |             | 04                         | - | 25 | 15      |                                                                                     |            |      |                                  |            |                            |                       | 400          |

**Note:**

# - Contact hours with supervisor/mentor/guide = 4

\* - Evaluation shall be based on one or more presentations during the semester. 50% weightage shall be for the report and remaining 50% shall be for presentations. The evaluation shall be carried out by the allotted guide and atleast one internal examiner

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**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058****Year: 2026-27****List of Program Elective – I, II, III, IV and V Courses (PC-MTMD\$)**

| <b>Sr. No.</b> | <b>Code</b> | <b>Elective</b>                                   | <b>Sr. No.</b> | <b>Code</b> | <b>Elective</b>                             |
|----------------|-------------|---------------------------------------------------|----------------|-------------|---------------------------------------------|
| 1.             | PE-MTMD01   | Machine Dynamics and Advance Vibration            | 9.             | PE-MTMD09   | Entrepreneurship Development and Management |
| 2.             | PE-MTMD02   | Additive Manufacturing                            | 10.            | PE-MTMD10   | Design of Power Transmission Systems        |
| 3.             | PE-MTMD03   | Design for Manufacturing and Assembly             | 11.            | PE-MTMD11   | Optimization Techniques in Design           |
| 4.             | PE-MTMD04   | Tribology in Design                               | 12.            | PE-MTMD12   | Advanced Engineering Materials              |
| 5.             | E-MTMD05    | Reliability Engineering and Design of Experiments | 13.            | PE-MTMD13   | Mechanics of Composite Materials            |
| 6.             | PE-MTMD06   | System Modeling and Analysis                      | 14.            | PE-MTMD14   | Robotics                                    |
| 7.             | PE-MTMD07   | Pressure Vessel Design                            | 15.            | PE-MTMD15   | Advance Fracture Mechanics                  |
| 8.             | PE-MTMD08   | Micro Electro Mechanical Systems                  |                |             |                                             |

**List of Indian Knowledge System**

| <b>Sr. No.</b> | <b>Code</b> | <b>Audit Courses</b>  | <b>Sr. No.</b> | <b>Code</b> | <b>Audit Courses</b>         |
|----------------|-------------|-----------------------|----------------|-------------|------------------------------|
| 1              | IK-MTMD101  | Constitution of India | 2              | IK-MTMD102  | Related NPTEL/SWAYAM Courses |

**List of Ability Enhancement Courses (AE-MTMD#)**

| <b>Sr. No.</b> | <b>Code</b> | <b>Audit Courses</b>                                       | <b>Sr. No.</b> | <b>Code</b> | <b>Audit Courses</b>         |
|----------------|-------------|------------------------------------------------------------|----------------|-------------|------------------------------|
| 1              | AE-MTMD201  | English For Technical Writing                              | 4              | AE-MTMD203  | Pedagogy Studies             |
| 2              | AE-MTMD202  | Personality Development through Life Enlightenment Skills. | 5              | AE-MTMD204  | Related NPTEL/SWAYAM Courses |

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**  
**Year: 2026-27**

**List of Value Education Course**

| <b>Sr. No.</b> | <b>Code</b> | <b>Audit Courses</b> | <b>Sr. No.</b> | <b>Code</b> | <b>Audit Courses</b> |
|----------------|-------------|----------------------|----------------|-------------|----------------------|
| 1              | VE-MTMD301  | Disaster Management  | 2              | VE-MTMD302  | Value Education      |

**List of Open Elective Courses (OE-MTMD-#)**

| <b>Sr. No.</b> | <b>Code</b> | <b>Course</b>                           | <b>Sr. No.</b> | <b>Code</b> | <b>Course</b>                      |
|----------------|-------------|-----------------------------------------|----------------|-------------|------------------------------------|
| 1              | OE-MTMD201  | Industrial Safety                       | 2              | OE-MTMD202  | Operations Research                |
| 3              | OE-MTMD203  | Cost Management of Engineering Projects | 4              | OE-MTMD204  | Waste to Energy                    |
| 5              | OE-MTMD205  | Internet of things (IoT)                | 6              | OE-MTMD206  | Introduction to Big Data Analytics |
| 7              | OE-MTMD207  | Introduction to AI and Machine Learning | 8              | OE-MTMD208  | Introduction to Augmented Reality  |
| 9              | OE-MTMD209  | Composite Materials                     | 10             | OE-MTMD210  | Digital Twin                       |
| 11             | OE-MTMD211  | Industry 4.0                            | 12             | OE-MTMD212  | Generative Design                  |
| 13             | OE-MTMD213  | NPTEL/SWAYAM Courses                    | 14             |             |                                    |

### Evaluation for\_R23

1. For passing, student must secure minimum 50% marks in each course with all heads of passing taken together and minimum 50% marks in the end semester examination.

2. Department will offer online course as Program Elective or Open Elective courses subject to availability of a course on <https://swayam.gov.in/>, and NPTEL and availability of internal resources. The assessment criteria for these courses will be as per swayam / NPTEL. After evaluation grades will be awarded as per institute criteria. 2, 3 Credits will be assigned for online courses of 8 and 12 weeks respectively.

3. Assessment criteria for Laboratory/Tutorial work i.e. weightage for assessment shall be as follows: (i) Participation in Laboratory/Tutorial = 20% (ii) Journal/Drawing sheet/Sketch book = 40% (iii) MCQ/oral/test = 40% (5) L – Lecture P – Lab T - Tutorial

\* 50 Marks for seminar / mini project evaluation and 50 for presentation. The seminar / mini project report should be evaluated by supervisor and at least one internal examiner.

\* Note 1: 50 Marks for seminar / mini project evaluation and 50 for presentation. Note 2: The seminar report should be evaluated by supervisor and at least one internal examiner.

4. Mid-Semester: The courses under the category “Theory courses (PC, PE, OE)” and “Ability Enhancement Courses (AE)”. The evaluation is based on Mid Term Exam having 30% weightage. Any change in the same will be informed by the course instructor.

The courses under the category “Skill Enhancement”, “Value Education” and Indian Knowledge system”, the evaluation is based on activity , lab work, Presentation, Test, Mini project, Field project, Practical Examination, viva. This evaluation shall be conducted by course instructor.

5. IE: Internal Evaluation will be carried out by course instructor for 20 points. It is the continuous evaluation throughout the semester.

The evaluation will be based on minimum three of the following activities decided by course instructor. The maximum points that can be assigned to one activity will be 07. The course instructor needs to inform the students and head of the department about the activities those will be considered for IE and the points assigned to them in first week of semester. The course instructor will submit the internal evaluation points (out of 20 with activity wise break up) to examination section before the beginning of End Semester examination.

List of Activities: 1. Class Involvement 2. Assignments 3. Problem Solving 4. Mini project 5. Quizzes 6. Presentation 7. Oral

6. End semester evaluation: The courses under the category “Theory courses” and “Ability Enhancement Courses”. The evaluation is based on End semester examination of 100 points. **The end semester examination will cover all the modules of the course content.**

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**Year: 2026-27**

The courses under the category “Skill Enhancement”, “Value Education” and “Indian knowledge system”, the evaluation is based on lab assignment/ activity (Presentation, Test, Mini project, Field project, Practical Examination).

7. \$\$\$\$ The evaluation for Co-curricular course/ activity shall be defined by course instructor or activity evaluator. The evaluation of points shall be carried out throughout the semester and the grade Pass/ No pass will be awarded which will not be considered for CPI calculation.

**Note: Refer Academic and Examination rules and regulations for further details.**