

Haldia Institute of Technology
(An Autonomous Institution Under Maulana Abul Kalam Azad University of Technology, West Bengal)
Syllabus for B. Tech in Mechanical Engineering
(Applicable from the academic session 2026-2027)

Credit Summary for B. Tech. Programme in ME for the batch 2026-2030

Category/ Type of Course		Course Code	Credit Point
Lecture		L	
Tutorial		T	
Practical		P	
Classroom Instruction		CI	
Laboratory Instruction		LI	
Term Work		TW	
Self-Learning		SL	
BSC/ESC	Basic Science Courses	BS	20
	Engineering Courses	ES	18
Program Course	Program Core Course	PC	69
	Program Elective Course	PE	18
Multidisciplinary Course	Open or General Course (OE/GE)	OE	6
Skill Courses	Vocational and Skill Enhancement Course	VSE	15
Multidisciplinary Holistic development- humanities, Social Science and Management + Liberal Learning	Ability Enhancement course (AEC)	HSSM	
	Indian Knowledge System (IKS)		
	Value Education/value Addition/ Professional Ethics/Life skills Courses (VEC/EVLSC)/ Value Added Course (VAC)**		
	Entrepreneurship/ Economics		
	Co-curricular Activities		
Employment Enhancement Courses	Project	EEC	16
	Summer Internship/ Internship		
	Seminar		
Mandatory Courses [Non Credited]		AU	Non credit
Total Credit (Semester/ Program)			162
Honours Course			20

Definition of Credit (as per National Credit Framework 2024): Total notional learning hours = 1200 Hours/ Year, 1 Credit = 30 notional learning hours

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Semester-II

Sr. No.	Course Category	Course Code	Course Title	Teaching & Learning Scheme (in hrs. per Semester)						EXAMSCHEME		
				CI		LI	TW + SL	Total	Total Credits	CA	ESE	TOTAL
				L	T	P						
1	BS	BS-M 201 B/C	Mathematics-II	42	14	0	64	120	4	30	70	100
2	BS	BS-PH 202 B/C	Physics-I	42	0	0	48	90	3	30	70	100
3	BS	BS-PH 292 B/C	Physics-I Lab	0	0	42	03	45	1.5	40	60	100
4	ES	ES-CS 203	Programming for Problem Solving	42	14	0	64	120	4	30	70	100
5	ES	ES-CS 293	Programming Lab	0	0	42	03	45	1.5	40	60	100
6	ES	ES-ME-201	Introduction to Engineering (Department Specific Subject)	42	0	0	48	90	3	30	70	100
7	HSSM	HM-AEC 205	English Language and Technical Communication	28	0	0	32	60	2	30	70	100
8	HSSM	HM-AEC 295	Language Lab	0	0	28	02	30	1	40	60	100
9	HSSM	HM-IKS 206	Values, Ethics and Indian Knowledge System	28	0	0	32	60	2	30	70	100
			Total	224	28	112	296	660	22			

Course Category	Program Course		Programme Course		Multidisciplinary Course	Skill Course	Multidisciplinary Holistic development- humanities, Social Science and Management + Liberal Learning						Employment Enhancement Courses			
	Basic Science (BSC)	Engineering Science (ESC)	Programme Core (PCC)	Programme Elective (PEC)	Open Elective (OEC/MDM)	Vocational and Skill Enhancement Course (VSEC)	Ability enhance Course	Indian Knowledge System	Value Education	Co-curricular	Enterprenurship /Economics/Man agement	Seminar	Mini Project	Major Project	Internship	
Semester Credits	8.5	8.5					3.0	2.0								
Cumulative Sum	17	18				1		5								

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SEMESTER-III

Sr. No.	Course Category	Course Code	Course Title	Teaching & Learning Scheme (in hrs. per semester)						EXAMSCHEME		
				CI		LI	TW+ SL	Total	Total Credits	CA	ESE	TOTAL
				L	T	P						
1	BS	BS-M 302	Mathematics-III	42	0	0	48	90	3	30	70	100
2	PC	PC-ME 304	Strength of Materials	42	0	0	48	90	3	30	70	100
3	PC	PC-ME 305	Manufacturing Processes	42	0	0	48	90	3	30	70	100
4	PC	PC-ME 306	Metrology & Measurement	42	0	0	48	90	3	30	70	100
5	PC	PC-ME 307	Material Science	42	0	0	48	90	3	30	70	100
6	PC	PC-ME 308	Engineering Thermodynamics	42	14	0	64	120	4	30	70	100
7	PC	PC-ME 394	Strength of Materials Lab	0	0	42	03	45	1.5	40	60	100
8	PC	PC-ME 395	Manufacturing Processes Lab	0	0	42	03	45	1.5	40	60	100
9	PC	PC-ME 396	Metrology & Measurement Lab	0	0	42	03	45	1.5	40	60	100
10	PC	PC-ME 397	Machine Drawing Lab using CAD	0	0	42	03	45	1.5	40	60	100
Total hours				252	14	168	316	750	25			

