1. Abbreviations

Course Categories as per AICTE
BS: Basic Science
EC: Engineering Science
PC: Programme Core Course
PE: Programme Elective
OE: Open Elective
HS: Humanities Social Science and Management
CC: Co-curricular Courses
PR: Project Work
IN: Internship

Course Sub-categories as per Maharashtra state NEP
MDM: Multidisciplinary Minor
VSEC: Vocational and Skill Enhancement Course
AEC: Ability Enhancement Course
IKS: Indian Knowledge System
VEC: Value Education Course
CEP: Comm. Engg. Project
FP: Field Project

2. Course Code

ME	**1**	**2**	**0**	**1**	**T**
Offering Academic Unit (Dept/Centre of Excellence)	Year	Revision number	Course Number		Course Component

S. Y. B. Tech (Mechanical Engineering)

Curriculum Pattern: 2025

Semester III - (Level 5 - UG-Diploma/ Diploma-Eng)

S.N.	Course Category (Course Subcategory)	Course Code	Course title	Teaching Scheme, Classroom Contact hr/week (contact hr/semester)			Self-learning (contact hr/semester)	Total Classroom Contact hr/week (contact hr/ semester)	Credit (Total contact of semester /30)	Examination scheme (Marks)				
										Continuous Assessment			Semester End Examination	Total Marks
				L	T	P	SL	Hr	C	TA1	MSE	TA2	ESE	
1	ES	ES2301T	Differential Equations and Vector Calculus	3 (45)	1 (15)	0 (0)	- (60)	4 (120)	4	10	30	10	50	100
2	ES	ME2301L	Introduction to Python for Programming and Data Science	0 (0)	0 (0)	4 (40)	- (20)	4 (60)	2	20	20	20	40	100
3	HS (VSEC)	HS2301T	Universal Human Values and Professional Ethics	2 (30)	1 (15)	0 (0)	- (45)	3 (90)	3	25*	20*	25	30	100
4	PC	ME2302T	Introduction to Materials Science & Engineering	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
5	PC	ME2302L	Materials Science & Engineering Lab	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
6	PC	ME2303T	Solid Mechanics	3 (45)	1 (15)	0 (0)	- (60)	4 (120)	4	10	30	10	50	100
7	PC	ME2304T	Engineering Thermodynamics	3 (45)	1 (15)	0 (0)	- (60)	4 (120)	4	10	30	10	50	100
Total								**24 (630)**	**21**	**360**			**290**	**650**

Note: all marked are scaled down marks

TA1: Teacher's Assessment 1, TA2: Teacher's Assessment 2, MSE: Mid Semester Examination, ESE: End Semester Examination

*No pan and panicle

S. Y. B. Tech (Mechanical Engineering)

Curriculum Pattern: 2025

Semester IV - (Level 5 - UG-Diploma/ Diploma-Eng)

S.N.	Course Category (Course Subcategory)	Course Code	Course title	Teaching Scheme, Classroom Contact hr/week (contact hr/semester)			Self-learning (contact hr/semester)	Total Classroom Contact hr/week (contact hr/ semester)	Credit (Total contact of semester /30)	Examination scheme (Marks)				
										Continuous Assessment			Semester End Examination	Total Marks
				L	T	P	SL	Hr	C	TA1	MSE	TA2	ESE	
1	ES	ES2303L	Computational Mathematics Laboratory	0 (0)	0 (0)	4 (40)	- (20)	4 (60)	2	20	20	20	40	100
2	CC	CCA2301L	Extra-Curricular	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
3	PR (MDM)	ME2305L	Design Thinking and Innovation Lab	0 (0)	0 (0)	4 (40)	- (20)	4 (60)	2	20	20	20	40	100
4	PC	ME2306T	Manufacturing Technology-I	3 (45)	1 (15)	0 (0)	- (60)	4 (120)	4	10	30	10	50	100
5	PC	ME2307T	Theory of Machines	3 (45)	1 (15)	0 (0)	- (60)	4 (120)	4	10	30	10	50	100
6	PC	ME2308T	Fluid Mechanics	3 (45)	1 (15)	0 (0)	- (60)	4 (120)	4	10	30	10	50	100
7	PC	ME2309T	Principles of Automation and Robotics	3 (45)	0 (0)	0 (0)	- (45)	3 (90)	3	10	30	10	50	100
8	PC	ME2309L	Automation and Robotics Lab	0 (0)	0 (0)	2 (20)	- (10)	2 (30)	1	10	10	10	20	50
9	PC	ME2310L	Machine Drawing Laboratory	0 (0)	0 (0)	4 (40)	- (20)	4 (60)	2	20	20	20	40	100
Total								**31 (690)**		**440**			**360**	**800**

