Semester Wise Course Curriculum Structure for B. Tech Programme

(Mechanical Engineering)

Semester – I

Sl. No.	Category	Course Type	Course Code	Course Title	Hours per week				Credits	Hrs./ Week	Hrs./ Sem
					L	P	T	E			
1	-		-	Induction Program	-	-	-	-	-	-	60
2	BSC	L+T	**MA101**	Mathematics I	3	0	1	0	3	4	48
3	ESC/ESC	L+T	**EE100/ EC101**	Basic Electrical Engineering/ Basic Electronics	3	0	1	0	3	4	48
4	BSC/ESC	L+T	ME131	Physics/Basic Thermal Engineering	3	0	1	0	3	4	48
5	BSC/VAC	L		Green Chemistry/ Biology & Environmental Science	3	0	0	0	3	3	36
6	BSC/ESC	P	**PH181** /ME181	Physics Lab/Computer Aided Drawing & Graphics Lab	0	3	0	0	2	3	36
7	ESC/ESC	P	**EE170 / EC171**	Basic Electrical Engineering Lab/Basic Electronics Lab	0	3	0	0	2	3	36
8	ESC	L+P		Python Programming	1	3	0	0	3	4	48
9	VAC	E	**XC191 / XC192**	Life Skills – I/II	0	0	0	2	1	2	30
Total									**20**	**27**	**390**

Semester – II

Sl. No.	Category	Course Type	Course Code	Course Title	Hours per week				Credits	Hrs./ week	Hrs./ Sem
					L	P	T	E			
1	BSC	L+T	**MA102**	Mathematics II	3	0	1	0	3	4	48
2	ESC/ESC	L+T	**EE100/ EC101**	Basic Electrical Engineering/ Basic Electronics	3	0	1	0	3	4	48
3	BSC/ESC	L+T	**PH181 /ME131**	Physics/ Basic Thermal Engineering	3	0	1	0	3	4	48
4	BSC/VAC	L		Green Chemistry/ Biology & Environmental Science	3	0	0	0	3	3	36
5	BSC/ESC	P	/ME181	Physics Lab/Computer Aided Drawing & Graphics Lab	0	3	0	0	2	3	36
6	ESC/ESC	P	**EE170 / EC171**	Basic Electrical Engineering Lab/Basic Electronics Lab	0	3	0	0	2	3	36
7	AEC	P		Professional Communication	0	3	0	0	2	3	36
8	BSC	P		Mathematics Lab	0	3	0	0	2	3	36
9	VAC	E	**XC191 / XC192**	Life Skills – I/II	0	0	0	2	1	2	30
				Total					**21**	**29**	**354**

Semester – III

Sl. No.	Category	Course Type	Course Code	Course Title	Hours per week				Credits	Hrs./ week	Hrs./ Sem
					L	P	T	E			
1	BSC	L+T		Mathematics III	3	0	1	0	3	4	48
2	ESC	L+T		Programming in C & Data Structure	3	0	1	0	3	4	48
3	PCC	L+T	ME 211	Mechanics of Rigid and Deformable Bodies	3	0	1	0	3	4	48
4	PCC	L	ME231	Engineering Thermodynamics	3	0	0	0	3	3	36
5	ESC	P		C & Data Structure Lab	0	3	0	0	2	3	36
6	PCC	P	ME281	Components Solid Modeling Lab	0	3	0	0	2	3	36
7	PCC	P	ME271	Manufacturing Processes Lab	0	3	0	0	2	3	36
8	SEC	P		SDE - I	0	3	0	0	2	3	36
9	VAC	L		Universal Human Values II	3	0	0	0	3	3	36
Total									23	30	360

Semester – IV

Sl. No.	Category	Course Type	Course Code	Course Title	L	P	T	E	Credits	Hrs./ week	Hrs./ Sem
						Hours per week					
1	ESC	L+T		Database Management Systems	3	0	1	0	3	4	48
2	PCC	L+T	ME212	Theory of Machines and Mechanisms	3	0	1	0	3	4	48
3	PCC	L+T	ME232	Heat Transfer	3	0	1	0	3	4	48
4	PEC	L	Program Elective		3	0	0	0	3	3	36
5	ESC	P		Database Management Systems Lab	0	3	0	0	2	3	36
6	PCC	P	ME282	Computational Stress Analysis Lab	0	3	0	0	2	3	36
7	PCC	P	ME272	Heat Transfer Lab	0	3	0	0	2	3	36
8	SEC	P		SDE - II	0	3	0	0	2	3	36
9	ESC	L		Innovation by Design (MOOCS – NPTEL)	1	0	0	0	1	1	12
10	AEC	E		CDT - I	0	0	0	2	1	2	30
Total									**22**	**30**	**366**

PROGRAM ELECTIVES

Engineering Materials	ME214	Metrology, Instrumentation, and Control	ME222	Refrigeration and Air Conditioning	ME334
Mechanics of Composite Materials	ME216	Additive Manufacturing	ME224	I/C Engine and Applications	ME234
Advanced Mechanics of Solids	ME218	Advanced Manufacturing Processes	ME425	Turbomachines	ME236
Mechanical Vibration	ME312	Welding Technology	ME328	Introduction to Cryogenic Engineering	ME431
Fracture Mechanics	ME314	Computer Integrated Manufacturing	ME325	Computational Fluid Dynamics	ME331

