



**An Autonomous Institute**  
Shree Warana Vibhag Shikshan Mandal's  
**Tatyasaheb Kore Institute of  
Engineering And Technology,  
Warananagar**  
NBA Accredited Institute

# Department of Mechanical Engineering

S. Y. to Final Year B. Tech.  
Mechanical Engineering  
2024-25

**B. Tech. In Mechanical Engineering**  
Syllabus Structure and Curriculum under Autonomy

## SWVSM'S

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar  
An Autonomous Institute

### Abbreviations

Sr.No.	Acronym	Definition
1	ISE	In-Semester Examination
2	ISE-I	In-Semester Examination-I
3	ISE-II	In-Semester Examination-II
4	ESE	End Semester Examination
5	ISA	In-Semester Assessment (Term Work)
6	L	Lecture
7	T	Tutorial
8	P	Practical
9	CH	Contact Hours
10	C	Credit

### Course/ Subject Categories

Sr. No.	Acronym	Definition
1	BSC	Basic Science Course
2	ESC	Engineering Science Course
3	PCC	Professional Core Course
4	OE	Open Elective
5	MDM	Multidisciplinary Minor
6	PEC	Professional Elective Course
7	EEC	Entrepreneurship/Economics/ Management Courses
8	VEC	Value Education Course
9	ELC	Experiential Learning Courses
10	VSEC	Vocational and Skill Enhancement Course
11	AEC	Ability Enhancement Course
12	HSSM	Humanities Social Science and Management



**SWVSM'S**

**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
An Autonomous Institute

**Course/ Subject Categories**

Year of Implementation	UG/PG	Subject Category	Branch	Sem	Course Number
24	UG	PCC	ME	3	01

**Course Term work and POE Code**

Year of Implementation	UG/PG	Subject Category	Branch Code	Sem	Course Number	T- Term work P- POE A- Audit Course
24	UG	PCC	ME	3	01	T/P/A



## SWVSM'S

Tatyasaheb Kore Institute of Engineering and Technology, Warananagar  
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(National Education Policy (NEP) 2020 Structure)

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### Vision

To be a leading Mechanical Engineering department recognized for fostering innovation, academic excellence, and ethical professionalism, contributing significantly to industry advancements and societal welfare.

### MISSION STATEMENTS

- M1 Provide a dynamic learning environment that cultivates technical proficiency, critical thinking, and problem-solving skills among students.
- M2 Foster collaboration with industries to ensure curriculum relevance, facilitate internships, and promote entrepreneurial initiatives.
- M3 Promote a culture of research and innovation, encouraging faculty and students to engage in impactful projects addressing contemporary challenges.
- M4 Prioritize inclusivity by providing equal educational opportunities to all students, especially those from rural and underprivileged backgrounds.
- M5 Instill a commitment to lifelong learning, ethical values, and social responsibility, preparing graduates to make meaningful contributions to society and the environment.



# Second Year B. Tech. In Mechanical Engineering

National Education Policy (NEP) 2020 Structure



**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Second Year B. Tech. (Mechanical Engineering)**

**Semester-III**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2024 - 25)**

Sr. No	Category	Sub Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min for Passing	
1	Programme Course	PCC	23UGPCC-ME301	Mathematics for Mechanical Engineering	3	--	--	2	3	ESE	60	24	40
								ISE	40	16			
			23UGPCC-ME302	Applied Thermodynamics	3	--	--	2	3	ESE	60	24	40
										ISE	40	16	
23UGPCC-ME303	Fluid Mechanics	3	--	--	3	3	ESE	60	24	40			
							ISE	40	16				
23UGPCC-ME304	Material Science and Metallurgy	3		--	2	3	ESE	60	24	40			
							ISE	40	16				
2	Humanities Social Science and Management	EEC	23UGEEC-ME305	Fundamentals of Engineering Economics	3	--	--	2	3	ESE	60	24	40
									ISE	40	16		
		VEC	23UGVEC-ME306L	Personal Values and Ethics	2	--	--	2	2	ISA	50	20	20
3	Multidisciplinary Courses	MDM-1	23UGMDM1-ME307L	Multidisciplinary Minor-1 (Specify MDM Basket)	2	--	--	2	2	ISA	50	20	20
4	Experiential Learning Courses	CEP	23UGCEP-ME308L	Community Connected Project	--	--	2	2	2	ISA	50	20	20
5	Programme Course	PCC	23UGPCC-ME302L	Applied Thermodynamics Lab	--	--	2	1	2	ISA	25	10	10
			23UGPCC-ME303LP	Fluid Mechanics Lab	--	--	2	1	2	ISA	25	10	20
										POE	25	10	
			23UGPCC-ME304LP	Material Science and Metallurgy Lab	--	--	2	1	2	ISA	25	10	20
POE	25	10											
23UGPCC-ME309L	Machine Drawing & Geometric Modeling Lab	--	--	2	1	2	ISA	25	10	10			
					19	0	10	21	29	0	800	320	320



