

**COURSE STRUCTURE**  
*for*  
**B.TECH. DEGREE**  
*in*  
**MECHANICAL ENGINEERING**

*(Applicable from the academic session 2024-2025)*

Approved by BOS(ME) dt 5.11.2024 &  
Academic Council, Agenda-01.02, dt 21.11.2024



**Dr. B. C. Roy Engineering College**

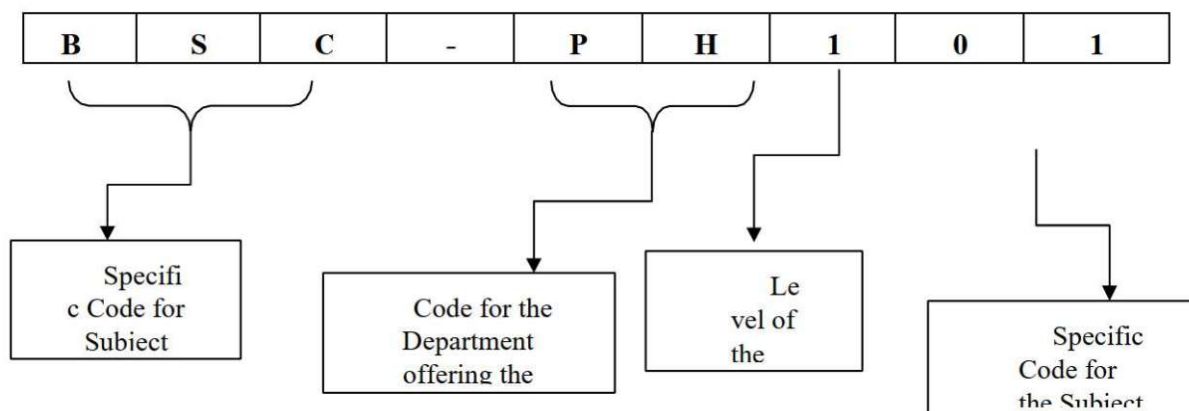
*An Autonomous Institution*

*Approved by: All India Council for Technical Education (AICTE)*

*Affiliated to: Maulana Abul Kalam Azad University of Technology, West Bengal  
(Formerly Known as -WBUT)*

**Jemua Road, Durgapur, West Bengal, India, 713206**

### Subject Numbering Scheme:



### Semester Wise Break Up of Credit (New Autonomous Structure)

Sem1	Sem2	Sem3	Sem4	Sem5	Sem6	Sem7	Sem8	Total
20	22	24	24	24	24	23	14	175

S. No.	Category	Breakup of Credits (Actual) As per Proposed Autonomous Structure
1.	Humanities and Social Sciences including Management courses	10
2.	Basic Science Courses	17
3.	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/ computer etc.	27
4.	Professional core course	66
5.	Professional Elective specialization/branch courses relevant to chosen	9
6.	Indian Knowledge System	0
7.	Multidisciplinary Open Electives Courses	19
8.	Project work, seminar and internship in industry or appropriate work place/ academic and research institutions in India/abroad	27
9.	Mandatory Non Credit Courses – Audit Course	0
<b>Total Credits</b>		<b>175</b>

**B. Tech., 1<sup>st</sup>Yr (1<sup>st</sup> Semester)**

<i>Theory</i>							
Sl No	Paper Name	Paper Code	Marks	L	T	P	Credit
1	Mathematics-I	BSC-M 101	100	3	0	0	3
2	Physics	BSC- PH 101	100	3	0	0	3
3	Basic Electrical Engineering	ESC- EE 101	100	3	0	0	3
4	Engineering Mechanics	ESC-ME 101	100	3	0	0	3
5	English Language and Technical Communication	HS-MC 101	100	3	0	0	3
	<b>Total Theory</b>		<b>500</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>15</b>
<i>Practical</i>							
1	Physics Lab	BSC-PH 191	100	0	0	2	1
2	Basic Electrical Engineering Lab	ESC-EE 191	100	0	0	2	1
3	Language Lab	HS-MC 191	100	0	0	2	1
4	Workshop Practices	ESC-ME 192	100	0	0	4	2
	<b>Total Practical</b>		<b>400</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>5</b>
	<b>Total in 1<sup>st</sup> Semester</b>		<b>900</b>	<b>15</b>	<b>0</b>	<b>10</b>	<b>20</b>
<i>Extra Curricular Activity</i>							
1	NSS	EC-NSS 101	100				0

