

**Course Structure
of
B. Tech. (Mechanical Engineering)
(with effect from session 2024-25)**



**Faculty of Engineering & Technology
Jamia Millia Islamia
New Delhi**

July 2024

Contents

B. Tech. (Mechanical Engg.)	3
I Semester	3
II Semester	3
III Semester	4
IV Semester	4
V Semester	5
VI Semester	5
VII Semester	6
VIII Semester	6
Honours Degree in Numerical Heat Transfer & Fluid Mechanics	7
Honours Degree in Materials & Manufacturing	8
Honours Degree in Tribology	9
Minor Degree in Engineering Management	10
Minor Degree in Design Thinking & Innovation	11

B. Tech. (Mechanical Engg.)

		I Semester							
S. No.	COURSE NUMBER	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1	AST-101	Communication Skills	Theory	HSMC	2	2	0	0	2
2	ASB-101	Engineering Physics I	Theory	BSC	3	3	0	0	3
3	ASB-102	Engineering Chemistry	Theory	BSC	3	3	0	0	3
4	ASB-103	Engineering Mathematics I	Theory	BSC	3	3	0	0	3
5	EES-101	Basics of Electrical Engineering	Theory	ESC	3	3	0	0	3
6	CSS-101	Fundamentals of Computing	Theory	ESC	3	3	0	0	3
7	ASM-101	Environmental Science	Theory	MC-I	2	2	0	0	2
i	ASL-101	Language Laboratory	Lab	HSMC	1	0	0	2	2
ii	ASL-102	Engineering Physics Laboratory I	Lab	BSC	1	0	0	2	2
iii	ASL-103	Engineering Chemistry Laboratory	Lab	BSC	1	0	0	2	2
iv	MEL-104	Engineering Graphics & Design	Lab	BSC	2	0	0	4	4
				Total	24	19	0	10	29
		II Semester							
S. No.		COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1	ASB-201	Engineering Physics II	Theory	BSC	3	3	0	0	3
2	ASB-202	Engineering Mathematics II	Theory	BSC	3	3	0	0	3
3	ASB-203	Biology for Engineers	Theory	BSC	3	3	0	0	3
4	ECS-201	Basics of Electronics & Communication Engineering	Theory	ESC	3	3	0	0	3
5	MES-201	Basics of Mechanical Engineering	Theory	ESC	3	3	0	0	3
6	CES-201	Basics of Civil Engineering	Theory	ESC	3	3	0	0	3
7	ASM-201	Constitution of India	Theory	MC-II (Audit)	0	2	0	0	2
i	ASL-201	Engineering Physics Laboratory II	Lab	BSC	1	0	0	2	2
ii	MEL-201	Workshop Practice	Lab	ESC	2	0	0	4	4
iii	MEL-202	Engineering Mechanics Laboratory	Lab	ESC	1	0	0	2	2
iv	MEL-201	Design Thinking & Idea Lab	Lab	ESC	1	0	0	2	2
				Total	23	20	0	10	30

		III Semester							
S. No.	COURSE NUMBER	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1	ASM-301	Universal Human Values	Theory	MC-II	3	3	0	0	3
2	ASB-301	Engineering Mathematics III	Theory	BSC	3	3	0	0	3
3	MEC-301	Mechanics of Solids	Theory	PCC	3	3	0	0	3
4	MEC-302	Fluid Mechanics	Theory	PCC	3	3	0	0	3
5	MEC-303	Manufacturing Processes	Theory	PCC	3	3	0	0	3
6	MEC-304	Material Science	Theory	PCC	3	3	0	0	3
7	ASM-302	Essence of Indian Traditional Knowledge	Theory	MC-IV (Audit)	0	2	0	0	2
i	MEL-301	Mechanics of Solids Laboratory	Lab	PCC	1	0	0	2	2
ii	MEL-302	Fluid Mechanics Laboratory	Lab	PCC	1	0	0	2	2
iii	MEL-303	Manufacturing Processes Laboratory	Lab	PCC	1	0	0	2	2
iv	MEL-304	Material Science Laboratory	Lab	PCC	1	0	0	2	2
				Total	22	20	0	8	28
		IV Semester							
S. No.	COURSE NUMBER	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1	MEC-401	CAD and FEM	Theory	PCC	3	3	0	0	3
2	MEC-402	Production Engineering-I	Theory	PCC	3	3	0	0	3
3	MEC-403	Heat and Mass Transfer	Theory	PCC	3	3	0	0	3
4	AST-401	Operations Research	Theory	HSMC (OEC I)	3	3	0	0	3
5	AST-402	Economics	Theory	HSMC (OEC II)	3	3	0	0	3
i	MEL-401	CAD, FEM and Computer aided Machine Drawing Laboratory	Lab	PCC	1	0	0	2	2
ii	MEL-402	Production Engineering Laboratory	Lab	PCC	1	0	0	2	2
iii	MEL-403	Heat & Mass Transfer Laboratory	Lab	PCC	1	0	0	2	2
iv	ASL-401	Numeric and Scientific Computing Lab.	Lab	ESC	2	0	0	4	4
				Total	20	15	0	10	25