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RAJARSHI SHAHU COLLEGE OF ENGINEERING
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DEPARTMENT OF MECHANICAL ENGINEERING

Department of Mechanical Engineering
T. Y. B. Tech Structure
(2023 Pattern)

Dr. S. N. Khan	Dr. K. P. Moholkar	Dr. A. M. Badadhe
BOS Chairman (Mechanical)	Dean Academics	Director RSCOE, Pune

JSPM's
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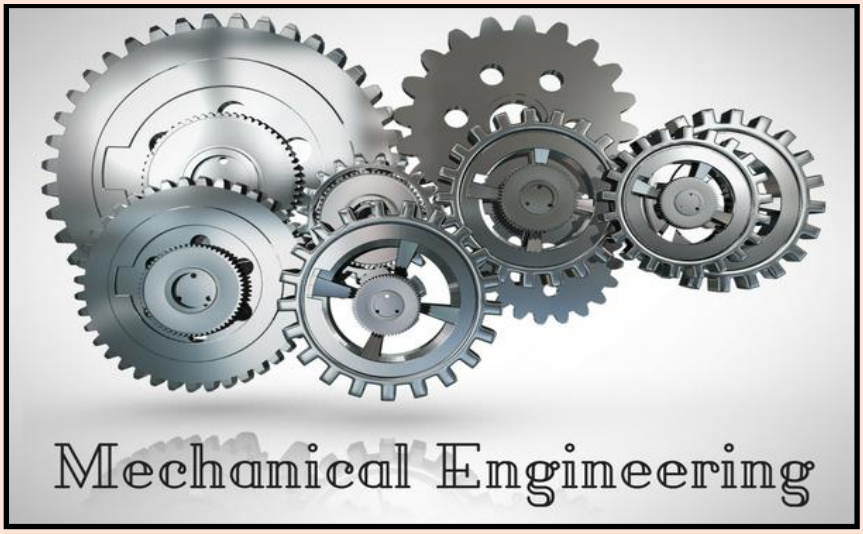
DEPARTMENT OF MECHANICAL ENGINEERING

Vision

To be regionally, nationally and internationally recognized **center of excellence** in all fields of Mechanical Engineering education where the best of teaching- learning, state-of-art **research** and **consultancy** synergize

Mission

- To inculcate basic Mechanical Engineering knowledge to students through effective **teaching–learning practices**.
- To encourage students for **higher studies**, **research** and **entrepreneurship**.
- To cater the needs of **society** in context of Mechanical Engineering



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DEPARTMENT OF MECHANICAL ENGINEERING

Program Outcomes (POs)

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

At the end of this program, students will develop-

PSO1: Professional Skills-An ability to design solution for thermal, hydraulic systems, design components and production processes that meet the specified needs with team work and management skills for safety, societal and environmental aspects through lifelong learning.

PSO2: Problem-Solving Skills-An ability to use Modelling and Analysis tools and technologies necessary for obtaining effective, economical and accurate solutions of engineering problems.

PSO3: Professional Career and Entrepreneurship -An ability to design electromechanical and automation systems in multidisciplinary environments through better communication.