Course Category	Program Course		Programme Course		Multidisciplinary Course	Skill Course	Multidisciplinary Holistic development- humanities, Social Science and Management + Liberal Learning					Employment Enhancement course			
	Basic Science (BS)	Engineering Science (ES)	Programme Core (PC)	Programme Elective (PE)	Open Elective (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Ability enhance Course	Indian Knowledge System	Value Education	Co-curricular	Enterprenurshi p/Economics/ Management	Seminar	Mini Project	Major Project	Internship
Semester Credits	3		22												
Cumulative Sum	20	18	22			1	5								

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SEMESTER-IV

Sr. No.	Course Category	Course Code	Course Title	Teaching & Learning Scheme (in hrs. per semester)						EXAMSCHEME		
				CI		LI	TW+ SL	Total	Total Credits	CA	ESE	TOTAL
				L	T	P						
1	HSSM	HM-ME 402	Principles and Practices of Management	28	0	0	32	60	2	30	70	100
2	PC	PC-ME 406	Fluid Mechanics & Hydraulic Machines	42	14	0	64	120	4	30	70	100
3	PC	PC-ME 407	Machining Principles & Machine Tools	42	0	0	48	90	3	30	70	100
4	PC	PC-ME 408	Heat Transfer	42	0	0	48	90	3	30	70	100
5	PC	PC-ME 409	Design of Machine Elements	42	0	0	48	90	3	30	70	100
6	PC	PC-ME 410	Analysis & synthesis of Mechanisms	42	0	0	48	90	3	30	70	100
7	PC	PC-ME 496	Fluid Mechanics & Hydraulic Machines Lab	0	0	42	03	45	1.5	40	60	100
8	PC	PC-ME 497	Machine Tools Lab	0	0	42	03	45	1.5	40	60	100
9	PC	PC-ME 498	Applied Thermodynamics and Heat Transfer Lab	0	0	42	03	45	1.5	40	60	100
10	VSEC	VSEC-401	Soft Skills for Professional Development - II	0	0	28	32	60	1	-	-	100
Total hours				238	14	154	329	735	23.5			

Course Category	Program Course		Programme Course		Multidisciplinary Course	Skill Course	Multidisciplinary Holistic development- humanities, Social Science and Management + Liberal Learning					Employment Enhancement course			
	Basic Science (BS)	Engineering Science (ES)	Programme Core (PC)	Programme Elective (PE)	Open Elective (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Ability enhance Course	Indian Knowledge System	Value Education	Co-curricular	Enterprenurshi p/Economics/ Management	Seminar	Mini Project	Major Project	Internship
Semester Credits			20.5			1					3				-
Cumulative Sum	20	18	43.5			2					8				

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SEMESTER-V

Sr. No.	Course Category	Course Code	Course Title	Teaching & Learning Scheme (in hrs. per semester)						EXAMSCHEME		
				CI		LI	TW+ SL	Total	Total Credits	CA	ESE	TOTAL
				L	T	P						
1	PC	PC-ME 505	IC Engines	42	0	0	48	90	3	30	70	100
2	PC	PC-ME 506	Modern Manufacturing Processes	42	0	0	48	90	3	30	70	100
3	PC	PC-ME 507	Design of Mechanical Systems	42	0	0	48	90	3	30	70	100
4	PE	PE-ME 502	Professional Elective-I (Course category – 1, Manufacturing, Production & Industrial)	42	0	0	48	90	3	30	70	100
5	PE	PE-ME 503	Professional Elective-II (Course category – 2, Design)	42	0	0	48	90	3	30	70	100
6	PE	PE-ME 504	Professional Elective-III (Course category – 3, Thermal)	42	0	0	48	90	3	30	70	100
7	AU	AU-ME 501	Essence of Constitution of INDIA & Laws in Engineering Practices	28	0	0	02	30	0	0	100	100
8	PC	PC-ME 595	Thermal Engineering Lab	0	0	42	03	45	1.5	40	60	100
9	PC	PC-ME 596	Modern Manufacturing Process Lab	0	0	42	03	45	1.5	40	60	100
10	PC	PC-ME 597	Design Practice Lab	0	0	42	03	45	1.5	40	60	100
			Total hours	280	0	126	299	705	22.5			

