

S.Y.B.Tech. in Mechanical Engineering
Course Credit System (Regulation 2018)

NOTES:

- (1) Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details.
- (2) Assessment criteria for laboratory/Tutorial work. i.e. weightage for assessment shall be as follows: (i) Attendance in Laboratory/Tutorial = 20%, (ii) Journal/Drawing sheet/Sketch book = 40%, (iii) MCQ/Oral/Test = 40%.
- (3) Laboratory course is considered as a separate head of passing.
- (4) The Mandatory courses are with Pass (P) and No Pass (NP) grades and offered institute wide, may be available in both semesters of year and must be passed before obtaining degree.
- (5) Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> and inform department by filling up registration form. After successful completion of the course and approval from the department UG committee, the course title can appear on the grade card of the student.
- (6) Department will offer the Value Added courses in a semester subject to availability of resources and enrollment of minimum 20 students opting for the course. Upon successful completion of the Value Added course, the grades of the courses will appear in the grade card of the student.
- (7) The contents of core courses are aligned with the latest GATE syllabus. The mapping between GATE syllabus topics and core courses is given in Table GATE-MAP. The term work for these courses shall include evaluations along the pattern of GATE examinations, for example, part of the term work shall consist of MCQ similar to GATE examinations.
- (8) The course contents, wherever appropriate, should include assessment based on Project Based Learning and a report of visit to an industry related to the course.
- (9) One of the Course Outcome (CO), wherever applicable, shall include attainment of one of the essential skillsets: leadership skills, entrepreneurship skills, managerial skills, communication skills, collaborative skills.
- (10) Students can optionally opt for Value Added Non-Technical courses offered by Center for Continuing Education (CCE-SPCE). These courses are with zero credit and upon successful completion, the course titles will appear on student's grade card. The list of courses is given in Table-VNT
- (11) L- Lecture, P- Laboratory, T-Tutorial.

**Sardar Patel College of Engineering Courses Offered for
Second Year B.Tech. in Mechanical Engineering
(Semester III)**

| Sr. No. | Course Name | Code | Course Plan per Week (Hrs) | | | Credits | In semester Evaluation (Points) | | End Semester Evaluation (Points) | | End semester weightage (%) | Term work/P ractical (Note 2) | Total Points |
|---|---|-----------|----------------------------|----------|----------|-----------|---------------------------------|------|----------------------------------|------------|----------------------------|----------------------------------|--------------|
| | | | L | P | T | | T-I | T-II | Points | Time (Hrs) | | | |
| Core Courses | | | | | | | | | | | | | |
| 1 | Applied Mathematics – III | BS-BTM301 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 2 | Strength of Materials | PC-BTM302 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 3 | Thermodynamics | PC-BTM305 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 4 | Manufacturing Science | PC-BTM306 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 5 | Organizational Communication and Interpersonal Skills | HS-BTM307 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| Laboratory Courses (Note 3) | | | | | | | | | | | | | |
| 6 | Strength of Materials Laboratory | PC-BTM352 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0% | 50 | 50 |
| 7 | Machine Shop Practice | PC-BTM399 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0% | 50 | 50 |
| Mandatory Courses (Note 4) | | | | | | | | | | | | | |
| 8 | Indian Traditional Knowledge | MC-BT002 | 3 | 0 | 0 | 0 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| Online Courses (Note 5) | | | | | | | | | | | | | |
| 9 | Online Course | OL-BTM38x | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Value Added Courses (Note 6) | | | | | | | | | | | | | |
| 10 | Introduction to Python Programming | VA-BTM391 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0% | 50 | 50 |
| Value Added Non-Technical Courses (Note 10) | | | | | | | | | | | | | |
| 11 | Refer Table-VNT | VN-BTxxx | Refer Table-VNT | | | | | | | | | | |
| | TOTAL | | 17 | 4 | 4 | 20 | | | | | | | |