**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Second Year B. Tech. (Mechanical Engineering)**

**Semester-IV**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2024 - 25)**

Sr. No.	Category	Sub Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	C H	Component	Marks	Min for Passing	
1	Programme Course	PCC	23UGPCC-ME401	Analysis of Mechanical Elements	3	--	--	2	3	ESE	60	24	40
			23UGPCC-ME402	Theory of Machines-I	3	--	--	2	3	ISE	40	16	
			23UGPCC-ME403	Manufacturing Processes and Machine Tools	ESE	60	24	40					
					ISE	40	16						
			23UGPCC-ME404	Entrepreneurship/Economics/ Management Courses (EEC) (Specify OE Basket)	ESE	60	24	40					
					ISE	40	16						
23UGOE1-ME405	Open Elective (OE-1) (Specify OE Basket)	ESE	60	24	40								
		ISE	40	16									
23UGMDM2-ME406L	Multidisciplinary Minor-2	2	--	--	2	2	ISA	50	20	20			
4	Skill Courses	VSEC	23UGVSEC-ME407L	C++ Programming Lab	--	--	2	1	2	ISA	50	20	20
5	Humanities Social Science and Management	AEC	23UGAEC-ME408L	Modern Indian language (Specify MIL Basket)	2	--	--	2	2	ISA	25	10	10
		VEC	23UGVEC-ME409L	Sustainability Engineering in Mechanical System	1	--	2	2	2	ISA	50	20	20
6	Programme Course	PCC	23UGPCC-ME401L	Analysis of Mechanical Elements Lab	--	--	2	1	2	ISA	25	10	20
			23UGPCC-ME402LP	Theory of Machines-I Lab	ISA	25	10						
					POE	25	10						
			23UGPCC-ME410LP	Manufacturing Process Lab	ISA	25	10	20					
POE	25	10											
7	Audit Course	A	23UGME411A	Audit Course (Environment Studies)	1	--	--	--	--	--	--	--	
					<b>21</b>	<b>0</b>	<b>10</b>	<b>21</b>	<b>29</b>	<b>0</b>	<b>800</b>	<b>320</b>	<b>320</b>



**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Second Year B. Tech. (Mechanical Engineering)**

**Semester-III & IV**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2024 - 25)**

**Engineering Economics / Entrepreneurship Course (EEC) and Modern Indian Language (MIL) Basket**

Engineering Economics Course Basket Sem. -III			
Category	Sub Category	Course Code	Name of Course
Humanities Social Science and Management	EEC - 1	23UGEEC-ME3051	Economic Analysis of Engineering Projects
		23UGEEC-ME3052	Fundamentals of Engineering Economics
		23UGEEC-ME3053	Engineering Economics for Mechanical Engineers

Engineering Economics Course Basket Sem. -IV			
Category	Sub Category	Course Code	Name of Course
Humanities Social Science and Management	EEC - 2	23UGEEC-ME4041	Industrial Management and Operation Research
		23UGEEC-ME4042	Intellectual Property Rights and Patents
		23UGEEC-ME4043	Start up Management

Modern Indian Language			
Category	Sub Category	Course Code	Name of Course
Humanities Social Science and Management	AEC	23UGAEC-ME4081L	Kanada
		23UGAEC-ME4082L	Marathi
		23UGAEC-ME4083L	Hindi