**B. Tech. 1<sup>st</sup>Yr (2<sup>nd</sup> Semester)**

<i>Theory</i>							
Sl. No.	Paper Name	Paper Code	Marks	L	T	P	Credit
1	Mathematics-II	BSC-M 201	100	3	0	0	3
2	Chemistry	BSC-CH 201	100	3	0	0	3
3	Basic Electronics Engineering	ESC-EC 201	100	3	0	0	3
4	Introduction to Computer Hardware and Software	ESC-CS 201	100	3	0	0	3
5	Programming for Problem Solving	ESC-CS 202	100	3	0	0	3
	<b>Total Theory</b>		<b>500</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>15</b>
<i>Practical</i>							
1	Chemistry Lab	BSC-CH 291	100	0	0	2	1
2	Basic Electronics Engineering Lab	ESC-EC 291	100	0	0	2	1
3	Engineering Graphics	ESC-ME 291	100	0	0	4	2
4	Introduction to Computer Hardware and Software Lab	ESC-CS 291	100	0	0	2	1
5	Programming for Problem Solving Lab	ESC-CS 292	100	0	0	4	2
	<b>Total Practical</b>		<b>500</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>7</b>
	<b>Total of 2<sup>nd</sup> Semester</b>		<b>1000</b>	<b>15</b>	<b>0</b>	<b>14</b>	<b>22</b>
<i>Mandatory Courses</i>							
1	Environmental Science	MC-ES 201		1	0	0	0

**Total Credit in 1<sup>st</sup> Year: 42**

### 2nd Year, 3rd Semester

Sl. No.	Category	Paper Code	Paper Name	L	T	P	Credits
1	Minor	BS ME301	Engineering Mathematics	2	1	0	3
2	Minor	ES ME301	Engineering Materials	3	0	0	3
3	Major	PC ME301	Strength of Materials	2	1	0	3
4	Major	PC ME302	Engineering Thermodynamics	2	1	0	3
5	Major	PC ME303	Manufacturing Process	3	0	0	3
6	Minor	OE ME301	Data Structure and Algorithms	2	0	0	2
Total Credits (Theory)							17
7	Major	PC ME391	Machine Drawing Lab	0	0	4	2
8	Major	PC ME392	Manufacturing Practice Lab	0	0	4	2
9	Major	PC ME393	Strength of Materials & Material Testing Lab	0	0	4	2
10	Minor	OE ME391	Data Structure and Algorithms	0	0	2	1
Total Credits (Practical, Sessional)							7
Total Credits							24

### 2nd Year, 4th Semester

Sl. No.	Category	Paper Code	Paper Name	L	T	P	Credits
1	Major	PC ME401	Mechanisms	2	1	0	3
2	Major	PC ME402	Applied Thermodynamics	2	1	0	3
3	Major	PC ME403	Machining Principles & Machine Tools	2	1	0	3
4	Minor	PC ME404	Metrology & Instrumentation	3	0	0	3
5	Major	PC ME405	Design of Machine Elements	3	0	0	3
6	Minor	OE ME401	Python in Mechanical Engineering	2	0	0	2
7	Value added	MC ME401	Essence of Indian Knowledge	1	0	0	0
Total Credits (Theory)							17
8	Major	PC ME491	Machine Tools Lab	0	0	4	2
9	Minor	PC ME492	Metrology & Instrumentation Lab	0	0	2	1
10	Minor	HU ME491	Corporate Communication & Soft Skills	0	0	2	1
11	Minor	OE ME491	Python in Mechanical Engineering	0	0	2	1
12	Minor	PW ME481	Project-I (Minor)	0	0	4	2
Total Credits (Practical, Sessional)							7
Total Credits							24