Sardar Patel College of Engineering
Courses Offered for Second Year B.Tech. in Mechanical Engineering
(Semester IV)

| Sr. No. | Course Name | Code | Course Plan per Week (Hrs) | | | Credits | In semester Evaluation (Points) | | End Semester Evaluation (Points) | | End semester weightage (%) | Term work/P ractical | Total Points |
|---|--|-----------|----------------------------|----------|----------|-----------|---------------------------------|------|----------------------------------|------------|----------------------------|----------------------|--------------|
| | | | L | P | T | | T-I | T-II | Points | Time (Hrs) | | | |
| Core Courses | | | | | | | | | | | | | |
| 1 | Applied Mathematics -IV | BS-BTM401 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 2 | Fluid Mechanics | PC-BTM403 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 3 | Mech. Engineering Measurement | PC-BTM404 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 4 | Material Science | PC-BTM406 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 5 | Kinematics of Machinery | PC-BTM412 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 6 | Solid Mechanics | PC-BTM415 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| Laboratory Courses (Note 3) | | | | | | | | | | | | | |
| 7 | Fluid Mechanics Laboratory | PC-BTM453 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 8 | Mechanical Engineering Measurements Laboratory | PC-BTM454 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 9 | Material Science Laboratory | PC-BTM456 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 10 | Assembly Shop Practice | PC-BTM499 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| Online Courses (Note 5) | | | | | | | | | | | | | |
| 11 | Online Course | OL-BTM48x | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Value Added Courses (Note 6) | | | | | | | | | | | | | |
| 12 | COBOTS - Collaborative Robots | VA-BTM491 | 2 | 0 | 0 | 0 | 20 | 20 | 100 | 0 | 60% | 0 | 100 |
| Value Added Non-Technical Courses (Note 10) | | | | | | | | | | | | | |
| 13 | Refer Table-VNT | VN-BTxxx | Refer Table-VNT | | | | | | | | | | |
| | TOTAL | | 16 | 8 | 3 | 23 | | | | | | | |

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

**T.Y.B.Tech. in Mechanical Engineering
Course Credit System (R-18)**

NOTES:

1. Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
2. Laboratory course is considered as a separate head of passing.
3. Assessment criteria for laboratory/Tutorial work. i.e. weightage for assessment shall be as follows: i) Attendance in Laboratory/Tutorial = 20%, (ii) Journal= 40%, (iii) Practical Examination (and/or) Mini project (and/or) Quiz (and/or) Seminar (and/or) Oral (and/or) Industry visit report=40%.
4. Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> subject to approval from the department. After successful completion of the course, the course title can appear on the grade card of student.
5. The Mandatory courses are with Pass (P) and No Pass (NP) grades.
6. Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon completion of the Value Added course, the course title shall appear in the grade card of the student.
7. Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE). Upon successful completion of the course, the course title shall appear on student's grade card.
8. The contents of core courses are aligned with the latest GATE syllabus. The mapping between GATE syllabus topics and core courses is given in Table GATE-MAP.
9. For Open Elective courses, students with C.P.I. higher than 8.5 can opt for obtaining the credits by completing a online course (approved by department) offered through SWAYAM or NPTEL portal instead of completing elective courses offered by department/institute. Upon successful completion of course, the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation.

Sardar Patel College of Engineering
Courses Offered for Third Year B.Tech. in Mechanical Engineering
(Semester V)

