

Regulation -23

(Under New Education Policy)

Academic Course Credit System and Evaluation Scheme
B.Tech. Mechanical Engineering (Working Professionals) Program
(Second Year)



DEPARTMENT OF MECHANICAL ENGINEERING
Sardar Patel College of Engineering, Mumbai

Scheme for Second Year B.Tech. in Mechanical Engineering (Working Professionals) with Minor in [**], (SEMESTER-III)
under Regulation-23 Academic Year 2026-27**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			SL/ Sem.	Credits	In semester Evaluation (Points)			End Semester Evaluation (Points)		End semester weightage (%)	Total Points
			L	P	T			Mid Term	Time (Hrs)	IE	Points	Time (Hrs)		
Core Courses														
1	Linear Algebra and Vector Calculus	ES-BTM301	2	0	1	48	3	30	1.5	20	100	3	50	100
2	Thermodynamics	PC-BTM302	3	0	1	64	4	30	1.5	20	100	3	50	100
3	Material and Manufacturing Science	PC-BTM303	3	0	0	48	3	30	1.5	20	100	3	50	100
4	Strength of Materials	PC-BTM304	3	0	0	48	3	30	1.5	20	100	3	50	100
5	Computer-Aided Mechanical Drawing	PC-BTM305	1	0	3	64	4	30	1.5	20	100	3	50	100
Laboratory Courses														
6	Material and Manufacturing Science Laboratory	PC-BTM353	0	2	0	2	1	0	0	25	25	0	100	50
7	Strength of Materials Laboratory	PC-BTM354	0	2	0	2	1	0	0	25	25	0	100	50
8	Machine Shop Practice	PC-BTM355	0	2	0	2	1	0	0	25	25	0	100	50
Value Education Course														
9	Health Safety and Sustainable Environment	VE-BTM001	2	0	0		2	30	1.5	20	50	3	100	100
TOTAL			14	6	5		22							

L: Lecture T: Tutorial P: Practical SL: Self Learning IE : Internal Evaluation

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

Scheme for Second Year B.Tech. in Mechanical Engineering (Working Professionals) with Minor in [**], (SEMESTER-IV)
under Regulation-23 Academic Year 2026-27**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			SL/ Sem.	Credits	In semester Evaluation (Points)			End Semester Evaluation (Points)		End semester weightage (%)	Total Points
			L	P	T			Mid Term	Time (Hrs)	IE	Points	Time (Hrs)		
Core Courses														
1	Statistics, Probability and Laplace Transform	ES-BTM401	2	0	1	48	3	30	1.5	20	100	3	50	100
2	Fluid Mechanics	PC-BTM402	3	0	0	48	3	30	1.5	20	100	3	50	100
3	Mechanical Measurement and Control	PC-BTM403	3	0	0	48	3	30	1.5	20	100	3	50	100
4	Kinematics of Machinery	PC-BTM404	3	0	1	64	4	30	1.5	20	100	3	50	100
5	Dynamics of Machinery	PC-BTM405	3	0	0	48	3	30	1.5	20	100	3	50	100
Laboratory Courses														
6	Fluid Mechanics Lab.	PC-BTM452	0	2	0	2	1	0	0	25	25	0	100	50
7	Mechanical Measurements and Control Lab.	PC-BTM453	0	2	0	2	1	0	0	25	25	0	100	50
8	Dynamics of Machinery Lab.	PC-BTM455	0	2	0	2	1	0	0	25	25	0	100	50
9	Assembly Shop Practice	PC-BTM456	0	2	0	2	1	0	0	25	25	0	100	50
Minor Course														
10	Minor-1	MI-BT021	2	0	0	32	2	30	1.5	20	100	3	50	100
TOTAL			16	8	2		22							

L: Lecture T: Tutorial P: Practical SL: Self Learning IE : Internal Evaluation

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

Evaluation for R23 : S.Y. B. Tech

1. The Evaluation of any course shall be such that all Course Outcomes are appropriately mapped.
2. Mid term: The courses under the category “Theory courses”, the evaluation is based on Mid Term of 30 points for 1.5 hours duration. Tentatively the first four modules of the course content will be covered in Mid Term. Any change in the same will be informed by the course instructor. The courses under the category “Skill Enhancement”, “Value Education”, the evaluation is based on activity (Presentation, Test, Mini project, Field project, Practical Examination) of 30 points each.
3. IE: Internal Evaluation will be carried out by the 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.
4. End semester evaluation: The course under the category “Theory 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. The courses under the category “Skill Enhancement”, “Value Education”, the evaluation is based on activity (Presentation, Test, Mini project, Field project, Practical Examination) of 50/100 points.
5. The evaluation of the laboratory courses include internal evaluation IE of 25 points and End semester evaluation of 25 points. The internal evaluation is based on [10 points: Laboratory Attendance, 15 points: Laboratory work] and End semester evaluation is based on [25 points: Quizzes/ Presentation/ Practical Examination/ Mini project/Oral may be any two activities]
6. The co-curricular course credits in semester VIII can be earned through participation in various activities during his/ her graduation. The co-curricular course credits are not considered for CPI calculation.
7. The evaluation of Field project/ Project/ Internship shall be as mentioned in Academic Rules.