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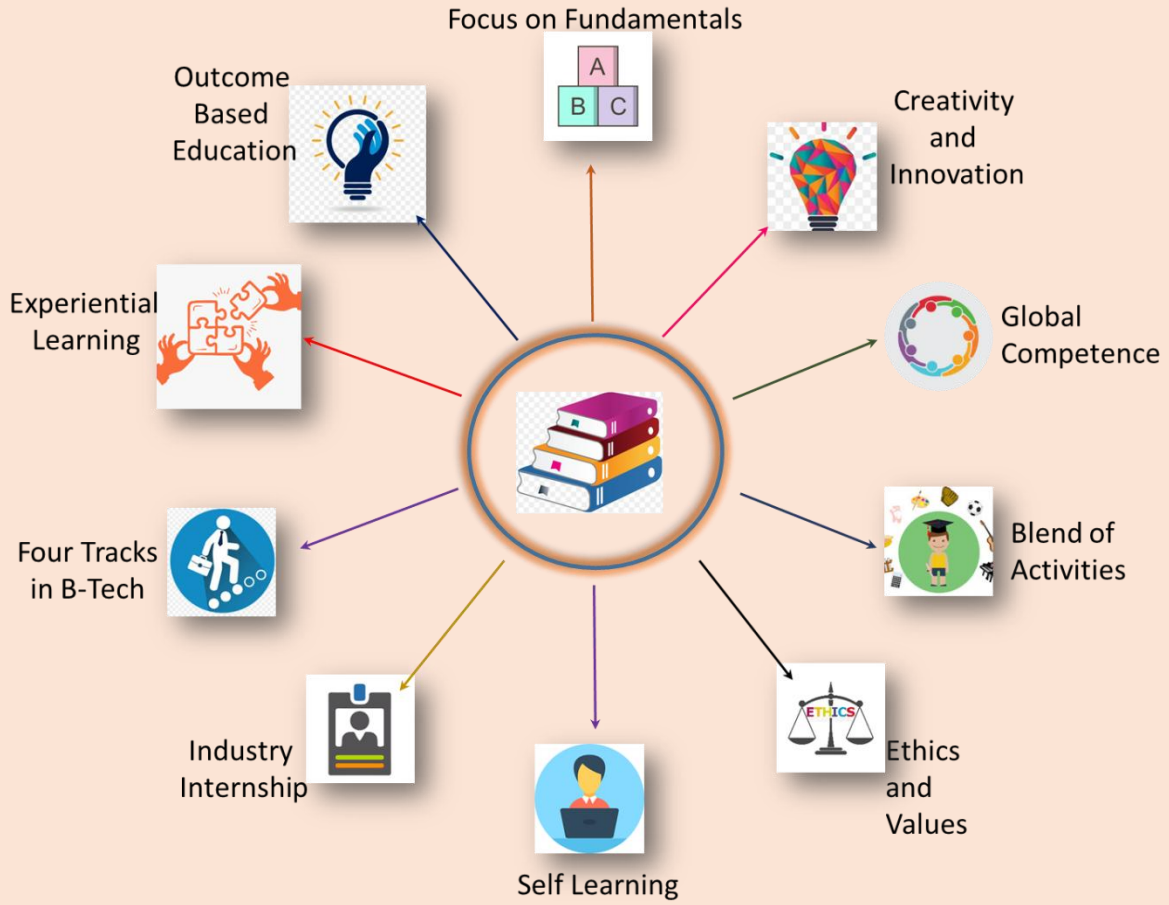
DEPARTMENT OF MECHANICAL ENGINEERING

Highlights of the Syllabus

The Curriculum of UG Program of **Mechanical Engineering** has been designed in association with **Indian Institute of Technology, Ropar** and **Experts from Academics, industries / Corporate & Distinguish Alumni.** Major features of the curriculum are presented in the following diagram.



Dr. S. N. Khan
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Unique Features of the Curriculum

1. **Curriculum centered at Outcome Based Education:**
   The new Curriculum is based on student-centered instruction models that focus on measuring student performance through outcomes. The outcomes include subject knowledge, industry required skills and attitudes.
2. **Emphasize on Fundamentals:**
   The nature of the new curriculum is rigorous and well prescribed so that the students can spend more time on preparation and self-study. The students have to learn core subjects, solve practical based assignments and must attempt periodical quizzes. This will benefit them to grasp and keep a strong hold on fundamentals of Engineering in the most effective way.
3. **Experiential Learning:**
   The curriculum emphasizes on hands-on sessions along with theoretical information. The new curriculum considers Problem Based Learning (PBL) as a teaching pedagogy and includes different subjects that encourage the students for hands on learning through virtual labs, mini-projects, etc. Accordingly, the curriculum maintains good balance between theory and laboratory credits.
4. **Promote Creativity and Innovation:**
   Along with experiential learning, the curriculum also motivates the students to inculcate creativity and innovation. Apart from conventional lab, the curriculum provides a freedom for students to perform industry assignments, pilot projects, innovative development, etc.
5. **Inculcating Ethics and Values:**
   To improvise student's behaviour, the curriculum has included systematic courses on ethics and values. The moral principles can help students to make right decisions, lead their professional lives and become ethical citizen.
6. **Blend of Curricular and Extracurricular Activities**
   The curriculum also gives importance of different activities like co-curricular, extra-curricular, sports, culture, etc. This will help to do all round development of students in all possible ways.
7. **Track Tracks in B-Tech:**
   By offering various courses/electives, flexibility in choosing work in specified field as:
   I. Internship II. Capstone Project

