UG CURRICULUM

(As per Kishore Chatterjee and Deepankar Choudhury Committee's Recommendation, 2022-2023)

Department: Mechanical Engineering

Programme: BTech and Dual Degree

Specialization (if any): BTech (N/A) , Dual Degree: TFE , CADA & CIM

Applicable for: Batch 2022

SUMMARY
(Semester wise credit requirements for a programme)

Semester	Core Courses + Lab	Dept. Electives	HASMED Electives	STEM Electives	Flexible Electives	Project	*Honours courses BTech/DD	Total
1	36 + 3							39
2	36 + 3							39
3	30 + 3							33
4	30 + 6							36
5	24 + 3	0	6				0/ 6	33 + 0/6
6	6 + 12	6	6		6		0/6	36 + 0/6
7	0 + 0	12		12	6	6(BTP-1)	6/6	30 + 12/ 6
8		12			18	12(BTP-2)	0 /6	30 + 12/6
9		12				36(DDP-1)		48
10		12				36(DDP-2)		48
Total	162(C) + 30 (L)	30 (BTech) and +24 (DD)	12	12	30	18 (BTP) and 72 (DDP)	6 (BTech.) / 24 (for DD)	**276* (BTech) + 24 (honors)** + 96 (5th yr) =396 (DD)***

* Total credit requirement for BTech is 276, with a total of 5 department, 5 flexible, 2 HASMED, and 2 STEM electives.

** Pursuing the honors is OPTIONAL for BTech. This requires a student to complete 24 additional credits (over and above 276), which comprises of 18 Project credits (BTP-I of 6 credits, and BTP-II of 12 credits), and a 6-credit elective course (chosen in consultation with BTP supervisor). Whereas, for DD, honors is MANDATORY. Further, for DD, pursuing BTP is NOT an option and honors requirement is 24 credits of elective courses as per the list IIa, IIb, and IIc (page 11) for DD-TFE, DD-CADA, and DD-CIM, respectively.

*** Also, for DD, 24 additional credits of department PG-electives and 72 credits of Dual Degree Project (DDP) are required (beyond 276+24 credits) in the 5th year. The total credit requirement for DD is 396 (276+120).

SEMESTER WISE UG CURRICULUM

Semester -1				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
ME 103	Introduction to STEM as DIC-1 Mechanical Department Introductory Course-I	3-0-0	6	DIC
MA 109	Calculus I	4-0-0	4	C
MA 111	Calculus II	4-0-0	4	C
CH 105	Organic & Inorganic Chemistry	4-0-0	4	C
CH 107	Physical Chemistry	4-0-0	4	C
CH 117	Chemistry Lab	0-0-3	3	C
BB 101	Biology	2-1-0	6	C
MS 101	Makerspace	1-0-6	8	C
NOCS 01#	NCC/NSS/NSO	0-0-0	P/NP	
GC 101	Gender sensitization course	0-0-0	P/NP	
		Total Credits	**39**	

 # Any One of these P/NP courses

Semester -2				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
ME 104	DIC-2, Engineering Mechanics	2-1-0	6	DIC2
MA 106	Linear Algebra	4-0-0	4	C
MA 108	Differential Equations	4-0-0	4	C
PH 111	Introduction to classical physics	4-0-0	4	C
PH 112	Introduction to quantum physics	4-0-0	4	C
PH 117	Physics Lab	0-0-3	3	C
CS 101	Computer Programming	2-1-0	6	C
HSS/IDC/ENT	Introduction to HASMED (HSS+IDC)	2-1-0	4+4	C
NOCS 02#	NCC/NSS/NSO	0-0-0	P/NP	
		Total Credits	**39**	
Honours Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**

 # Any One of these P/NP courses

Semester -3				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
ME 209	Thermodynamics	2-1-0	6	C
EC 101	Economics	2-1-0	6	
ME 223	Solid Mechanics and Strength of Materials	2-1-0	6	C
ME 221	Structural Materials	2-1-0	6	C
HS 250/ES 250	Environmental Studies	2-0-2	6	
ME 218	Solid Mechanics Lab	0-0-3	3	L
		Total Credits	**33**	

Minor Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
ME 223 M	Solid Mechanics and Strength of Materials	2-1-0	6	M
ME 209 M	Thermodynamics	2-1-0	6	M

Semester -4				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
DE 250	Design Thinking	2-1-0	6	
ME 228	Applied Data Science and Machine Learning	2-1-0	6	
ME 219	Fluid Mechanics	2-1-0	6	C
ME 230	Mechanical Processing of Materials	2-1-0	6	C
ME 232	Kinematics and Dynamics of Machines	2-1-0	6	C
ME 213	Manufacturing Practice Lab	0-0-3	3	L
ME 224	Fluid Mechanics Lab	0-0-3	3	L
		Total Credits	36	

Minor Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
ME 230 M	Mechanical Processing of Materials	2-1-0	6	M
ME 219 M	Fluid Mechanics	2-1-0	6	M
ME 232 M	Kinematics and Dynamics of Machines	2-1-0	6	C

