

## Curriculum for Undergraduate Degree (B. Tech.) in Mechanical Engineering (w.e.f. AY: 2020-21)

### Part II: Course Structure & Semester wise Credit Distribution

First Semester (First Year)							
Mandatory Induction Program- 3 Weeks Duration							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	BS	BS-CH101	Chemistry	3	1	0	4
2	BS	BS-M101	Mathematics-I	3	1	0	4
3	ES	ES-CS101	Programming for Problem Solving	3	0	0	3
Total Theory				9	2	0	11
Practical/ Sessional							
1	BS	BS-CH191	Chemistry Laboratory	0	0	3	1.5
2	ES	ES-CS191	Programming for Problem Solving Lab	0	0	4	2
3	ES	ES-ME192	Workshop/ Manufacturing Practices	1	0	4	3
4	HM	HM-HU191	Language Laboratory	0	0	2	1
Total Practical/ Sessional/ Mandatory Course				1	0	13	7.5
Total of First Semester				10	2	13	18.5

Second Semester (First Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	BS	BS-PH201	Physics	3	1	0	4
2	BS	BS-M202	Mathematics-II	3	1	0	4
3	ES	ES-EE201	Basic Electrical & Electronics Engineering	4	0	0	4
4	HM	HM-HU201	English	2	0	0	2
	Total Theory			12	2	0	14
Practical/ Sessional							
1	BS	BS-PH291	Physics Laboratory	0	0	3	1.5
2	ES	ES-EE291	Basic Electrical & Electronics Engineering Lab	0	0	4	2
3	ES	ES-ME291	Engineering Graphics & Design	1	0	4	3
	Total Practical/ Sessional/Mandatory Course			1	0	10	6.5
Total of Second Semester				13	2	10	20.5



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Third Semester (Second Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	BS	BS-M303	Mathematics III	2	1	0	3
2	BS	BS-BIO301	Biology	2	0	0	2
3	ES	ES-ME301	Materials Engineering	3	0	0	3
4	ES	ES-ME302	Engineering Mechanics	3	1	0	4
5	PC	PC-ME301	Thermodynamics	3	1	0	4
6	PC	PC-ME302	Basic Manufacturing Processes	4	0	0	4
	Total Theory			17	3	0	20
Practical/ Sessional							
1	PC	PC-ME391	Basic Manufacturing Processes Lab	0	0	3	1.5
	Total Practical/ Sessional/Mandatory Course			0	0	3	1.5
	Total of Third Semester			17	3	3	21.5



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Fourth Semester (Second Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	BS	BS- M404	Numerical methods	2	0	0	2
2	PC	PC-ME401	Applied Thermodynamics	3	1	0	4
3	PC	PC-ME402	Fluid Mechanics & Fluid Machines	3	1	0	4
4	PC	PC-ME403	Strength of Materials	4	0	0	4
5	PC	PC-ME404	Metrology and Instrumentation	4	0	0	4
6	MC	MC471	Environmental Science	2	0	0	0
	Total Theory			15	3	2	18
Practical/ Sessional							
1	PC	PC-ME491	Metrology and Instrumentation Lab	0	0	3	1.5
2	PC	PC-ME492	Machine Drawing- I	0	0	3	1.5
	Total Practical/ Sessional/Mandatory Course			0	0	6	3
	Total of Fourth Semester			15	3	8	21

Fifth Semester (Third Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	HM	HM-HU503	Principles of Management	2	0	0	2
2	PC	PC-ME501	Heat Transfer	3	1	0	4
3	PC	PC-ME502	Solid Mechanics	3	1	0	4
4	PC	PC-ME503	Kinematics & Theory of Machines	3	1	0	4
5	MC	MC571	Aptitude Skill Development-I	2	0	0	0
	Total Theory			15	3	0	14
Practical/ Sessional							
1	PC	PC-ME591	Thermal Engineering Lab	0	0	3	1.5
2	PC	PC-ME592	Machine Drawing-II	0	0	3	1.5
3	PW	PW-ME581	Project-I (30 hrs. Total)	0	0	2	1
	Total Practical/ Sessional/Mandatory Course			0	0	9	4
	Total of Fifth Semester			15	3	9	18



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Sixth Semester (Third Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	PC	PC-ME601	Manufacturing Technology	4	0	0	4
2	PC	PC-ME602	Design of Machine Elements	3	1	0	4
3	PE	PE-ME601	Elective-I	3	0	0	3
4	PE	PE-ME602	Elective-II	3	0	0	3
5	HM	HM-HU601	Humanities II (Operations Research)	4	0	0	4
6	MC	MC671	Aptitude Skill Development-II	2	0	0	0
7	MC	MC672	Constitution of India	2	-	-	0
	Total Theory			21	1	0	18
Practical/ Sessional							
1	PC	PC-ME691	Strength of Materials and Dynamics Lab	0	0	3	1.5
2	PW	PW-ME681	Project-II (90 hrs. Total)	0	0	4	2
3	HM	HM-HU691	Soft skill Development Lab	0	0	2	1
	Total Practical/ Sessional/Mandatory Course			0	0	9	4.5
	Total of Sixth Semester			21	1	9	22.5