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Course Type Abbreviations

BSC: Basic Science Course

ESC: Engineering Science Course

PCC: Programme Core Course

PEC: Programme Elective Course

MDM: Multidisciplinary Minor

OE: Open Elective

VSEC: Vocational and Skill Enhancement Course

HSSM: Humanities Social Science and Management

AEC: Ability Enhancement Course

IKS: Indian Knowledge System

VEC: Value Education Course

CEP: Comm. Engg. Project

FP: Field Project

CC: Co-curricular Courses

Dr. S. N. Khan BOS Chairman (Mechanical)	Dr. K. P. Moholkar Dean Academics	Dr. A. M. Badadhe Director RSCOE, Pune

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T. Y. B. Tech (Mechanical Engineering)
Academic Year -2025-2026 (Semester –V)
(Level 5.5 - B. Voc./ B.Sc. Engg.) -Semester V

Sr. No.	Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks	Ownership
				L	T	P	Hr	C	ISE	MSE	ESE		
1	PCC	ME3201T	Manufacturing Technology-II	3	1	0	4	4	20	30	50	100	Mechanical
2	PCC	ME3202T	Heat & Mass Transfer	3	1	0	4	4	20	30	50	100	Mechanical
3	PCC	ME3203T	Theory of Vibrations	2	0	0	2	2	20	30	50	100	Mechanical
4	PCC	ME3204L	Design Lab-I	0	0	4	4	2	ISCE: 60		40	100	Mechanical
5	PCC	ME3205L	Thermo-fluids Lab-I	0	0	2	2	1	ISCE: 30		20	50	Mechanical
6	PCC	ME3206L	Manufacturing Lab-I	0	0	2	2	1	ISCE: 30		20	50	Mechanical
7	OE		Open Elective-I/MOOC Courses	3	0	0	3	3			50	100	Mechanical
8	MDM		Multidisciplinary Minor-II	3	0	0	3	3	20	30	50	100	Mechanical
9	MDM		Multidisciplinary Minor Lab-II	0	0	2	2	1	ISCE: 30		20	50	Mechanical
10	CC	ME3209L	Co-Curricular Activities	0	0	2	2	1	ISCE: 50			50	Mechanical
			Total	**14**	**02**	**12**	**28**	**22**				**800**	

Abbreviations:
L – Lecture, T – Tutorial, P – Practical, Hr – Hours, C – Credits, ISE – In Semester Evaluation, MSE – Mid Semester Evaluation, ESE – End Semester Evaluation

Open Electives- I/ MOOC Courses

Course Code	Course
ME3207L	OE-I - Integrated Design Engineering
	SWAYAM Course1- Solar Energy Engineering and Technology
	SWAYAM Course2- Sustainable Energy Technology

Notes:

1. **For Theory courses: There shall be MSE, ISE and ESE. The ESE is a separate head of passing.**
2. **For Lab courses: There shall be continuous assessment (ISCE consists of ISE and MSE). The ESE is a separate head of passing. MSE result shall be communicated to students in a due time.**

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T. Y. B. Tech (Mechanical Engineering)
Academic Year -2025-2026 (Semester –VI)
(Level 5.5 - B. Voc./ B.Sc. Engg.) -Semester VI

