

Dr. Babasaheb Ambedkar Technological University Lonere
Department of Mechanical Engineering
Course Structure (as per NEP 2020)
Second Year B. Tech in Mechatronics

Sem III (with effect from AY 2025-26)

Category under NEP	Course Code	Course Title	Teaching Scheme			Evaluation Scheme				Credits
			L	T	P	CA	MSE	ESE	Total	
BSC		Engineering Mathematics- III	2	1	-	20	20	60	100	3
PCC		Material Science and Metallurgy	3	-	-	20	20	60	100	3
PCC	MTX	Analog and Digital Electronics	2	1	-	20	20	60	100	3
PCC		Machine Drawing and CAD	2	-	-	20	20	60	100	2
OE		Renewable Energy Sources	3	-	-	20	20	60	100	3
	Automation	Internet of Things								
		Fluid Mechanics								
MDM		MDM**	3	-	-	20	20	60	100	3
VEC		Constitution of India (Audit)	2	-	-	50	-	-	50	AUDIT
IKS		Life of Bharat Ratna Dr. Babasaheb Ambedkar	1	-	-	50	-	-	50	1
VSEC		Material Science and Metallurgy Lab	-	-	2	60	-	40	100	1
VSEC	MTX	Analog and Digital Electronics lab	-	-	2	60	-	40	100	1
VSEC		Machine Drawing and CAD Lab	-	-	4	60	-	40	100	2
Total			18	2	6	400	120	480	1000	22

MDM to be offered to other departments: Basic Thermodynamics

MDM** (the students will have to choose the MDM course being offered by other disciplines available/offered at the college)

Sem IV (with effect from AY 2025-26)

Category under NEP	Course Code	Course Title	Teaching Scheme			Evaluation Scheme				Credits
			L	T	P	CA	MSE	ESE	Total	
PCC	MTX	Theory of Machines	3	-	-	20	20	60	100	3
PCC	MTX	Drives and Control	2	1	-	20	20	60	100	3
PCC		Strength of Materials	2	1	-	20	20	60	100	3
OE	MTX	Process Instrumentation	2	-	-	20	20	60	100	2
		Numerical Methods in Engineering								
		Introduction to Artificial Intelligence								
		Python Programming								
MDM		MDM**	2	-	-	20	20	60	100	2
VEC		Universal Human Values-II	3	-	-	20	20	60	100	3
IKS		Life of Chhatrapati Shivaji Maharaj	1	-	-	50	-	-	50	1
AEC		Modern Indian Language (Marathi/Hindi/Sanskrit)	2	-	-	20	20	60	100	2
VSEC	MTX	Theory of Machines Lab	-	-	2	60	-	40	100	1
VSEC	MTX	Drives and Control Lab	-	-	2	60	-	40	100	1
VSEC		Strength of Materials Lab	-	-	2	60	-	40	100	1
Total			17	2	6	370	140	540	1050	22

MDM to be offered to other departments: Theory of Machines

Exit Option-II: Qualifier for UG Diploma

Broad areas of Training: (1) CNC Programming-II (2) AutoCAD Drafting of Mechanical Components etc.

- To be completed during vacation after Second Year in the industry/institute.
- This should contain the well-defined project activity which is equivalent to 10 Credits.
- It should be carried out for the duration of 08 Weeks.
- The project/training should be evaluated by a panel of examiners.

Sem V (with effect from AY 2026-27)

Category under NEP	Course Code	Course Title	Teaching Scheme			Evaluation Scheme				Credits
			L	T	P	CA	MSE	ESE	Total	
PCC	MTX	Thermal Engineering	2	1	-	20	20	60	100	3
PCC	MTX	Manufacturing Processes	3	-	-	20	20	60	100	3
PCC	MTX	Sensor Technology	2	1	-	20	20	60	100	3
PCC	MTX	Data Acquisition System	3	-	-	20	20	60	100	3
MDM		MDM**	3	-	-	20	20	60	100	3
PEC		Engineering Tribology	3	-	-	20	20	60	100	3
	MTX	MEMS/NEMS								
	MTX	Product Design Engineering								
		Automobile Engineering								
	MTX	Pneumatics and Hydraulics								
VSEC	MTX	Thermal Engineering Lab	-	-	2	60	-	40	100	1
VSEC	MTX	Workshop Practice-II	-	-	2	60	-	40	100	1
VSEC		Seminar	-	-	2	60	-	40	100	1
OJT		Field /Industrial Training –I (To be started)	-	-	-	-	-	-	-	-
Total			16	2	6	300	120	480	900	21

MDM to be offered to other departments: Manufacturing Processes

MDM** (the students will have to choose the MDM course being offered by other disciplines available/offered at the college)

Sem VI (with effect from AY 2026-27)

Category under NEP	Course Code	Course Title	Teaching Scheme			Evaluation Scheme				Credits
			L	T	P	CA	MSE	ESE	Total	
PCC	Automation	Robotics	2	1	-	20	20	60	100	3
PCC	MTX	Microcontrollers and Interfacing	3	-	-	20	20	60	100	3
PCC		Machine Design-I	2	1	-	20	20	60	100	3
PCC		Metrology and Quality Control	3	-	-	20	20	60	100	3
MDM		MDM**	3	-	-	20	20	60	100	3
PEC		Electric Vehicles	3	-	-	20	20	60	100	3
	MTX	Virtual Instrumentation								
	MTX	Machine Vision System								
	MTX	PLC and SCADA								
	MTX	Control System Engineering								
VSEC	MTX	Microcontrollers and Interfacing Lab	-	-	2	60	-	40	100	1
VSEC		Machine Design Practice - I	-	-	2	60	-	40	100	1
VSEC	MTX	Metrology Lab	-	-	2	60	-	40	100	1
CEP		Technical Project Related to Community Services	-	-	2	60	-	40	100	1
OJT		Field /Industrial Training –I (To be completed)	-	-	-	-	-	-	-	-
Total			16	2	8	360	120	520	1000	22