		V Semester							
S. No.	COURSE NUMBER	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1	MEC-501	Advanced Fluid Mechanics & Control Engg.	Theory	PCC	3	3	0	0	3
2	MEC-502	Applied Thermodynamics	Theory	PCC	3	3	0	0	3
3	MEC-503	Kinematics of Machines	Theory	PCC	3	3	0	0	3
4	MEC-504	Design of Mechanical Components	Theory	PCC	3	3	0	0	3
5	MEC-505	Production Engineering-II	Theory	PCC	3	3	0	0	3
6	MEE-501	Mechatronics	Theory	PEC	3	3	0	0	3
i	MEL-501	Instrumentation, Measurement & Control Laboratory	Lab	PCC	1	0	0	2	2
ii	MEL-502	Kinematics of Machines Laboratory	Lab	PCC	1	0	0	2	2
iii	MEL-503	Design of Mechanical Components Practice Laboratory	Lab	PCC	1	0	0	2	2
iv	MEL-504	Mechatronics Laboratory	Lab	PCC	1	0	0	2	2
				Total	22	18	0	8	26
		VI Semester							
S. No.	COURSE NUMBER	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1	MEC-601	Fluid Machines	Theory	PCC	3	3	0	0	3
2	MEC-602	Refrigeration and Air conditioning	Theory	PCC	3	3	0	0	3
3	MEC-603	Design of Mechanical System	Theory	PCC	3	3	0	0	3
4	MEC-604	Computer Aided Manufacturing	Theory	PCC	3	3	0	0	3
5	MEE-601	Electro-Mechanical Energy Conversion	Theory	PEC	3	3	0	0	3
i	MEL-601	Fluid Machines Laboratory	Lab	PCC	1	0	0	2	2
ii	MEL-602	Refrigeration and Air Conditioning Lab	Lab	PCC	1	0	0	2	2
iii	MEL-603	Design of Mechanical Systems Practice Laboratory	Lab	PCC	1	0	0	2	2
iv	MEL-604	Computer Aided Manufacturing Lab	Lab	PCC	1	0	0	2	2
v	MEP-601	Seminar (Literature Review)		PROJ	1	0	0	2	2
				Total	20	15	0	10	25

		VII Semester							
S. No.	COURSE NUMBER	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1	MEE-701	Industrial Engineering	Theory	PEC	3	3	0	0	3
2	MEE-702	I. C. Engines	Theory	PEC	3	3	0	0	3
3	MEE-703	Machinery Dynamics & Vibration	Theory	PEC	3	3	0	0	3
4	MEO-701	Elective (THERMAL & FLUID)	Theory	OEC	3	3	0	0	3
i	MEL-701	Industrial Engineering Laboratory	Theory	OEC	3	3	0	0	3
ii	MEL-702	Heat Engines & Solar Energy Laboratory							
iii	MEL-703	Machinery Dynamics & Vibration Laboratory							
iv	MEP-701	Summer Internship	Project-II	PROJ	2	0	0	4	4
v	MEP-702	Project	Project-III	PROJ	3	0	0	6	6
				Total	20	15	0	10	25
		VIII Semester							
S. No.	COURSE NUMBER	COURSE NAME	COURSE TYPE		Credits	L	T	P	HRS
1	MEO-801	Elective (MACHINE DESIGN) *	Theory	OEC	3	3	0	0	3
2	MEO-801	Elective (PRODUCTION& INDUSTRIAL) *	Theory	OEC	3	3	0	0	3
i	MEP-801	Project	Project-IV	PROJ	6	0	0	12	12
				Total	12	6	0	12	18
				Grand Total	163				