Sr. No.	Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks	Ownership
				L	T	P	Hr	C	ISE	MSE	ESE		
1	**ESC**	**ES3201T**	Environmental Science & Engineering	3	0	0	3	3	20	30	50	**100**	Humanities
2	**PCC**	**ME3210T**	Design of Machine Elements	3	1	0	4	4	20	30	50	**100**	Mechanical
3	**PCC**	**ME3211L**	Manufacturing Lab-II	0	0	2	2	1	ISCE: 30		20	**50**	Mechanical
4	**PCC**	**ME3212L**	Thermo-fluids Lab-II	0	0	2	2	1	ISCE: 30		20	**50**	Mechanical
5	**Project**	**PJ3101L**	Engineering Innovation and Society -I (Project I)	0	0	4	4	2	ISCE: 50		50	**100**	Mechanical
6	**PCC**	**ME3213L**	Design Lab II	0	0	2	2	1	ISCE: 30		20	50	Mechanical
7	**PCC**	**ME3214L**	Thermo-fluids Lab III	0	0	2	2	1	ISCE: 30		20	50	Mechanical
8	**OE**		Open Elective-II/ MOOC Courses	3	0	0	3	3	20	30	50	**100**	Mechanical
9	**PCC**	**ME3215T**	Internal Combustion Engine	3	0	0	3	3	20	30	50	**100**	Mechanical
10	**MDM**		Multidisciplinary Minor-III	3	0	0	3	3	20	30	50	**100**	Mechanical
			Total	**15**	**01**	**12**	**28**	**22**				**800**	

Abbreviations:
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Open Electives- II/ MOOC Courses

Course Code	Course
ME3216T	OE-II - Product Design and Development
	SWAYAM Course1-
	SWAYAM Course2-

Notes:
1. **For Theory courses: There shall be MSE, ISE and ESE. The ESE is a separate head of passing.**
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Multidisciplinary Minor

Course Code	Course	Semester	Course
MEM2201T	Multidisciplinary Minor-I	**IV**	Material Science & Engineering
MEM3201T	Multidisciplinary Minor-II	**V**	Manufacturing Technology
MEM3201L			Manufacturing Technology Lab
MEM3202T	Multidisciplinary Minor-III	**VI**	CAD/CAM
MEM4201T	Multidisciplinary Minor-IV	**VII**	Automobile Engineering
MEM4201L			Automobile Engineering Lab

List of Exit Courses after completion of Semester V and VI

1. Exit option is available for students those who have earned the total 132 credits at the End of sixth Semester.
2. Student who wants to avail the exit option after third year has to earn additional 8 credits from the list of courses shown below.
3. These courses student has to complete within summer vacation after 3rd Year.
4. After fulfilment as mentioned in 1 to 3 above, Students can earn **B.Voc./ B.Sc. Engg** and same will be issued by the Institute.

Sr. No.	Course code	Name	Credits
1.	**EX-ME3201**	Application of MATLAB for Mechanical Engineering	**2**
2.	**EX-ME3202**	Certified Design Software	**2**
3.	**EX-ME3203**	Application of ANSYS for Mechanical Engineering	**2**
4.	**EX-ME3204**	Certified 3D Printing	**2**
5.	**EX-ME3205**	Minor Project	**2**
6.	**EX-ME3206**	Internship Mechanical Industry (4 Week)	**2**

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DEPARTMENT OF MECHANICAL ENGINEERING

Department of Mechanical Engineering
Final Year B. Tech Structure
(2023 Pattern)

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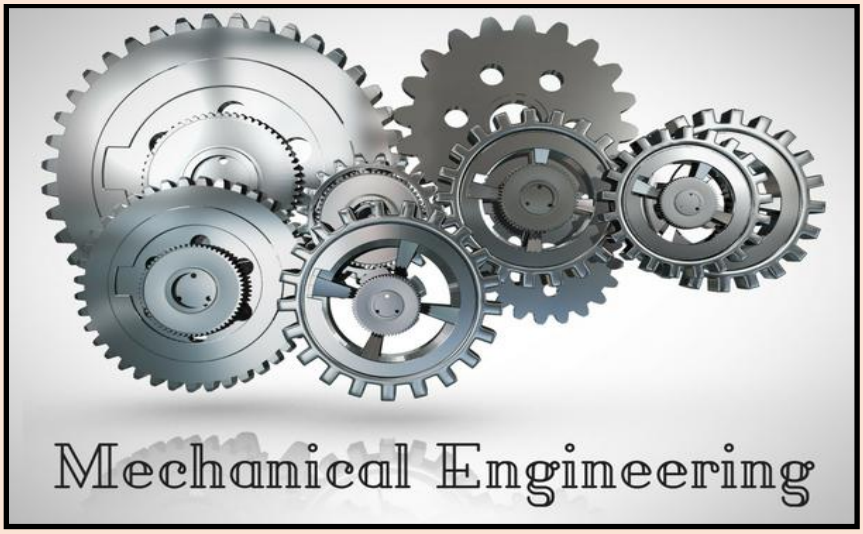