**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Second Year B. Tech. (Mechanical Engineering)**

**Semester-IV**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2024 - 25)**

**Open Electives Basket Offered**

Sr. No.	Sem.	Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min for Passing	
1	IV	OE-1	23UGOE1-ME4051	Machining Processes (Including CNC)	3	-	-	3	3	ESE	60	24	40
										ISE	40	16	
2	IV	OE-1	23UGOE1-ME4052	Renewable Energy Systems	3	-	-	3	3	ESE	60	24	40
										ISE	40	16	
					6	0	-	6	6		200	80	80

**Exit Option to Qualify Diploma completion of S. Y. B. Tech.**

Sr. No.	Category	Sub Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min for Passing	
1	Skill Courses	VSEC	23UGVSEC-ME411L	CNC Programming	2	-	2	3	4	ISA	50	20	20
2	Experiential Learning Courses	ELC	23UGELC-ME412L	Mini Project	2	-	2	3	4	ISA	50	20	20
3		ELC	23UGELC-ME413L	Internship (2 Weeks)	-	-	6	2	6	ISA	50	20	20
					4	0	10	8	14	0	150	60	60



# Third Year B. Tech. In Mechanical Engineering

National Education Policy (NEP) 2020 Structure



**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Third Year B. Tech. (Mechanical Engineering)**

**Semester-V**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2025 - 26)**

Sr. No.	Category	Sub Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	C H	Component	Marks	Min for Passing	
1	Programme Course	PCC	23UGPCC-ME501	Theory of Machine- II	3	-	-	3	3	ESE	60	24	40
		ISE	40	16	40								
		PCC	23UGPCC-ME502	Heat and Mass Transfer		3	-	-	3	3	ESE	60	24
		ISE	40	16	40								
PCC	23UGPCC-ME503	Design of Machine Elements-I	3	-		-	2	3	ESE	60	24	40	
ISE	40	16	40										
PEC-1	23UGPEC1-ME504	Professional Elective Course-1 (Specify PEC-1 Basket)		3	-	-	2	3	ESE	60	24	40	
ISE	40	16	40										
2	Multidisciplinary Courses	MDM-3		23UGMDM3-ME505	Multidisciplinary Minor-3	3	-	2	4	5	ESE	60	24
		ISE	40	16	40								
OE-2	23UGOE2-ME506	Open Elective (OE) -2 (Specify OE-2 Basket)	3	-		-	3	3	ESE	60	24	40	
ISE	40	16	40										
3	Programme Course	PCC		23UGPCC-ME50LP	Theory of Machine- II Lab	-	-	2	1	2	ISA	25	10
		POE	25	10	20								
		PCC	23UGPCC-ME502LP	Heat and Mass Transfer Lab		-	-	2	1	2	ISA	25	10
		POE	25	10	20								
PCC	23UGPCC-ME503L	Design of Machine Elements-I Lab	-	-		2	1	2	ISA	25	10	30	
POE	50	20	30										
					18	0	10	21	28	0	800	320	320

**Program Electives Courses (PEC) Basket**

PEC - 1			
Category	Sub Category	Course Code	Name of Course
Programme Course	PEC-1	23UGPEC1-ME5041	Manufacturing Engineering
		23UGPEC1-ME5042	Computer Integrated Manufacturing
		23UGPEC1-ME5043	Additives Manufacturing



**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Third Year B. Tech. (Mechanical Engineering)**

**Semester-V**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2024 - 25)**

**Open Electives Basket Offered**

Sr. No.	Sem	Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min for Passing	
1	V	OE-2	23UGOE2-ME5061	Product design and development	2	-	2	3	4	ESE	60	24	40
										ISE	40	16	
2	V	OE-2	23UGOE2-ME5062	Hybrid and Electric Vehicles	2	-	2	3	4	ESE	60	24	40
										ISE	40	16	
					<b>4</b>	<b>0</b>	<b>4</b>	<b>6</b>	<b>8</b>		<b>200</b>	<b>80</b>	<b>80</b>