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Seventh Semester (Fourth Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	PC	PC-ME701	Advanced Manufacturing Technology	3	0	0	3
2	PE	PE-ME701	Elective III	3	0	0	3
3	PE	PE-ME702	Elective-IV	3	0	0	3
4	OE	OE-ME 701	Open Elective- I	3	0	0	3
5	HM	HM-HU701	Economics for Engineers	3	0	0	3
	Total Theory			15	0	0	15
Practical/ Sessional							
1	PC	PC-ME791	Mechanical Engineering Laboratory III (Manufacturing)	0	0	3	1.5
2	PW	PW-ME781	Project-III	0	0	6	3
	Total Practical/ Sessional/Mandatory Course			0	0	9	4.5
	Total of Seventh Semester			15	0	9	19.5



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Eighth Semester (Fourth Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
Theory							
1	PE	PE-ME801	Elective V	3	0	0	3
2	PE	PE-ME802	Elective VI	3	0	0	3
3	OE	OE-ME 801	Open Elective-II	3	0	0	3
4	OE	OE-ME 802	Open Elective- III	3	0	0	3
	Total Theory			12	0	0	12
Practical/ Sessional							
1	PW	PW-ME881	Project-IV	0	0	10	5
2	PW	PW-ME882	Comprehensive viva-voce	0	0	0	1.5
	Total Practical/ Sessional/Mandatory Course			0	0	10	6.5
	Total of Eighth Semester			12	0	10	18.5
Total Credit							160



## List of Professional Electives

There are six Professional Elective Course Papers in Semester VI, VII and VIII as follows:

(Elective-I) PE-ME601, (Elective-II) PE-ME602, (Elective-III) PE-ME701, (Elective-IV) PE-ME702, (Elective-V) PE-ME801 and (Elective VI) PE-ME802.

Students are to choose one paper for each of the Professional Elective Courses specified in the curriculum structure of a Semester from the following list of Professional Elective Papers. Selection of a paper should be non-repetitive. If a student chooses the paper, **Internal Combustion Engines and Gas Turbines (Code: A)** as a **Professional Elective I in Semester VI**, its paper code will be **PE-ME601A**. Similarly, in case **Mechanical Vibration (Code: A)** is chosen by one in **Semester VIII** as **Professional Elective-V**, its paper Code will be **PE-ME801A**.

PE-ME601	Professional Elective Courses (Elective-I)
PE-ME601A	Internal Combustion Engines and Gas Turbines
PE-ME601B	Composite Materials
PE-ME601C	Mechatronics
PE-ME601D	Process Planning and Cost Estimation

PE-ME602	Professional Elective Courses (Elective-II)
PE-ME602A	Finite Element Methods
PE-ME602B	CAD/CAM
PE-ME602C	Refrigeration and Air Conditioning
PE-ME602D	Cryogenics
PE-ME602E	Advanced Mechanical Design

PE-ME701	Professional Elective Courses (Elective-III)
PE-ME701A	Production and Operations Management
PE-ME701B	Gas Dynamics and Jet Propulsion
PE-ME701C	Machine Learning and Artificial Intelligence
PE-ME701D	Quantity Production Methods

PE-ME702	Professional Elective Courses (Elective-IV)
PE-ME702A	Material Handling
PE-ME702B	Robotics
PE-ME702C	Automobile Engineering
PE-ME702D	Computational Fluid Dynamics

PE-ME801	Professional Elective Courses (Elective-V)
PE-ME801A	Mechanical Vibration
PE-ME801B	Principles of Management
PE-ME801C	Additive Manufacturing

PE-ME802	Professional Elective Courses (Elective-VI)
PE-ME802A	Energy Conservation & Management
PE-ME802B	Micro and Nano Fluidics
PE-ME802C	Product Design and Development

## List of Open Electives

There are three Open Elective Course Papers in Semester VII and VIII as follows:  
(Open Elective-I) OE-ME701, (Open Elective-II) OE-ME801, and (Open Elective-III) OE-ME802.

Students are to choose one paper for each of the Open Elective Courses specified in the curriculum structure of a Semester from the following list of Open Elective Papers. Selection of a paper should be non-repetitive. If a student chooses the paper, **Optimization Techniques in Engineering (Code: A)** as an **Open Elective-I in Semester VII**, its paper code will be **OE-ME701A**. Similarly, in case **Industrial Engineering (Code: A)** is chosen by one in **Semester VIII as Open Elective-II**, its paper Code will be **OE-ME801A**.

OE-ME701	Open Elective Courses (Open Elective-I)
OE-ME701A	Optimization Techniques in Engineering
OE-ME701B	Automation & Control
OE-ME701C	Biomechanics & Biomaterials
OE-ME701D	Quality and Reliability Engineering

OE-ME801	Open Elective Courses (Open Elective-II)
OE-ME801A	Industrial Engineering
OE-ME801B	Power Plant Engineering
OE-ME801C	Internet & Web Technology
OE-ME801D	Green Building Design

OE-ME802	Open Elective Courses (Open Elective-III)
OE-ME802A	Advanced Welding Technology
OE-ME802B	Internet of Things
OE-ME802C	MEMS & Microsystems Technology
OE-ME802D	Micro and Nano Manufacturing