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DEPARTMENT OF MECHANICAL ENGINEERING

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DEPARTMENT OF MECHANICAL ENGINEERING

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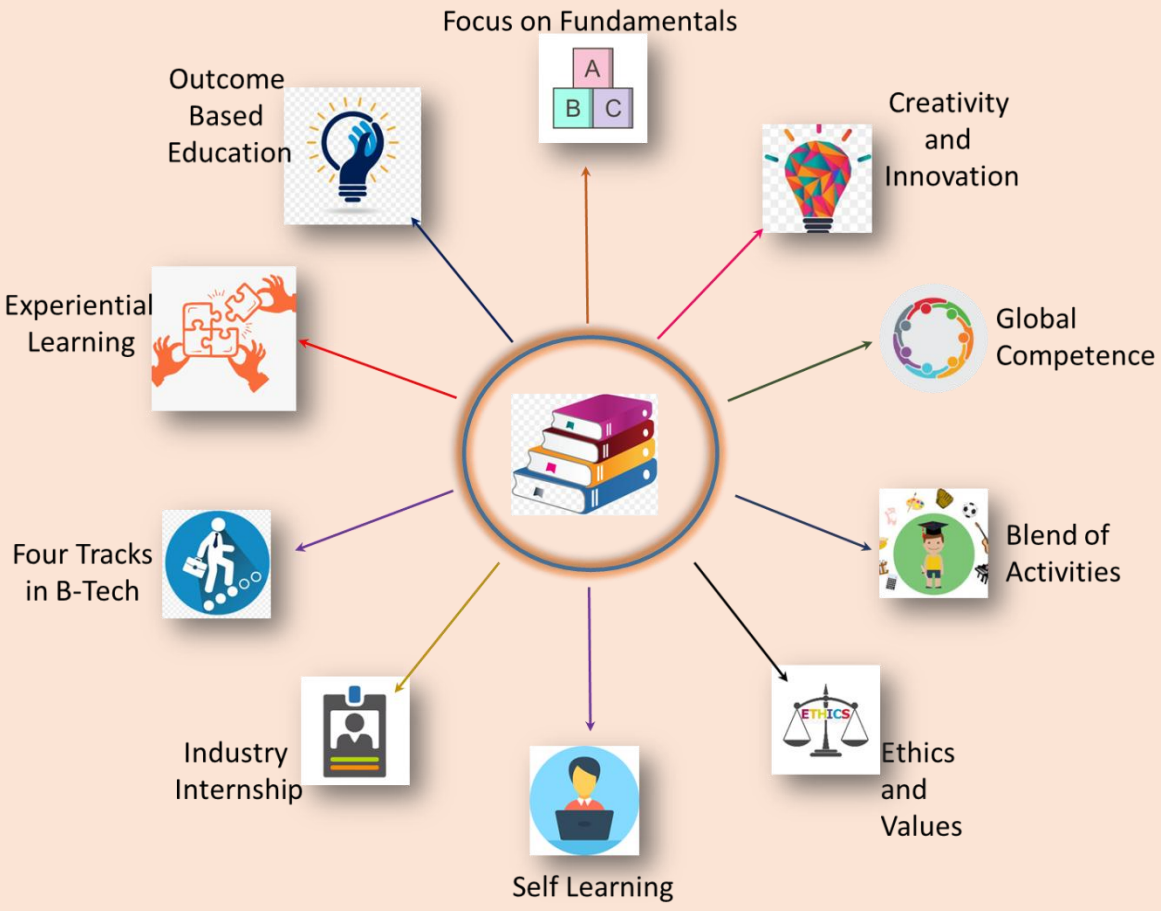
IIT Ropar
Indian Institute of Technology, Ropar

Industry/Corporate Experts

Academic Experts



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TATHAWADE, PUNE-33
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Final Year B. Tech (Mechanical Engineering)
Academic Year -2026-2027 (Semester –VII)
(Level 6 –B. Tech.) -Semester VII