**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Third Year B. Tech. (Mechanical Engineering)**

**Semester-VI**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2025 - 26)**

Sr. No	Category	Sub Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min for Passing	
1	Programme Course	PCC	23UGPCC-ME601	Metrology and Quality control	3	--	--	2	3	ESE	60	24	40
										ISE	40	16	
			23UGPCC-ME602	Fluid and Turbo Machinery	3	--	--	2	3	ESE	60	24	40
										ISE	40	16	
			23UGPCC-ME603	Design of Machine Elements-II	3	--	--	2	3	ESE	60	24	40
										ISE	40	16	
		PEC-2	23UGPEC2-ME604	Professional Elective Course-2 (Specify PEC-2 Basket)	2	1	--	3	3	ESE	60	24	40
										ISE	40	16	
		PEC-3	23UGPEC3-ME605	Professional Elective Course-3 (Specify PEC-3 Basket)	3	--	--	3	3	ESE	60	24	40
										ISE	40	16	
2	Multidisciplinary Courses	MDM-4	23UGMDM4-ME606L	Multidisciplinary Minor-4	2	--	--	2	2	ISA	50	20	20
3	Skill Courses	VSEC	23UGVSEC-ME607L	Computational Techniques and Programming	2	1	--	2	3	ISA	25	10	10
4	Programme Course	PCC	23UGPCC-ME601LP	Metrology and Quality control Lab	--	--	2	1	2	ISA	25	10	20
										POE	25	10	
			23UGPCC-ME602L	Fluid and Turbo Machinery Lab	--	--	2	1	2	ISA	25	10	10
										POE	25	10	
		23UGPCC-ME603LP	Design of Machine Elements-II Lab	--	--	2	1	2	ISA	25	10	20	
									POE	25	10		
		23UGPCC-ME606L	Additive Manufacturing Lab (3D Printing)	--	--	2	1	2	ISA	50	20	20	
									POE	25	10		
PEC-3	23UGPEC3-ME605LP	Professional Elective Course-3 (Specify PEC-3 Basket)	--	--	2	1	2	ISA	25	10	20		
								POE	25	10			
					18	2	10	21	30	0	800	320	320



**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Third Year B. Tech. (Mechanical Engineering)**

**Semester-VI**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2025 - 26)**

**Program Electives Courses (PEC) Basket**

PEC - 2			
Category	Sub Category	Course Code	Name of Course
Programme Course	PEC-2	23UGPEC2-ME6041	Industrial Fluid Power
		23UGPEC2-ME6042	Advanced Manufacturing Technology
		23UGPEC2-ME6043	Additives Manufacturing

PEC - 3			
Category	Sub Category	Course Code	Name of Course
Programme Course	PEC-3	23UGPEC3-ME6051	Internal Combustion Engine
		23UGPEC3-ME6052	Tribology
		23UGPEC3-ME6053	Piping Design

**Exit Option to Qualify B. Tech. Vocational completion of T. Y. B. Tech**

Sr. No.	Category	Sub Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P			Component	Marks	Min for Passing	
1	Skill Courses	VSEC	23UGVSEC-ME609L	Piping Design	2	--	2	3	4	ISA	50	20	20
2	Experiential Learning Courses	ELC	23UGELC-ME610L	Mini Project	1	--	4	3	5	ISA	50	20	20
3		ELC	23UGELC-ME611L	Industrial Internship (2 Weeks )	--	--	6	2	6	ISA	50	20	20
					3	0	12	8	15	0	150	60	60