MDM to be offered to other departments: Strength of Materials

Exit Option-III: Qualifier for UG Bachelor's Degree

- To be completed during vacation after Second Year in the industry/institute.
- This should contain the well-defined project activity which is equivalent to 10 Credits.
- It should be carried out for the duration of 08 Weeks.
- The project/training should be evaluated by a panel of examiners.

Sem VII (with effect from AY 2027-28)

Category under NEP	Course Code	Course Title	Teaching Scheme			Evaluation Scheme				Credits
			L	T	P	CA	MSE	ESE	Total	
PCC	MTX	Embedded Systems	2	1	-	20	20	60	100	3
PCC		CAD/CAM	3	-	-	20	20	60	100	3
PCC		Machine Design -II	2	1	-	20	20	60	100	3
HSSM		Operation Research	3	-	-	20	20	60	100	3
MDM		MDM**	3	-	-	20	20	60	100	3
PEC		Finite Element Method	3	-	-	20	20	60	100	3
		Engineering Economics								
	Automation	Flexible Manufacturing Systems								
	Automation	Product Life Cycle Management								
		Additive Manufacturing								
VSEC	MTX	Embedded Systems Lab	-	-	2	60	-	40	100	1
VSEC		CAD/CAM/CAE Lab	-	-	2	60	-	40	100	1
VSEC		Machine Design Practice -II	-	-	2	60	-	40	100	1
RP		Mini Project	-	-	4	60	-	40	100	2
OJT		Field /Industrial Training –I (To be evaluated)	-	-	-	-	-	100	100	2
		Total	16	2	10	360	120	620	1100	25

MDM to be offered to other departments: Machine Design

Sem VIII (with effect from AY 2027-28)

Category under NEP	Course Code	Course Title	Teaching Scheme			Evaluation Scheme				Credits
			L	T	P	CA	MSE	ESE	Total	
PCC		NPTEL/SWAYAM	4	-	-	25	-	75	100	4
PCC		NPTEL/SWAYAM	4	-	-	25	-	75	100	4
RM		Research Methodology through NPTEL/SWAYAM/MOOC or Online mode	3	-	-	25	-	75	100	3
RP/FP		Field/Internship Project OR In-house Project	-	-	20	60	-	40	100	10
		Total	11	-	20	135	-	265	400	21

AEC: Ability Enhancement Courses

BSC: Basic Science Course

CEP: Community engagement project

FP: Field Project

HSSM: Courses on Humanities, Social Science, and Management

IKS: Indian Knowledge System

MDM: Multidisciplinary Minor

OE: Open Elective (OE) Other than a particular program

OJT: On Job Training

PCC: Programme Core Course

PEC: Programme Elective Course

RM: Research Methodology

RP: Research Project

VEC: Value Education Course

VSEC: Vocational and Skill Enhancement Course

**Semester wise Credit distribution structure for Four Year B tech in Mechatronics Program - One Major, One Minor
(as per NEP 2020)**

		I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course	BSC/ESC	(07) 06-08	(07+02*) 08-10	(03)						(17+02*)) 16-18
Engineering Science Course		(07) 08-10	(10) 04-06							(17) 12-16
Programme Core Course (PCC)	Program Courses		02	(08) 8-10	(09) 8-10	(12) 10-12	(12) 8-10	(09) 04-06	04-06	(50) 44-56
Programme Elective Course (PEC)						(03) 04	(03) 08	(03) 02	(08) 06	(17) 20
Multidisciplinary Minor (MD M)	Multidisciplinary Courses			(03) 02	(02) 02	(03) 04	(03) 02	(03) 02	02	(14) 14
Open Elective (OE) Other than a particular program				(03) 04	(02) 02	02				(05) 08
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	(02) 02	(02)02	(04)	(03) 02	(03)	(03) 02	(03)		(20) 08
Ability Enhancement Course (AEC -01, AEC-02)	Humanities Social Science and Management (HSSM)	(03) 02			(02) 02					(05) 04
Entrepreneurship/Economics/ Management Courses				02	02			(03)		(03) 04
Indian Knowledge System (IKS)			(02) 02	(01)	(01)					(04) 02
Value Education Course (VEC)				(02*) 02	(03) 02					(03+02*)) 04
Research Methodology	Experiential Learning Courses								(03) 04	(03) 04
Comm. Engg. Project (CEP)/Field Project (FP)				02			(01)			(01) 02
Project								(02)	04	(02) 04
Internship/ OJT								(02) 12	(10)	(12) 12
Co-curricular Courses (CC)	Liberal Learning Courses	(02) 02	(02) 02							(04) 04
Total Credits (Major)		(21) 20-22	(23) 20-22	(21) 20-22	(22) 20-22	(21) 20-22	(22) 20-22	(25) 20-22	(22) 20-22	(177) 160-176

* Audit Course