| Sr. No. | Course Name | Code | Course Plan per Week (Hrs) | | | Credits | In semester Evaluation (Points) | | End Semester Evaluation (Points) | | End semester weightage (%) | Term work/P ractical (Note 2) | Total Points |
|-----------------------------------|---|-----------|----------------------------|---|---|-----------|---------------------------------|------|----------------------------------|------------|----------------------------|----------------------------------|--------------|
| | | | L | P | T | | T-I | T-II | Points | Time (Hrs) | | | |
| Core Courses | | | | | | | | | | | | | |
| 1 | Heat and Mass Transfer | PC-BTM501 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 2 | Mechatronics | PC-BTM503 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 3 | Dynamics of Machinery | PC-BTM512 | 2 | 0 | 0 | 2 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 4 | Thermal Systems | PC-BTM514 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 5 | Computer Aided Machine Drawing | PC-BTM515 | 1 | 0 | 0 | 1 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| Laboratory Courses | | | | | | | | | | | | | |
| 6 | Heat and Mass Transfer Lab. | PC-BTM551 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 7 | Mechatronics Lab. | PC-BTM553 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 8 | Dynamic of Machinery Lab. | PC-BTM562 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 9 | Thermal Systems Laboratory | PC-BTM564 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 10 | Computer Aided Machine Drawing Lab. | PC-BTM565 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| Professional Elective Course - I | | | | | | | | | | | | | |
| 11 | Professional Elective Course - I | PE-BTM5xx | Refer Table PEC-TYBTECH | | | 4 | Refer Table PEC-TYBTECH | | | | | | |
| Mandatory Courses | | | | | | | | | | | | | |
| 12 | Health Safety and Environment (HSE)* | MC-BTM003 | 2 | 0 | 1 | 0 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| Online Courses | | | | | | | | | | | | | |
| 13 | Online Course | OL-BTM58x | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Value Added Courses | | | | | | | | | | | | | |
| 14 | Reverse Engineering and Product Development | VA-BTM591 | 2 | - | - | 0 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| Value Added Non-Technical Courses | | | | | | | | | | | | | |
| 15 | Refer College Website | VN-BTxxx | Courses offered by CCE | | | | | | | | | | |
| | TOTAL | | | | | 21 | | | | | | | |

(*): The course MC-BTM003 may be offered by department for its completion in online mode. or SWAYAM/NPTEL portal by registering for an equivalent course approved by the department. In such case, student must obtain online course completion certificate for passing the course.

Sardar Patel College of Engineering
Courses Offered for Third Year B.Tech. in Mechanical Engineering
(Semester VI)

| 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 | | T-I | T-II | Points | Time (Hrs) | | | |
| Core Courses | | | | | | | | | | | | | |
| 1 | Manufacturing Planning and Control | PC-BTM605 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 2 | CAD/CAM/CIM | PC-BTM606 | 2 | 0 | 0 | 2 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 3 | Refrigeration and Air-conditioning | PC-BTM611 | 2 | 0 | 0 | 2 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 4 | Machine Design | PC-BTM612 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 5 | Internal Combustion Engine | PC-BTM614 | 2 | 0 | 0 | 2 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| Laboratory Courses | | | | | | | | | | | | | |
| 6 | CAD/CAM/CIM Laboratory | PC-BTM656 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 7 | Refrigeration and Air-conditioning Laboratory | PC-BTM661 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 8 | Internal Combustion Engine Laboratory | PC-BTM664 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| Professional Elective Course - II | | | | | | | | | | | | | |
| 9 | Professional Elective Course - II | PE-BTM5xx | Refer Table PEC-TYBTECH | | | 4 | Refer Table PEC-TYBTECH | | | | | | |
| Open Elective Course - I | | | | | | | | | | | | | |
| 10 | Open Elective Course - I | OE-BTx6xx | Refer Table OEC-TYBTECH | | | 3 | Refer Table OEC-TYBTECH | | | | | | |
| Online Courses | | | | | | | | | | | | | |
| 11 | Online Course | OL-BTM68x | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Value Added Courses | | | | | | | | | | | | | |
| 12 | CNC Programming | VA-BTM691 | 2 | 0 | 1 | 0 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| Value Added Non-Technical Courses | | | | | | | | | | | | | |
| 13 | Refer College Website | VNT-BTxxx | Courses offered by CCE | | | | | | | | | | |
| | TOTAL | | | | | 24 | | | | | | | |