Course Category	Program Course		Programme Course		Multidisciplinary Course	Skill Course	Multidisciplinary Holistic development- humanities, Social Science and Management + Liberal Learning					Employment Enhancement course			
	Basic Science (BS)	Engineering Science (ES)	Programme Core (PC)	Programme Elective (PE)	Open Elective (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Ability enhance Course	Indian Knowledge System	Value Education	Co-curricular	Enterprenurshi p/Economics/ Management	Seminar	Mini Project	Major Project	Internship
Semester Credits			13.5	9											
Cumulative Sum	20	18	57	9		2	8								

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SEMESTER-VI

Sr. No.	Course Category	Course Code	Course Title	Teaching & Learning Scheme (in hrs. per semester)						EXAMSCHEME		
				CI		LI	TW+ SL	Total	Total Credits	CA	ESE	TOTAL
				L	T	P						
1	HSSM	HM-ME 601	Production & Operations Management	42	0	0	48	90	3	30	70	100
2	PC	PC-ME 605	Air-conditioning & Refrigeration	42	0	0	48	90	3	30	70	100
3	PC	PC-ME 606	Dynamics of Machines	42	0	0	48	90	3	30	70	100
4	PC	PC-ME 607	Power Plant Engineering.	42	0	0	48	90	3	30	70	100
5	PE	PE-ME 603	Professional Elective-IV (Course category – 1, Manufacturing, Production & Industrial)	42	0	0	48	90	3	30	70	100
6	PE	PE-ME 604	Professional Elective-V (Course category – 3, Thermal)	42	0	0	48	90	3	30	70	100
7	AU	AU-ME 601	Sustainable Development Practices	28	0	0	02	30	0	0	100	100
8	PC	PC-ME 695	Air-conditioning & Refrigeration Lab	0	0	42	03	45	1.5	40	60	100
9	PC	PC-ME 696	Dynamics of Machines Lab	0	0	42	03	45	1.5	40	60	100
10	EEC	EEC-ME 681	Project- I *	0	0	0	90	90	2	0	100	100
Total hours				280	0	84	386	750	23			

* Project- I includes seminar on the project topic's introduction, literature survey, research gap finding, problem formulation and objectives & Idea incubation.

NOTE: Vocational Training/Internship to be conducted after sixth semester and to be evaluated in seventh semester.

Course Category	Program Course		Programme Course		Multidisciplinary Course	Skill Course	Multidisciplinary Holistic development- humanities, Social Science and Management + Liberal Learning					Employment Enhancement course			
	Basic Science (BS)	Engineering Science (ES)	Programme Core (PC)	Programme Elective (PE)	Open Elective (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Ability enhance Course	Indian Knowledge System	Value Education	Co-curricular	Entrepreneurs hip/Economics /Management	Seminar	Mini Project	Major Project	Internship
Semester Credits			12	6							3				3
Cumulative Sum	20	18	69	15		2			11						3

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SEMESTER-VII

Sr. No.	Course Category	Course Code	Course Title	Teaching & Learning Scheme (in hrs. per semester)						EXAMSCHEME		
				CI		LI	TW+ SL	Total	Total Credits	CA	ESE	TOTAL
				L	T	P						
1	HSSM	HM-ME 701	Engineering Economics	28	0	0	32	60	2	30	70	100
2	PE	PE-ME 703	Professional Elective-VI (Course category - 2, Design)	42	0	0	48	90	3	30	70	100
3	EEC	EEC-ME 781	Project – II **	0	0	0	180	180	4	0	100	100
4	EEC	EEC-ME 782	Summer Internship / Vocational Training	0	0	0	135	135	3	0	100	100
			Total hours	70	0	0	395	465	12			

** Project – II include Design of product, experiment, strategy, algorithm, hypothesis, service aid, gadgets and thorough analysis.

	Program Course		Programme Course		Multidisciplinary Course	Skill Course	Multidisciplinary Holistic development- humanities, Social Science and Management + Liberal Learning					Employment Enhancement course			
Course Category	Basic Science (BS)	Engineering Science (ES)	Programme Core (PC)	Programme Elective (PE)	Open Elective (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Ability enhance Course	Indian Knowledge System	Value Education	Co-curricular	Entrepreneurship/Economics/Management	Seminar	Mini Project	Major Project	Internship
Semester Credits				3							2				6
Cumulative Sum	20	18	69	18		2	13					9			

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SEMESTER-VIII

Sr. No.	Course Category	Course Code	Course Title	Teaching & Learning Scheme (in hrs. per semester)						EXAMSCHEME		
				CI		LI	TW+ SL	Total	Total Credits	CA	ESE	TOTAL
				L	T	P						
1	OE	OE-ME 803	Open Elective-I	42	0	0	48	90	3	30	70	100
2	OE	OE-ME 804	Open Elective-II	42	0	0	48	90	3	30	70	100
3	EEC	EEC-ME 881	Project – III ***	0	0	0	270	270	6	0	100	100
4	EEC	EEC-ME 882	Seminar and Viva Voce	0	0	0	135	135	3	0	100	100
			Total hours	84	0	0	501	585	15			

*** Project–III entails upshot of the project (keeping in view of utility, technical feasibility, economic viability, eco-friendliness) and also to divulge conclusion and future scope.