Robotics	ME316	Quality Control and Reliability	ME323	Renewable Energy Systems	ME432
Theory of Elasticity and Plasticity	ME318	Optimization Techniques in Engineering	ME226	Automotive Engineering	ME238
Railway Engineering	ME411	Problems in Production Engineering	ME423	Aircraft and Rocket Propulsion	ME333
Problems in Machine Design	ME413	Special Topic in Production Engineering	ME422	Problems in Thermal Engineering	ME433
Special Topic in Machine Design	ME415			Special Topic in Thermal Engineering	ME434
Finite Element Techniques in Structural Analysis	ME412				

❖ **CDT – I will comprise of Aptitude & Reasoning for Placements.**

Semester – V

Sl. No.	Category	Course Type	Course Code	Course Title	Hours per week				Credits	Hrs./ Week	Hrs./ Sem
					L	P	T	E			
1	ESC	L+T		Introduction to AI & ML	3	0	1	0	3	4	48
2	PCC	L+T	ME311	Machine Design	3	0	1	0	3	4	48
3	PCC	L+T	ME321	Metal Cutting	3	0	1	0	3	4	48
4	PEC	L	Program Elective		3	0	0	0	3	3	36
5	ESC	P		AI & ML Lab	0	3	0	0	2	3	36
6	PCC	P	ME381	Computer Integrated Manufacturing Lab	0	3	0	0	2	3	36
7	PCC	P	ME371	HVAC and R Lab	0	3	0	0	2	3	36
8	SEC	P		SDE - III	0	3	0	0	2	3	36
9	VAC	P		Emerging Digital Skills (To be decided by Department)	0	3	0	0	2	3	36
10	AEC	L		CDT - II	0	0	0	2	1	2	30
Total									**23**	**32**	**390**

PROGRAM ELECTIVES

Engineering Materials	ME214	Metrology, Instrumentation, and Control	ME222	Refrigeration and Air Conditioning	ME334
Mechanics of Composite Materials	ME216	Additive Manufacturing	ME224	I/C Engine and Applications	ME234
Advanced Mechanics of Solids	ME218	Advanced Manufacturing Processes	ME425	Turbomachines	ME236
Mechanical Vibration	ME312	Welding Technology	ME328	Introduction to Cryogenic Engineering	ME431
Fracture Mechanics	ME314	Computer Integrated Manufacturing	ME325	Computational Fluid Dynamics	ME331
Robotics	ME316	Quality Control and Reliability	ME323	Renewable Energy Systems	ME432

Theory of Elasticity and Plasticity	ME318	Optimization Techniques in Engineering	ME226	Automotive Engineering	ME238
Railway Engineering	ME411	Problems in Production Engineering	ME423	Aircraft and Rocket Propulsion	ME333
Problems in Machine Design	ME413	Special Topic in Production Engineering	ME422	Problems in Thermal Engineering	ME433
Special Topic in Machine Design	ME415			Special Topic in Thermal Engineering	ME434
Finite Element Techniques in Structural Analysis	ME412				

❖ **CDT – II will be Soft Skills preparation.**

Semester – VI

Sl. No.	Category	Course Type	Course Code	Course Title	Hours per week				Credits	Hrs./ week	Hrs./ Sem
					L	P	T	E			
1	PCC	L+T	ME322	Primary Manufacturing Processes	3	0	1	0	3	4	48
2	PCC	L+T	ME324	Industrial Automation	3	0	1	0	3	4	48
3	PCC	L	ME332	Fluid Mechanics	3	0	0	0	3	3	36
4	PEC	L	Program Elective		3	0	0	0	3	3	36
5	PCC	P	ME372	Machine Design and Dynamics Lab	0	3	0	0	2	3	36
6	PCC	P	ME374	Additive and Advanced Manufacturing Lab	0	3	0	0	2	3	36
7	SEC	P		SDE - IV	0	3	0	0	2	3	36
8	RP	P		Major Project - I	0	0	0	4	2	4	60
9	ESC	L		Patent & IPR (MOOCS – NPTEL)	1	0	0	0	1	1	12
10	AEC	E		CDT - III	0	0	0	2	1	2	30
Total									**22**	**30**	**378**

PROGRAM ELECTIVES

Engineering Materials	ME214	Metrology, Instrumentation, and Control	ME222	Refrigeration and Air Conditioning	ME334
Mechanics of Composite Materials	ME216	Additive Manufacturing	ME224	I/C Engine and Applications	ME234
Advanced Mechanics of Solids	ME218	Advanced Manufacturing Processes	ME425	Turbomachines	ME236
Mechanical Vibration	ME312	Welding Technology	ME328	Introduction to Cryogenic Engineering	ME431