Sardar Patel College of Engineering
TABLE PEC-TYBTECH: Professional Elective Courses - I and II
for Third Year B.Tech. in Mechanical Engineering (Semester V and VI)

| Sr. No. | Course Name | Specialization | 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 | | T-I | T-II | Points | Time (Hrs) | | | |
| Professional Elective Courses I and II | | | | | | | | | | | | | | |
| 1 | Finite Element Methods for Mech. Engineers | D | PE-BTM511 | 3 | 2 | 0 | 4 | 20 | 20 | 100 | 3 | 60% | 50 | 150 |
| 2 | Mechanical Vibrations | D | PE-BTM518 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 3 | Composite Material Technology | M | PE-BTM532 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 4 | Lean and Green Manufacturing | M | PE-BTM534 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 50 | 150 |
| 5 | Tool Engineering | M | PE-BTM537 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 6 | Industrial Mgmt. and Entrepreneurship | M | PE-BTM538 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 7 | Additive Manufacturing | M | PE-BTM539 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 8 | Hydraulic Machinery | T | PE-BTM552 | 3 | 2 | 0 | 4 | 20 | 20 | 100 | 3 | 60% | 50 | 150 |
| 9 | Compressible Fluid Flow | T | PE-BTM554 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |

Note: Specializations are: D - Design, M - Manufacturing, T - Thermal Engineering

Sardar Patel College of Engineering
TABLE OEC-TYBTECH: Open Elective Courses -I offered by Mechanical Engineering Department for
Third Year B.Tech. in Mechanical Engineering (Semester VI)

| Sr. No. | Course Name | Code | Course Plan per Week (Hrs) | | | Credits | In semester Evaluation (Points) | | End Semester Evaluation (Points) | | End semester weightage (%) | Term work/P ractical | Total Points |
|--|---|-----------|----------------------------|---|---|---------|---------------------------------|------|----------------------------------|------------|----------------------------|----------------------|--------------|
| | | | L | P | T | | T-I | T-II | Points | Time (Hrs) | | | |
| Open Elective Courses - I | | | | | | | | | | | | | |
| 1 | Computational Methods | OE-BTM611 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 2 | Entrepreneurship Development and Start-up | OE-BTM613 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 3 | Introduction to Optimization Methods | OE-BTM614 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 4 | Industry 4.0 | OE-BTM616 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 5 | Smart City for Sustainable Development | OE-BTM618 | 2 | 0 | 1 | 1 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 6 | Online Course from SWAYAM/NPTEL | OE-BTS6Mx | 0 | 0 | 0 | 3 | 0 | 0 | 100 | 0 | 100% | 0 | 100 |
| Additional OEC available: Refer open elective courses offered by Civil and Electrical Engineering Department of SPCE | | | | | | | | | | | | | |

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

Final Year B.Tech. in Mechanical Engineering Course Credit System (R-18)

NOTES:

1. Refer (i) Academic rules and regulations and (ii) Examination rules and regulations for further details
2. Laboratory course is considered as a separate head of passing.
3. Assessment criteria for laboratory/Tutorial work. i.e. weightage for assessment shall be as follows: i) Attendance in Laboratory/Tutorial = 20%, (ii) Journal= 40%, (iii) Practical Examination (and/or) Mini project (and/or) Quiz (and/or) Seminar (and/or) Oral (and/or) Industry visit report=40%.
4. Student can opt for an online course available on <https://swayam.gov.in/> or <https://onlinecourses.nptel.ac.in/> subject to approval from the department. After successful completion of the course, the course title can appear on the grade card of student.
5. The Mandatory courses are with Pass (P) and No Pass (NP) grades.
6. Department will offer the Value Added courses in a semester subject to availability of resources and enrolment of minimum 20 students opting for the course. Upon completion of the Value Added course, the course title shall appear in the grade card of the student.
7. Students can optionally opt for Non-Technical Value Added courses offered by Center for Continuing Education (CCE-SPCE). Upon successful completion of the course, the course title shall appear on student's grade card.
8. The contents of core courses are aligned with the latest GATE syllabus. The mapping between GATE syllabus topics and core courses is given in Table GATE-MAP.
9. For Open Elective courses, students with C.P.I. higher than 8.5 can opt for obtaining the credits by completing a online course (approved by department) offered through SWAYAM or NPTEL portal instead of completing elective courses offered by department/institute. Upon successful completion of course, the score given on certificate issued by SWAYAM/NPTEL will be converted to letter grade as per applicable examination regulation.
10. Semester VII: \$ For Project course: contact hours = 2 and self-learning hours = 6; @ For project course, in-semester evaluation shall include one or more in-semester presentations. (*) 15 points for report and 15 points for presentation and viva voce examined by supervisor and one internal examiner.
Semester VIII: \$ For Project course: contact hours = 2 and self-learning hours = 12; @ For project course, in-semester evaluation shall include one or more in-semester presentations. (*) 30 points for report and 30 points for presentation and viva voce examined by supervisor and one internal examiner.