# Final Year B. Tech. In Mechanical Engineering

National Education Policy (NEP) 2020 Structure



**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Final Year B. Tech. (Mechanical Engineering)**

**Semester-VII**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2026 - 27)**

Sr. No.	Category	Sub Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min for Passing	
1	Programme Course	PCC	23UGPCC-ME701	Refrigeration and Air Conditioning	3	-	-	2	3	ESE	60	24	40
										ISE	40	16	
		PCC	23UGPCC-ME702	Mechanical System Design	3	-	-	2	3	ESE	60	24	40
										ISE	40	16	
		PEC-4	23UGPEC4-ME703	Professional Elective Course-4 (Specify PEC-4 Basket)	2	-	-	2	2	ESE	60	24	40
										ISE	40	16	
		PEC-5	23UGPEC5-ME704	Professional Elective Course-5 (Specify PEC-5 Basket)	3	-	-	2	3	ESE	60	24	40
										ISE	40	16	
2	Experiential Learning Courses	ELC	23UGELC-ME705	Research Methodology	2	1	-	3	3	ESE	60	24	40
										ISE	40	16	
3	Multidisciplinary Courses	MDM-5	23UGMDM5-ME706L	Multidisciplinary Minor-5	2	-	-	2	2	ISA	50	20	20
4	Programme Course	PCC	23UGPCC-ME701LP	Refrigeration and Air Conditioning Lab	-	-	2	1	2	ISA	25	10	20
										POE	25	10	
		PCC	23UGPCC-ME 702LP	Mechanical System Design Lab	-	-	2	1	2	ISA	25	10	20
										POE	25	10	
PEC-4	23UGPEC4-ME703L	Professional Elective Course-4 (Specify PEC-4 Basket)	-	-	2	1	2	ISA	25	10	10		
								PEC-5	23UGPEC5-ME704L	Professional Elective Course-5 (Specify PEC-5 Basket)	-	-	2
5	Experiential Learning Courses	ELC	23UGELC-ME707LP	Project Phase - I	-	-	4	4	4	ISA	50	20	40
										POE	50	20	
					15	1	12	21	28	0	800	320	320





**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Final Year B. Tech. (Mechanical Engineering)**

**Semester-VII**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2026 - 27)**

**Program Electives Courses (PEC) Basket**

PEC - 4			
Category	Sub Category	Course Code	Name of Course
Programme Course	PEC-4	23UGPEC4-ME7031	Industrial Instrumentation and Control
		23UGPEC4-ME7032	Modeling and Simulation of Manufacturing Systems
		23UGPEC4-ME7033	Power and Energy Engineering

PEC -5			
Category	Sub Category	Course Code	Name of Course
Programme Course	PEC - 5	23UGPEC5-ME7041	Mechatronics
		23UGPEC5-ME7042	Automobile and Electric Vehicles Engineering
		23UGPEC5-ME7043	Total Quality Management



**Tatyasaheb Kore Institute of Engineering and Technology, Warananagar**  
**Final Year B. Tech. (Mechanical Engineering)**

**Semester-VIII**  
**(National Education Policy (NEP) 2020 Structure)**  
**Credit Scheme**  
**(To be implemented from 2026 - 27)**

Sr. No.	Category	Sub Category	Course Code	Name of Course	Teaching Scheme					Examination & Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min for Passing	
1	Programme Course	PCC	23UGPCC-ME801	Finite Element Analysis	3	--	--	3	3	ESE	60	24	40
										ISE	40	16	
		PCC	23UGPCC-ME802	Noise and Vibration	3	--	--	2	3	ESE	60	24	40
										ISE	40	16	
		PEC-6	23UGPEC6-ME803	Professional Elective Course-6 (Specify PEC-6 Basket)	2	--	--	2	2	ESE	60	24	40
										ISE	40	16	
2	Multidisciplinary Courses	MDM-6	23UGMDM6-ME804L	Multidisciplinary Minor-6	2	--	--	2	2	ISA	50	20	20
3	Experiential Learning Courses	ELC	23UGELC-ME805LP	Industrial Internship		--	8	8	8	ISA	100	40	80
										POE	100	40	
4	Programme Course	PCC	23UGPCC-ME801L	Finite Element Analysis Lab	--	--	2	1	2	ISA	25	10	10
										POE	25	10	
		PCC	23UGPCC-ME802LP	Noise and Vibration Lab	--	--	2	1	2	ISA	25	10	20
										POE	25	10	
5	Experiential Learning Courses	ELC	23UGELC-ME806LP	Project Phase -II	--	--	2	2	2	ISA	100	40	40
										POE	75	30	30
					10	0	14	21	24	0	800	320	320

**Program Electives Courses (PEC) Basket**

PEC - 6			
Category	Sub Category	Course Code	Name of Course
Programme Course	PEC-6	23UGPEC6-ME8031	Industrial Engineering
		23UGPEC6-ME8032	Product Design and Development
		23UGPEC6-ME8033	Cryogenics