***In case of semester long project work done in industry or internship,
the OECs in VIII semester may be offered in online mode/NPTEL on SWAYAM.**

		Honours Degree in Numerical Heat Transfer & Fluid Mechanics							
		IV Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
1	MEH-411	Advanced Thermodynamics	Theory		3	3	0	0	3
		V Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
2	MEH-511	Computational Fluid Dynamics	Theory		3	3	0	0	3
i	MEL-521	Lab 1	Lab		1	0	0	2	2
		VI Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
3	MEH-611	Numerical Methods in Heat Transfer	Theory		3	3	0	0	3
ii	MEL-621	Lab 2	Lab		1	0	0	2	2
		VII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
4	MEH-711	Turbomachines	Theory		3	3	0	0	3
iii	MEL-721	Lab 3	Lab		1	0	0	2	2
		VIII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
5	MEH-811	Advanced Fluid Mechanics	Theory		3	3	0	0	3
				Total	18	15	0	6	21

		Honours Degree in Materials & Manufacturing							
		IV Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
1	MEH-421	Automation in manufacturing	Theory		3	3	0	0	3
		V Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
2	MEH-521	Advanced materials	Theory		3	3	0	0	3
i	MEL-522	Lab 1	Lab		1	0	0	2	2
		VI Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
3	MEH-621	Finishing and Superfinishing Processes	Theory		3	3	0	0	3
ii	MEL-622	Lab 2	Lab		1	0	0	2	2
		VII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
4	MEH-721	Additive manufacturing	Theory		3	3	0	0	3
iii	MEL-722	Lab 3	Lab		1	0	0	2	2
		VIII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
5	MEH-821	Micro-nano manufacturing	Theory		3	3	0	0	3
				Total	18	15	0	6	21

		Honours Degree in Tribology							
		IV Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE	Credits	L	T	P	HRS	
1	MEH-431	Introduction to Tribology	Theory	3	3	0	0	3	
		V Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE	Credits	L	T	P	HRS	
2	MEH-531	Tribology of Advanced Materials	Theory	3	3	0	0	3	
i	MEL-523	Mechanical Properties of Composites Lab	Lab	1	0	0	2	2	
		VI Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE	Credits	L	T	P	HRS	
3	MEH-631	Condition Monitoring & Fault Analysis	Theory	3	3	0	0	3	
ii	MEL-623	Machine Condition Monitoring Lab	Lab	1	0	0	2	2	
		VII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE	Credits	L	T	P	HRS	
4	MEH-731	Green & Nano Tribology	Theory	3	3	0	0	3	
iii	MEL-723	Tribological System Design Lab	Lab	1	0	0	2	2	
		VIII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE	Credits	L	T	P	HRS	
5	MEH-831	Mechanics of Bio-tribology	Theory	3	3	0	0	3	
			Total	18	15	0	6	21	

		Minor Degree in Engineering Management							
		IV Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
1	MED-411	Financial Management	Theory		3	3	0	0	3
		V Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
2	MED-511	Supply chain Modelling and Management	Theory		3	3	0	0	3
i	MEL-524	Supply chain Modelling and Analytics Lab	Lab		1	0	0	2	2
		VI Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
3	MED-611	Technology Management	Theory		3	3	0	0	3
ii	MEL-624	Project Management Lab	Lab		1	0	0	2	2
		VII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
4	MED-711	Product Management	Theory		3	3	0	0	3
iii	MEL-724	Data Science Lab	Lab		1	0	0	2	2
		VIII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
5	MED-811	Marketing Management	Theory		3	3	0	0	3
				Total	18	15	0	6	21

		Minor Degree in Design Thinking & Innovation							
		IV Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
1	MED-421	Design Thinking	Theory		3	3	0	0	3
		V Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
2	MED-521	Human Centered Design	Theory		3	3	0	0	3
i	MEL-525	Design Thinking lab.	Lab		1	0	0	2	2
		VI Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
3	MED-621	Product Design I	Theory		3	3	0	0	3
ii	MEL-625	Ideation Lab.	Lab		1	0	0	2	2
		VII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
4	MED-721	Innovative Product Design	Theory		3	3	0	0	3
iii	MEL-725	Design Prototyping Lab.	Lab		1	0	0	2	2
		VIII Semester							
S. No.		COURSE NO. & NAME	COURSE TYPE		Credits	L	T	P	HRS
5	MED-821	Start-Up formation	Theory		3	3	0	0	3
				Total	18	15	0	6	21