Fracture Mechanics	ME314	Computer Integrated Manufacturing	ME325	Computational Fluid Dynamics	ME331
Robotics	ME316	Quality Control and Reliability	ME323	Renewable Energy Systems	ME432
Theory of Elasticity and Plasticity	ME318	Optimization Techniques in Engineering	ME226	Automotive Engineering	ME238
Railway Engineering	ME411	Problems in Production Engineering	ME423	Aircraft and Rocket Propulsion	ME333
Problems in Machine Design	ME413	Special Topic in Production Engineering	ME422	Problems in Thermal Engineering	ME433
Special Topic in Machine Design	ME415			Special Topic in Thermal Engineering	ME434
Finite Element Techniques in Structural Analysis	ME412				

❖ **CDT – III will be done by the Department. (Interview preparation related to department & Comprehensive viva-voce)**

<u>Semester – VII</u>

Sl. No.	Category	Course Type	Course Code	Course Title	Hours per week				Credits	Hrs./ week	Hrs./S em
					L	P	T	E			
1	PCC	L+T	ME421	Industrial Engineering and Management	3	0	1	0	3	4	48
2	PEC	L	Program elective		3	0	0	0	3	4	36
3	OEC	L	Open elective		3	0	0	0	3	3	36
4	PCC	P	ME471	Energy Conversion Lab	0	2	0	0	2	3	36
5	SI	P		Summer Internship - I	0	0	0	2	1	2	30
6	RP	P		Major Project - II	0	0	0	8	4	8	120

7	VAC	L		VAC Elective	1	0	0	0	1	1	12
Total									**17**	**25**	**318**

PROGRAM ELECTIVES

Engineering Materials	ME214	Metrology, Instrumentation, and Control	ME222	Refrigeration and Air Conditioning	ME334
Mechanics of Composite Materials	ME216	Additive Manufacturing	ME224	I/C Engine and Applications	ME234
Advanced Mechanics of Solids	ME218	Advanced Manufacturing Processes	ME425	Turbomachines	ME236
Mechanical Vibration	ME312	Welding Technology	ME328	Introduction to Cryogenic Engineering	ME431
Fracture Mechanics	ME314	Computer Integrated Manufacturing	ME325	Computational Fluid Dynamics	ME331
Robotics	ME316	Quality Control and Reliability	ME323	Renewable Energy Systems	ME432
Theory of Elasticity and Plasticity	ME318	Optimization Techniques in Engineering	ME226	Automotive Engineering	ME238
Railway Engineering	ME411	Problems in Production Engineering	ME423	Aircraft and Rocket Propulsion	ME333
Problems in Machine Design	ME413	Special Topic in Production Engineering	ME422	Problems in Thermal Engineering	ME433
Special Topic in Machine Design	ME415			Special Topic in Thermal Engineering	ME434
Finite Element Techniques in Structural Analysis	ME412				

Semester – VIII

Sl. No.	Category	Course Type	Course Code	Course Title	Hours per week				Credits	Hrs./ week	Hrs./ Sem
					L	P	T	E			
1	PEC	L	Program elective	PEL5	3	0	0	0	3	3	36
2	OEC	L	Open elective		3	0	0	0	3	3	36
3	RP	P		Major Project - III	0	0	0	8	4	8	120
4	RP	P		Project Linked Research Paper/Product	0	0	0	4	2	4	60
Total									**12**	**18**	**252**

PROGRAM ELECTIVES

Engineering Materials	ME214	Metrology, Instrumentation, and Control	ME222	Refrigeration and Air Conditioning	ME334
Mechanics of Composite Materials	ME216	Additive Manufacturing	ME224	I/C Engine and Applications	ME234
Advanced Mechanics of Solids	ME218	Advanced Manufacturing Processes	ME425	Turbomachines	ME236
Mechanical Vibration	ME312	Welding Technology	ME328	Introduction to Cryogenic Engineering	ME431
Fracture Mechanics	ME314	Computer Integrated Manufacturing	ME325	Computational Fluid Dynamics	ME331
Robotics	ME316	Quality Control and Reliability	ME323	Renewable Energy Systems	ME432
Theory of Elasticity and Plasticity	ME318	Optimization Techniques in Engineering	ME226	Automotive Engineering	ME238
Railway Engineering	ME411	Problems in Production Engineering	ME423	Aircraft and Rocket Propulsion	ME333
Problems in Machine Design	ME413	Special Topic in Production Engineering	ME422	Problems in Thermal Engineering	ME433

Special Topic in Machine Design	ME415			Special Topic in Thermal Engineering	ME434
Finite Element Techniques in Structural Analysis	ME412				

❖ **Project Linked Research Paper/Product is mandatory for all the students.**

NOMENCLATURE

BSC	BASIC SCIENCE COURSES
ESC	ENGINEERING SCIENCE COURSES
VAC	VALUE ADDED COURSES
AEC	ABILITY ENHANCEMENT COURSES
PCC	PROGRMME CORE COURSES
PCP	PROGRAMME CORE PRACTICAL
PCL	PROGRAMME CORE LAB
PEC	PROGRAMME ELECTIVE COURSE
RP	RESEARCH PROJECT
OEC	OPEN ELECTIVE COURSES
SI	SUMMER INTERNSHIP
SEC	SKILL ELECTIVE COURSES