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

Regulation -23

(Under New Education Policy)

Academic Course Credit System and Evaluation Scheme

B.Tech. Mechanical Engineering (Working Professionals) Program (Third Year)



DEPARTMENT OF MECHANICAL ENGINEERING
Sardar Patel College of Engineering, Mumbai

Scheme for Third Year B.Tech. in Mechanical Engineering (Working Professionals) with Minor in [**], (SEMESTER-V) under Regulation-23 Academic Year 2026-27**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			SL/ Sem	Credits	In semester Evaluation (Points)			End Semester Evaluation (Points)		End semester weightage (%)	Total Points
			L	P	T			Mid Term	Time (Hrs)	IE	Points	Time (Hrs)		
Core Courses														
1	Heat and Mass Transfer	PC-BTM501	3	0	0	48	3	30	1.5	20	100	3	50%	100
2	Design of Machine Elements	PC-BTM502	3	0	1	64	4	30	1.5	20	100	3	50%	100
3	CAD/CAM/CIM	PC-BTM503	2	0	0	32	2	30	1.5	20	100	3	50%	100
4	Mechatronics & Automation	PC-BTM504	2	0	0	32	2	30	1.5	20	100	3	50%	100
Laboratory Courses														
5	Heat and Mass Transfer Laboratory	PC-BTM551	0	2	0	2	1	0	0	25	25	0	100%	50
6	CAD/CAM/CIM Laboratory	PC-BTM553	0	2	0	2	1	0	0	25	25	0	100%	50
7	Mechatronics and Automation Laboratory	PC-BTM554	0	2	0	2	1	0	0	25	25	0	100%	50
Professional Elective Course														
8	Professional Elective - I	PE-BTM5XX	3	0	1		4	15	15	20	100	3	50%	100
Minor Course														
9	Minor-2	MI-BT022	3	0	1		4	15	15	20	100	3	50%	100
TOTAL			16	6	3		22							

L: Lecture T: Tutorial P: Practical SL: Self Learning IE : Internal Evaluation

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

Scheme for Third Year B.Tech. in Mechanical Engineering (Working Professionals) with Minor in [**], (SEMESTER-VI) under Regulation-23 Academic Year 2026-27**

Sr. No.	Course Name	Code	Course Plan per Week (Hrs)			SL/ sem	Cred its	In semester Evaluation (Points)			End Semester Evaluation (Points)		End semeste r weighta ge (%)	Total Points
			L	P	T			Mid Term	Time (Hrs)	IE	Poin ts	Time (Hrs)		
Core Courses														
1	Refrigeration and Air-conditioning	PC-BTM601	3	0	0	48	3	30	1.5	20	100	3	50	100
2	Thermal and Fluid Machines	PC-BTM602	3	0	0	48	3	30	1.5	20	100	3	50	100
3	Manufacturing Planning and Control	PC-BTM603	3	0	1	64	4	30	1.5	20	100	3	50	100
Laboratory Courses														
4	Refrigeration and Air-cond. Laboratory	PC-BTM651	0	2	0	32	1	0	0	25	25	0	100	50
5	Thermal and Fluid Machines Laboratory	PC-BTM652	0	2	0	32	1	0	0	25	25	0	100	50
Professional Elective courses														
6	Professional Elective -II	PE-BTM6xx	3	0	1	64	4	15	15	20	100	3	50	100
Community Engagement Project/ Field Project														
7	Field Project Stage I	FP-BTM601	2*+32				2	-	-	50	50	-	100	100
Minor Course														
8	Minor-3	MI-BT023	3	0	1	64	4	15	15	20	100	3	50	100
TOTAL			15	8	3		22							