**Total Credits in 2<sup>nd</sup> Year : 48**

### 3rd Year, 5th Semester

Sl. No.	Category	Paper Code	Paper Name	L	T	P	Credits
1	Major	PC ME501	Machine Design	2	1	0	3
2	Major	PC ME502	IC Engine & Gas Turbines	3	0	0	3
3	Major	PC ME503	Dynamics of Machines	2	1	0	3
4	Major	PC ME504	Fluid Mechanics & Fluid Machines	3	0	0	3
5	Minor	HU ME501	Operations Research	2	0	0	2
6	Minor	OE ME501	AI and Data Science in Mechanical Engineering	2	0	0	2
Total Credits (Theory)							16
7	Major	PC ME591	Design Practice Lab	0	0	4	2
8	Major	PC ME592	Dynamics of Machines Lab	0	0	2	1
9	Major	PC ME593	Fluid Mechanics & Fluid Machines Lab	0	0	4	2
10	Minor	OE ME591	AI and Data Science in Mechanical Engineering Lab.	0	0	2	1
11	Minor	PW ME581	Project-II (Minor)	0	0	4	2
Total Credits (Practical, Sessional)							8
Total Credits							24

### 3rd Year, 6th Semester

Sl. No.	Category	Paper Code	Paper Name				Credits
1	Major	PC ME601	Heat Transfer	2	1	0	3
2	Major	PC ME602	Power Plant Engineering	3	0	0	3
3	Minor	PC ME603	Mechatronics	3	0	0	3
4	Major	PC ME604	Advanced Manufacturing Technology	3	0	0	3
5	Minor	HU ME601	Production Management	3	0	0	3
6	Minor	OE ME601	DBMS	3	0	0	3
Total Credits (Theory)							18
7	Major	PC ME691	Thermal Engineering Lab	0	0	4	2
8	Minor	PC ME692	Mechatronics Lab	0	0	2	1
9	Minor	OE ME691	DBMS	0	0	2	1
10	Minor	PW ME681	Project -III (Minor)	0	0	4	2
Total Credits (Practical, Sessional)							6
Total Credits							24

**Total Credits in 3<sup>rd</sup> Year : 48**

**4th Year, 7th Semester**

Sl. No.	Category	Paper Code	Paper Name	L	T	P	Credits
1	Minor	PE ME701	Professional Elective-1	3	0	0	3
2	Minor	PE ME702	Professional Elective-2	3	0	0	3
3	Minor	PE ME703	Professional Elective-3	3	0	0	3
4	Minor	OE ME701	Open Elective-1	3	0	0	3
5	Minor	OE ME702	Open Elective-2	3	0	0	3
			Total Credits (Theory)				15
6	Major	PC ME791	Advanced Manufacturing Lab	0	0	2	1
7	Major	PW ME781	Industrial Training and Seminar	0	0	4	2
8	Major	PW ME782	Project-IV (Minor)	0	0	10	5
			Total Credits (Practical, Sessional)				8
			Total Credits				23

**4th Year, 8th Semester**

Sl. No.	Category	Paper Code	Paper Name	L	T	P	Credits
3	Major	PW ME881	Project-V (Major)	0	0	24	12
4	Minor	PW ME882	Comprehensive Viva	0	0	0	2
			Total Credits (Practical, Sessional)				14
			Total Credits				14

**Total Credits in 4<sup>th</sup> Year : 37**

<b>List of Professional Electives for PE ME701/702/703</b>					
	<b>Paper</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
A	Finite Element Analysis	3	0	0	3
B	CAE	3	0	0	3
C	Renewable Energy Engineering	3	0	0	3
D	Computational Fluid Dynamics	3	0	0	3
E	Additive Manufacturing	3	0	0	3
F	Automobile Engineering	3	0	0	3
G	Robotics	3	0	0	3
H	Advanced welding technology	3	0	0	3
I	Selection and Testing of Materials	3	0	0	3

<b>List of Open Electives for OE-ME701/702</b>					
	<b>Paper Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
A	Total Quality Management	3	0	0	3
B	Industrial Pollution and Control	3	0	0	3
C	Energy Conservation and Management	3	0	0	3
D	Waste to Energy- An Overview	3	0	0	3
E	Automation & Control	3	0	0	3
F	Water Resource Engineering	3	0	0	3
G	Machine Learning	3	0	0	3
H	Biology for Engineers	3	0	0	3
I	Industrial Safety	3	0	0	3
J	Corrosion Engineering	3	0	0	3