Sardar Patel College of Engineering
Courses Offered for Final Year B.Tech. in Mechanical Engineering
(Semester VII)

| 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 | | T-I | T-II | Points | Time (Hrs) | | | |
| Core Courses | | | | | | | | | | | | | |
| 1 | Design of Machines and Mechanical Systems | PC-BTM711 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 2 | Industrial Engineering and Project Management | PC-BTM714 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| Professional Elective Course - III | | | | | | | | | | | | | |
| 3 | Professional Elective Course - III | PE-BTM7xx | Refer Table PEC-BTECH | | | 4 | Refer Table PEC-BTECH | | | | | | |
| Open Elective Course - II | | | | | | | | | | | | | |
| 4 | Open Elective Course - II | OE-BTM7xx | Refer Table OEC-BTECH | | | 3 | Refer Table OEC-BTECH | | | | | | |
| Project Course | | | | | | | | | | | | | |
| 5 | Project Stage I | PR-BTM798 | 0 | 2+6\$ | 0 | 4 | @ | @ | - | - | - | 50* | 50 |
| Online Courses | | | | | | | | | | | | | |
| 6 | Online Course | OL-BTM78x | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Value Added Courses | | | | | | | | | | | | | |
| 7 | Cloud Computing | VA-BTM791 | 2 | 0 | 1 | 0 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| Value Added Non-Technical Courses | | | | | | | | | | | | | |
| 8 | Refer College Website | VN-BTxxx | Courses offered by CCE | | | | | | | | | | |
| | TOTAL | | | | | 19 | | | | | | | |

Sardar Patel College of Engineering
Courses Offered for Final Year B.Tech. in Mechanical Engineering
(Semester VIII)

| Sr. No. | Course Name | Code | Course Plan per Week (Hrs) | | | Credits | In semester Evaluation (Points) | | End Semester Evaluation (Points) | | End semester weightage (%) | Term work/P ractical | Total Points |
|---|--|-----------|----------------------------|--------|---|-----------|---------------------------------|------|----------------------------------|------------|----------------------------|----------------------|--------------|
| | | | L | P | T | | T-I | T-II | Points | Time (Hrs) | | | |
| Professional Elective Course - IV, V | | | | | | | | | | | | | |
| 1 | Professional Elective Course - IV | PE-BTM7xx | Refer Table PEC-BTECH | | | 4 | Refer Table PEC-BTECH | | | | | | |
| 2 | Professional Elective Course - V | PE-BTM7xx | Refer Table PEC-BTECH | | | 4 | Refer Table PEC-BTECH | | | | | | |
| Open Elective Course - III / Internship | | | | | | | | | | | | | |
| 3 | Open Elective Course - III / Internship* | OE-BTM7xx | Refer Table OEC-BTECH | | | 3 | Refer Table OEC-BTECH | | | | | | |
| Project Course | | | | | | | | | | | | | |
| 4 | Project Stage II | PR-BTM898 | 0 | 2+12\$ | 0 | 7 | @ | @ | - | - | - | 100* | 100 |
| Online Courses | | | | | | | | | | | | | |
| 5 | Online Course | OL-BTM88x | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Value Added Courses | | | | | | | | | | | | | |
| 6 | Value Added Course | VA-BTM8xx | 2 | 0 | 1 | 0 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| Value Added Non-Technical Courses | | | | | | | | | | | | | |
| 7 | Refer College Website | VN-BTxxx | Courses offered by CCE | | | | | | | | | | |
| TOTAL | | | | | | 18 | | | | | | | |

* Optional, Refer Academic book for details.