L: Lecture T: Tutorial P: Practical SL: Self Learning IE : Internal Evaluation

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

Evaluation for R23 : T.Y. B. Tech

1. The Evaluation of any course shall be such that all Course Outcomes are appropriately mapped.
2. Mid term: The courses under the category “Theory courses”, the evaluation is based on Mid Term of 30 points for 1.5 hours duration. Tentatively the first four modules of the course content will be covered in Mid Term. Any change in the same will be informed by the course instructor. The courses under the category “Skill Enhancement”, “Value Education”, the evaluation is based on activity (Presentation, Test, Mini project, Field project, Practical Examination) of 30 points each.
3. IE: Internal Evaluation will be carried out by the 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.
4. End semester evaluation: The course under the category “Theory 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. The courses under the category “Skill Enhancement”, “Value Education”, the evaluation is based on activity (Presentation, Test, Mini project, Field project, Practical Examination) of 50/100 points.
5. The evaluation of the laboratory courses include internal evaluation IE of 25 points and End semester evaluation of 25 points. The internal evaluation is based on [10 points: Laboratory Attendance, 15 points: Laboratory work] and End semester evaluation is based on [25 points: Quizzes/ Presentation/ Practical Examination/ Mini project/Oral may be any two activities]
6. The co-curricular course credits in semester VIII can be earned through participation in various activities during his/ her graduation. The co-curricular course credits are not considered for CPI calculation.
7. The evaluation of Field project/ Project/ Internship shall be as mentioned in Academic Rules.

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

Regulation -23

(Under New Education Policy)

Academic Course Credit System and Evaluation Scheme
B.Tech. Mechanical Engineering Program
(Final Year)



DEPARTMENT OF MECHANICAL ENGINEERING
Sardar Patel College of Engineering, Mumbai

	Scheme for Final Year B.Tech. in Mechanical Engineering (Working Professionals) with Minor in [****], (<u>SEMESTER-VII</u>) under Regulation-23 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 (%)	Total Points
			L	P	T	SL/sem		Mid Term	Time (Hrs)	IE	Points	Time (Hrs)		
Core Courses														
1	Design of Machines and Mechanical Systems	PC-BTM701	3	0	1	64	4	30	1.5	20	100	3	50	100
2	Industrial Engineering, Project and Finance Management	PC-BTM702	3	0	1	64	4	30	1.5	20	100	3	50	100
Professional Elective Course														
3	Professional Elective -III	PE-BTM7xx	2	0	1	48	3	30	1.5	20	100	3	50	100
Open Elective Course														
4	Open Elective - I	OE-BTM7xx	2	0	1	48	3	30	1.5	20	100	3	50	100
Institute Course														
5	Research Methodology and Ethics	IC-BT01	2	0	0	32	2	30	1.5	20	100	3	50	100
B. Tech Project														
6	Project	PR-BTM701	2+6*				4			50	50		100	100
Minor Course														
7	Minor-4	MI-BT024	3	2	1	64	4	30	1.5	20	100	3	50	100
TOTAL			15	2	5		24							

L: Lecture T: Tutorial P: Practical SL: Self Learning IE : Internal Evaluation

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Apart from actual contact hours (L T P), the remaining hours are used for term work and self-learning by students

Scheme for Final Year B.Tech. in Mechanical Engineering (Working Professionals) with Minor in [**], (SEMESTER-VIII) under Regulation-23 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 (%)	Total Points
			L	P	T	SL		Mid Term	Time (Hrs)	IE	Points	Time (Hrs)		
Professional Elective Course (PE)														
1.	Professional Elective -IV*	PE-BTM8xx	3	0	1	64	4	30	1.5	20	100	3	50	100
Open Elective Course (OE)														
2.	Open Elective -II*	OE-BTM8xx	2	0	1	48	3	30	1.5	20	100	3	50	100
Ability Enhancement Course (AEC)														
3.	Modern Indian Language	AE-BT801 to 803	1	0	0	16	1	-	-	50	50	-	100	100
Cocurricular Activities (CC)														
4.	Co-Curricular	CC-BTM8XX	Refer note					2	\$\$\$\$					100
Project														
5.	Work Based Project	PR-BTM801	8+12*				10	100		-	100	-	100	200
	TOTAL		7	8			20							

*PE-IV and OE-II may be floated by department or SWAYAM/NPTEL course of 12 weeks minimum.