Semester -5				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
ME 311	Microprocessor and Automatic Control	2-1-0	6	C
ME 346	Heat Transfer	2-1-0	6	C
ME 306	Applied Thermodynamics	2-1-0	6	C
ME 323	Thermal and Chemical Processing of Materials	2-1-0	6	C
	HASMED Elective 1		6	
ME 374	Manufacturing Process Lab	0-0-3	3	L
		Total Credits	33	
Honours Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
	For Dual Degree students: **Honors Elective 1**[#]	3-0-0	6	O

Minor Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
ME 323 M	Thermal and Chemical Processing of Materials	2-1-0	6	M

[#]*Refer Page 11 for the honors courses for DD*

Semester -6				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
ME 312	Operations Modeling and Analysis	2-1-0	6	C
	Departmental Elective 1	3-0-0	6	D
	HASMED Elective 2		6	
	STEM Elective 1		6	
ME 372	Heat Transfer & Metrology Lab	0-0-3	3	L
ME 318	Machine Design Lab		3	L
ME 310	Microprocessor and Automatic Controls Lab.	0-0-3	3	L
ME 441	Applied Thermodynamics lab	0-0-3	3	L
		Total Credits	36	

Honours Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
	For Dual Degree students: **Honors Elective 2**[#]	3-0-0	6	O

Minor Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**

[#]*Refer Page 11 for the honors courses for DD*

Semester -7				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
	Departmental Elective 2 (DE-2)	3-0-0	6	D
	Equivalent (to BTP1) Elective: **Departmental Elective 3 (DE-3)**		6	D
	STEM Elective 2		6	
	Flexible Elective 1 (FL-1)	3-0-0	6	
	Flexible Elective 2 (FL-2)	3-0-0	6	
		Total Credits	30	
Honours Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
	For **Dual Degree** students: **Honors Elective 3**[#]	3-0-0	6	O
	For **BTech.** Students: **Honors Elective** (one only)		6	O
ME 494	For **BTech**. Students: **BTP-1**		6	O

Minor Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**

[#]*Refer Page 11 for the honors courses for DD*

Semester -8				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
	Equivalent (to BTP2) Elective: Departmental Elective 4 (DE-4)		6	D
	Equivalent (to BTP2) Elective: Departmental Elective 5 (DE-5)		6	D
	Flexible Elective 3 (FL-3)	3-0-0	6	
	Flexible Elective 4 (FL-4)	3-0-0	6	
	Flexible Elective 5 (FL-5)	3-0-0	6	
		Total Credits	30	
Honours Courses				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
	For **Dual Degree** students: **Honors Elective 4**[#]	3-0-0	6	O
ME 496	For **BTech.** Students: **BTP-2**		12	O

[#]*Refer Page 11 for the honors courses for DD*

Semester -9 for DD*				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
	PG Elective – 1	3-0-0	6	C
	PG Elective – 2	3-0-0	6	C
	DDP Stage I		36	C
		Total Credits	**48**	

Semester -10 for DD*				
Course Code	**Course Name**	**L-T-P**	**Credits**	**Tag**
	PG Elective – 3	3-0-0	6	C
	PG Elective – 4	3-0-0	6	C
	DDP Stage II		36	C
		Total Credits	**48**	

*Semesters 9 and 10 only for Dual Degree students.

The above 4 postgraduate (PG) level courses (24 credits), for the various DD specializations are as follows:

1. *TFE specialization:* ME 651, ME 657, ME 661 and ME 663
2. *CADA specialization:* 4 CADA-electives
3. *MFG specialization:* 4 MFG-electives

I. List of Department Core Courses (Please mention course code and course name):

1. ME 103 Mechanical Department Introductory Course-I (DIC-1)
2. ME 104 Engineering Mechanics (DIC2)
3. ME 223 Solid Mechanics and Strength of Materials
4. ME 221 Structural Materials
5 ME 209 Thermodynamics
6. ME 219 Fluid Mechanics
7. ME 230 Mechanical Processing of Materials
8. ME232. Kinematics and Dynamics of Machines
9. ME 311 Microprocessor and Automatic Controls
10. ME 346 Heat Transfer
11. ME 323 Thermal and Chemical Processing of Materials
12. ME 306 Applied thermodynamics
13. ME 312 Operations Modeling and Analysis

IIa. List of Honours (for DD-TFE) Courses (Please mention course code and course name):

1. ME 704 Computational methods in thermal and fluid engineering
2. TFE-Elective 1
3. TFE-Elective 2
4. TFE-Elective 3

IIb. List of Honours (for DD-CADA) Courses (Please mention course code and course name):

1. CADA-Elective 1
2. CADA-Elective 2
3. CADA-Elective 3
4. CADA-Elective 4

IIc. List of Honours (For DD-CIM) Courses (Please mention course code and course name):

1. ME 409 Intelligent Manufacturing Systems Lab
2. CIM-Elective 1
3. CIM -Elective 2
4. CIM -Elective 3

III. List of Minor Courses (Please mention course code and course name): Any 5 of the following courses are required to get a minor in Mechanical Engineering.

1) ME 223M Solid Mechanics and Strength of Materials
2) ME 209M Thermodynamics
3) ME 219M Fluid Mechanics
4) ME 232 M Kinematics and Dynamics of Machines
5) ME 230M Mechanical Processing of Materials
6) ME 338M Thermal and Chemical Processing of Materials