Sardar Patel College of Engineering
TABLE PEC-BTECH: Professional Elective Courses - III, IV and V for Final Year B.Tech. in Mechanical Engineering
(Semester VII and VIII)

| Sr. No. | Course Name | Specialization | 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 | | T-I | T-II | Points | Time (Hrs) | | | |
| Professional Elective Courses III, IV and V | | | | | | | | | | | | | | |
| 1 | Process Eqpt. Design and Piping Engg. | D | PE-BTM711 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 2 | Fatigue, Fracture and Failure Analysis | D | PE-BTM718 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 3 | Industrial Robotics | M | PE-BTM733 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 4 | Supply Chain Management | M | PE-BTM734 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 5 | Welding Process and Welding Technology | M | PE-BTM735 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 6 | Computational Fluid Dynamics | T | PE-BTM752 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 7 | Introduction to Cryogenics | T | PE-BTM753 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 8 | Power Plant Engineering | T | PE-BTM754 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 9 | Automobile Engineering | T | PE-BTM755 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 10 | Renewable Energy Sources and Utilization | T | PE-BTM756 | 3 | 0 | 1 | 4 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |

Note: Specializations are: D - Design, M - Manufacturing, T - Thermal Engineering

Sardar Patel College of Engineering
TABLE OEC-BTECH: Open Elective Courses - II and III for Final Year B.Tech. in Mechanical Engineering
(Semester VII and VIII)

| Sr. No. | Course Name | Code | Course Plan per Week (Hrs) | | | Credits | In semester Evaluation (Points) | | End Semester Evaluation (Points) | | End semester weightage (%) | Term work/P ractical | Total Points |
|--|--|-----------|----------------------------|---|---|---------|---------------------------------|------|----------------------------------|------------|----------------------------|----------------------|--------------|
| | | | L | P | T | | T-I | T-II | Points | Time (Hrs) | | | |
| Open Elective Courses - II and III | | | | | | | | | | | | | |
| 1 | Introduction to Research Methodology | OE-BTM712 | 3 | 0 | 0 | 3 | 20 | 20 | 100 | 3 | 60% | 0 | 100 |
| 2 | Introduction to MEMS | OE-BTM714 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 3 | Solar and Wind Technology | OE-BTM715 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 4 | Digital Twin | OE-BTM617 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 5 | Fundamentals of AI and Machine Learning | OE-BTM718 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 6 | Value Engineering | OE-BTM719 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 7 | Generative Design | OE-BTM721 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 8 | Big Data Analytics | OE-BTM891 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 9 | Introduction to Augmented Reality | OE-BTM717 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 10 | Smart City for Sustainable Development | OE-BTM618 | 2 | 0 | 1 | 3 | 20 | 20 | 100 | 3 | 60% | 25 | 125 |
| 11 | Online Course from SWAYAM/NPTEL Refer TABLE SWAYAM / NPTL | OE-BTS7Mx | 0 | 0 | 0 | 3 | 0 | 0 | 100 | 0 | 100% | 0 | 100 |
| Additional OEC available: Refer open elective courses offered by Civil and Electrical Engineering Department of SPCE | | | | | | | | | | | | | |