Course Category	Program Course		Programme Course		Multidisciplinary Course	Skill Course	Multidisciplinary Holistic development- humanities, Social Science and Management + Liberal Learning					Employment Enhancement course			
	Basic Science (BS)	Engineering Science (ES)	Programme Core (PC)	Programme Elective (PE)	Open Elective (OE/MDM)	Vocational and Skill Enhancement Course (VSEC)	Ability enhance Course	Indian Knowledge System	Value Education	Co-curricular	Entrepreneurship/Economics/Management	Seminar	Mini Project	Major Project	Internship
Semester Credits					6										- 7
Cumulative Sum	20	18	69	18	6	2	13					16			

Semester	Credit	
1	19	41
2	22	
3	25	48.5
4	23.5	
5	22.5	45.5
6	23	
7	12	27
8	15	
Total	162	

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List of Professional Electives

Maximum two (02) professional electives can be selected from each course category

Course Code	
Course Category - 1 (Manufacturing, Production& Industrial Engineering)	
A	Supply Chain Management
B	Total Quality Management
C	Material Handling Systems
D	Intelligent Manufacturing Systems
E	Additive Manufacturing
F	Quantity Production Methods
G	CAD/CAM
H	Advanced Welding Technology
I	Surface Engineering & Laser Additive Manufacturing
J	Material Characterization
Course Category -2 (Design Engineering)	
K	Engineering Tribology
L	Finite Element Analysis
M	Mechanics of Composite Materials
N	Theory of Elasticity
O	Advanced Solid Mechanics
P	Non-Destructive Testing
Q	Advanced Materials
R	Mechanical Vibration
S	Fracture Mechanics
T	Bio-Mechanics
Course Category - 3 (Thermal Engineering)	
U	Computational Fluid Dynamics
V	Alternative Fuels & Renewable Energy
W	Hydraulic and Pneumatic Control
X	Turbo-machinery
Y	Two-phase Flow and Heat Transfer
Z	Automobile Engineering
AA	Advanced Fluid Mechanics

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List of Open Electives

Course Code	Course Name
A	Enterprise Resource Planning (ERP)
B	Marketing Management
C	Management Information System
D	Smart Manufacturing and Cyber Physical Systems
E	Operations Research
F	Industrial Safety
H	Engineering Optimization
I	Industrial Robotics & Automation
J	Mechatronics
K	Industry 4.0 & 5.0
L	Project Planning and Cost Estimation
M	Drone Technology
N	Fuel Cell Technology
O	Project Management
P	Electrical Vehicle Technology



Department of Mechanical Engineering
Haldia Institute of Technology
[An Autonomous Institute under MAKAUT]
BOS Meeting 15/06/2026

Credit Distribution UG Program in Mechanical Engineering		
Semester	Credit	
1	19	41
2	22	
3	26	48.5
4	24.5	
5	22.5	45.5
6	24	
7	11	27
8	13	
Total	162	

Credit Distribution PG Program in Mechanical Engineering		
Semester	Credit	
1	19	41
2	22	
3	11	27
4	16	
Total	68	

• Prof. Dr. T. K. Jana	Principal, Haldia Institute of Technology, Haldia.	<i>T.K. Jana</i> 16.06.2026
• Prof. Dr. S. Mitra	Professor, Department of Production Engineering, JU, Kolkata.	<i>S. Mitra</i> 16.6.26
• Prof. Dr. S. Bhaumik	Professor, Deptt. of Aerospace Engineering & Applied Mechanics, IEST, Shibpur, Howrah.	<i>S. Bhaumik</i> 16/06/2026
• Prof. Dr. S. Ghosh	Professor, Dept. of Mechanical Engineering, IEST, Shibpur, Howrah.	<i>S. Ghosh</i> 16/06/26
• Mr. Susobhan Patra	Vice President, Haldia Energy Ltd.	<i>Susobhan Patra</i> 16/06/26
• Dr. Venkata Naga Vamsi Munagala	Assistant Professor, Mechanical Engineering Department, IIT Kharagpur.	<i>V. Naga Vamsi Munagala</i> 16/06/26
• Dr. Siddharth Tamang	Assistant Professor, Mechanical Engineering Department, IIT Kharagpur.	<i>Siddharth Tamang</i> 16/06/26
• Prof. Dr. G. K. Bose	Professor & Head, ME Department, HIT, Haldia.	<i>G. K. Bose</i> 16.06.26