L: Lecture T: Tutorial P: Practical SL: Self Learning IE: Internal Evaluation

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

Evaluation for R23 : Final year B.Tech

1. The Evaluation of any course shall be such that all Course Outcomes are properly mapped.
2. Mid term: The courses under the category “Theory courses”, the evaluation is based on Mid Term of 30 points for 1.5 hours duration. Tentatively the first four modules of the course content will be covered in Mid Term. Any change in the same will be informed by the course instructor. The courses under the category “Skill Enhancement”, “Value Education”, the evaluation is based on activity (Presentation, Test, Mini project, Field project, Practical Examination) of 30 points each.
3. IE: Internal Evaluation will be carried out by the 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.
4. End semester evaluation: The course under the category “Theory 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. The courses under the category “Skill Enhancement”, “Value Education”, the evaluation is based on activity (Presentation, Test, Mini project, Field project, Practical Examination) of 50/100 points.
5. The evaluation of the laboratory courses include internal evaluation IE of 25 points and End semester evaluation of 25 points. The internal evaluation is based on [10 points: Laboratory Attendance, 15 points: Laboratory work] and End semester evaluation is based on [25 points: Quizes/ Presentation/ Practical Examination/ Mini project/Oral may be any two activities]
6. The co-curricular course credits in semester VIII can be earned through participation in various activities during his/ her graduation. The co-curricular course credits are not considered for CPI calculation.
7. The evaluation of Field project/ Project/ Internship shall be as mentioned in Academic Rules.

List of Professional Electives

Professional Elective-I	Professional Elective-II	Professional Elective-III	Professional Elective-IV
Sem V	Sem VI	Sem VII	Sem VIII
Finite Element Methods PE-BTM511	Computational Fluid Dynamics PE-BTM611	Industrial Robotics PE-BTM711	SWAYAM / NPTEL portal as recommended by the department course committee
Lean and Green Manufacturing PE-BTM512	Introduction to Composite Materials Technology PE-BTM612	Renewable Energy Applications PE-BTM712	Engineering Simulation Techniques PE-BTM811
Introduction to Cryogenics PE-BTM513	Tool Engineering PE-BTM613	Welding Process and Technology PE-BTM713	Intelligent CAD/CAM systems PE-BTM812
Compressible Fluid Flow PE-BTM514	Mechanical Vibration PE-BTM614	Power Plant Engineering PE-BTM714	Non-traditional Machining Processes PE-BTM813
Nature Inspired Design and Innovation PE-BTM515	Industrial Management and Entrepreneurship PE-BTM615	Automobile Engineering PE-BTM715	

List of Open Electives (To be decided at institute level)

Open Elective -I	Open Elective -II
Sem VII	Sem VIII
Financial Planning and Wealth Management OE-BTM701	AI-Enabled Research Methodology OE-BTM801
	Value Engineering OE-BTM802
	Solar and Wind Technology OE-BTM803
	Generative Design OE-BTM804
	Introduction to Augmented Reality OE-BTM805
	Introduction to Micro Electro Mechanical Systems OE-BTM806

List of Ability Enhancement Course (Modern Indian Language)

Sr. No.	Course Code	Course Title
1	AE_BT801	Hindi
2	AE-BT802	Sanskrit
3	AE-BT803	Marathi

Table GATE-MAP

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

Minor courses in Department of Mechanical Engineering – ‘Industry 4.0 Technologies’**The list of courses:**

1. Internet of Things (Course code: MI-BT021) (*Minor 1*)
2. Additive Manufacturing (Course code: MI-BT022) (*Minor 2*)
3. Artificial Intelligence and Machine Learning (Course code: MI-BT023) (*Minor 3*)
4. Digital Twin (Course code: MI-BT024) (*Minor 4*)

Exit Courses under B.Tech. in Mechanical Engineering Program (Regulation-23)		
Sr. No.	Course Name	Credits
Second Year of Engineering		
1	Advanced Excel, or	3
	Advanced Python Programming	
	CATIA (Assembly and Manufacturing Simulations)	
	Mechanical Analysis Software tool (ANSYS, ABAQUS etc.)	
	LabVIEW software	
	CNC Programming	
2	Instrument Calibration and Characterization	3
	3D printing operation	
	Simulink for System Modeling	
	CNC Machine Operation and Maintenance,	
	Advanced Welding Techniques	
	Solar System Installation and Grid Integration	
3	Two-week internship in a manufacturing industry	2

Note: The student needs to select one course from each group (1) and (2) as an exit course.

Third Year of Engineering		
1	Advanced Excel, or	3
	Advanced Python Programming	
	MATLAB and its application in engineering	
	CNC Programming	
	Mechanical Analysis Software tool (ANSYS, ABAQUS etc.)	
2	AC and Refrigeration Repair and Maintenance	3
	Piping Design using a Software	
	3D Printing and Design	
	Computational Fluid Dynamics Software	
	Electrical vehicle design and maintenance	
3	Two-week internship in a manufacturing industry	2

Note: The student needs to select one course from each group (1) and (2) as an exit course.