Sr. No.	Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks	Ownership
				L	T	P	Hr	C	ISE	MSE	ESE		
1	**PCC**	**ME4201T**	Mechanical System Design	3	1	0	4	4	20	30	50	**100**	Mechanical
2	**PEC**	**ME4202T**	Professional Electives- I/MOOC Courses	3	0	0	3	3	20	30	50	**100**	Mechanical
3	**PEC**	**ME4203T**	Professional Electives- II/MOOC Courses	3	1	0	4	4	20	30	50	**100**	Mechanical
4	**PCC**	**ME4204T**	Mechatronics & Automation	2	0	0	2	2	20	30	50	**100**	Mechanical
	PCC	**ME4204L**	Mechatronics & Automation Lab	0	0	2	2	1	ISCE: 30		20	**50**	Mechanical
5	**Project**	**ME4205L**	Engineering Innovation and Society -II	0	0	12	12	6	ISCE: 150		150	**300**	Mechanical
6	**MDM**		Multidisciplinary Minor-IV	3	0	0	3	3	20	30	50	**100**	Mechanical
7	**MDM**		Multidisciplinary Minor Lab-IV	0	0	2	2	1	ISCE: 30		20	**50**	Mechanical
			Total	**14**	**02**	**16**	**32**	**24**				**850**	

Abbreviations:
L – Lecture, T – Tutorial, P – Practical, Hr – Hours, C – Credits, ISE – In Semester Evaluation, MSE – Mid Semester Evaluation, ESE – End Semester Evaluation

Professional Electives- I

Course Code	Course
ME4201T-A	Introduction to Mechanical Micro Manufacturing
ME4201T-B	Fluid Machinery
ME4201T-C	Optimisation Techniques
ME4201T-D	Additive Manufacturing

Professional Electives- II

Course Code	Course
ME4202T-A	Finite Element Analysis
ME4202T-B	Power Plant Engineering
ME4202T-C	Composite Manufacturing
ME4202T-D	Heating Ventilation and Air Conditioning(HVAC)

Notes:
1. **For Theory courses: There shall be MSE, ISE and ESE. The ESE is a separate head of passing.**
2. **For Lab courses: There shall be continuous assessment (ISCE consists of ISE and MSE). The ESE is a separate head of passing. MSE result shall be communicated to students in a due time.**

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Multidisciplinary Minor

Course Code	Course	Semester	Course
MEM2201T	Multidisciplinary Minor-I	**IV**	Material Science & Engineering
MEM3201T	Multidisciplinary Minor-II	**V**	Manufacturing Technology
MEM3201L			Manufacturing Technology Lab
MEM3202T	Multidisciplinary Minor-III	**VI**	CAD/CAM
MEM4201T	Multidisciplinary Minor-IV	**VII**	Automobile Engineering
MEM4201L			Automobile Engineering Lab

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TATHAWADE, PUNE-33
(An Autonomous Institute Affiliated to Savitribai Phule Pune University, Pune)

Final Year B. Tech (Mechanical Engineering)
Academic Year -2026-2027 (Semester –VIII)
(Level 6 –B. Tech) -Semester VIII

Track I -Internship Track

Sr. No.	Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks
				L	T	P	Hr	C	ISE	MSE	ESE	
1	**Internship**	**ME4211L**	Industry Internship Program	0	0	45	720	16	ISCE: 300		200	**500**
Total				**0**	**0**	**45**	**720**	**16**				**500**

Track II – Entrepreneurship

Sr. No.	Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks
				L	T	P	Hr	C	ISE	MSE	ESE	
1	**PCC**	**ME4212L**	Startup Incubation	0	0	45	720	16	ISCE: 300		200	**500**
Total				**0**	**0**	**45**	**720**	**16**				**500**

Track III – Higher Studies / Competitive Exam

Sr. No.	Course	Course Code	Course	Teaching Scheme				Credit	Examination Scheme			Total Marks
				L	T	P	Hr	C	ISE	MSE	ESE	
1	**PCC**	**ME4213L**	Competitive Exam Preparation	0	0	45	720	16	ISCE: 300		200	**500**
Total				**0**	**0**	**45**	**720**	**16**				**500**

Abbreviations:
L – Lecture, T – Tutorial, P – Practical, Hr – Hours, C – Credits, TuT – Tutorial, ISE – In Semester Evaluation, MSE – Mid Semester Evaluation, ESE – End Semester Evaluation

Notes:

1. **For Theory courses: There shall be MSE, ISE and ESE. The ESE is a separate head of passing.**
2. **For Lab courses: There shall be continuous assessment (ISCE consists of ISE and MSE). The ESE is a separate head of passing. MSE result shall be communicated to students in a due time.**

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