Table GATE-MAP: Alignment of Course Content with GATE Syllabus
B.Tech. in Mechanical Engineering

| No. | Section | Core courses in SPCE Curriculum 2023-24 | Topics From GATE Syllabus |
|-----|---------|---|--|
| 1 | D | Machine Design | Machine Design |
| 2 | D | Design of Machines and Mech. Systems | Machine Design |
| 3 | D | Kinematics of Machinery | Theory of Machines |
| 4 | D | Dynamics of Machinery | Theory of Machines, Vibrations |
| 5 | D | Solid Mechanics | Mechanics of Materials |
| 6 | D | Strength of Materials | Mechanics of Materials |
| 7 | D | Computer Aided Machine Drawing | Machine Design |
| 8 | M | CAD/CAM/CIM | Computer Integrated Manufacturing |
| 9 | M | Mechanical Engineering Measurements | Metrology and Inspection |
| 10 | M | Manufacturing Science | Casting, Forming and Joining Processes; Machining and machine tool operations |
| 11 | M | Manufacturing Planning and Control | Production Planning and Control, Inventory Control, Operations Research |
| 12 | M | Mechatronics | Computer Integrated Manufacturing |
| 13 | M | Ind. Engg. And Proj./Fin. Mgmt. | Production Planning and Control, Operations Research |
| 14 | M | Material Science | Engineering materials |
| 15 | T | Thermal Systems | Applications of Fluid mechanics and Thermal sciences |
| 16 | T | Fluid Mechanics | Fluid Mechanics |
| 17 | T | Heat and Mass Transfer | Heat-Transfer |
| 18 | T | Refrigeration and Air-conditioning | Applications of Fluid mechanics and Thermal sciences |
| 19 | T | Thermodynamics | Thermodynamics |
| 20 | T | Internal Combustion Engine | Applications of Fluid mechanics and Thermal sciences |
| 21 | MATH | Applied Mathematics, I, II, III, IV | Linear Algebra, Calculus, Differential Equations, Complex variables, Probability and Statistics, Numerical Methods |

Note: Sections are: D - Applied Mechanics and Design, M -Materials, Manufacturing and Industrial Engineering, T - Fluid Mechanics and Thermal Sciences, MATH - Engineering Mathematics

Sardar Patel College of Engineering

TABLE SWAYAM / NPTL: Online Courses (12 Week) offered by SWAYAM or NPTL Portal for OE-II, III

| Sr. No. | Course Name | Course Id | Coordinating Institute | Proposed Faculty Coordinator |
|---------|--|-------------|------------------------|------------------------------|
| 1 | Heat Exchangers: Fundamentals And Design Analysis | noc22-de11 | IITG | RSM |
| 2 | Finite Element Method: Variational Methods to Computer Programming | noc22-me74 | IITK | NRR |
| 3 | Computational Continuum Mechanics | noc22-me83 | IITM | RBB |
| 4 | Metal Additive Manufacturing | noc22-me87 | IITG | RBB |
| 5 | Numerical Methods for Engineers | noc22-me89 | IITG | HSM |
| 6 | Solar Energy Engineering and Technology | noc22-me101 | IITK | KSB |
| 7 | Heat Exchangers: Fundamentals And Design Analysis | noc22-me102 | IITM | NRR/DNJ |
| 8 | Finite Element Method: Variational Methods to Computer Programming | noc22-me104 | IITG | SRV |
| 9 | Computational Continuum Mechanics | noc22-me106 | IITG | RSM |
| 10 | Metal Additive Manufacturing | noc22-me112 | IITK | KSB |
| 11 | Numerical Methods for Engineers | noc22-me116 | IITM | RSM |
| 12 | Solar Energy Engineering and Technology | noc22-me130 | IITG | BNB |
| 13 | Heat Exchangers: Fundamentals And Design Analysis | noc22-ge22 | IITG | RSM |
| 14 | Finite Element Method: Variational Methods to Computer Programming | noc22-ge28 | IITK | DNJ/NRR |
| 15 | Computational Continuum Mechanics | noc22-de11 | IITM | DNJ/NRR |
| 16 | Metal Additive Manufacturing | noc22-me74 | IITG | KSB |
| 17 | Numerical Methods for Engineers | noc22-me83 | IITG | RSM |
| 18 | Solar Energy Engineering and Technology | noc22-me87 | IITK | RSM |

NOTE: Students should explore for details of the course.

Course enrollment dates are generally in the month of July-August and December-January