



ODISHA UNIVERSITY OF TECHNOLOGY AND RESEARCH

Techno Campus, Mahalaxmi Vihar, Ghatikia, Bhubaneswar-751029.

Syllabus Structure (Effective from 2023-24)

School/ Department: School of Mechanical Sciences

Course: M. Tech., Programme: Thermal Engineering (THE),

Duration: 2 years (Four Semesters)

Abbreviation used:

AC	Audit course	LC	Lab Course	PA	Practical Assessment
PC	Professional Core	PR	Project/ Practical/ Internship	L	Lecture
PE	Professional Elective	SE	Seminar/ Expert Lecture/ Etc.	T	Tutorial
OE	Open Elective	IA*	Internal Assessment	P	Practical
MC	Mandatory/ Common Course	EA	End-Semester Assessment		

*Internal Assessment Mark (30 marks) consists of (i) Mid Semester (20 marks), (ii) Quiz/ Assignment (10 marks)

Subject Code Format:

A1	A2	B3	C4	C5	C6
School/ Dept. (Offering)		Level	0: AC	Serial Number (01 to 99)	
BH: Basic Sciences and Humanities CS: Computer Sciences EE: Electrical Sciences EI: Electronic Sciences IP: Infrastructure and Planning MS: Mechanical Sciences BT: Biotechnology TE: Textile Engineering		1: UG/ Int. Msc. (1 st Year) 2: UG/ Int. Msc. (2 nd Year) 3: UG/ Int. Msc. (3 rd Year) 4: UG/ Int. Msc. (4 th Year) 5: UG/ Int. Msc. (5 th Year) 6: PG (1 st Year) 7: PG (2 nd Year) 8: Ph.D.	1: PC 2: PE 3: OE 4: MC 5: LC 6: PR 7: SE 8: 9:	01/ 03/.../ 19: Odd Sem. (IEM) 21/ 23/.../ 39: Odd Sem. (MML) 41/ 43/.../ 59: Odd Sem. (MSD) 61/ 63/.../ 79: Odd Sem. (THE) 81/ 83/.../ 99: Odd Sem. (MBA) 02/ 04/.../ 20: Even Sem. (IEM) 22/ 24/.../ 40: Even Sem. (MML) 42/ 44/.../ 60: Even Sem. (MSD) 62/ 64/.../ 80: Even Sem. (THE) 82/ 84/.../ 98: Even Sem. (MBA)	

1st Semester

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	PC 1	MS6161	Advanced Fluid Mechanics	3	0	0	3	30	70	-	100
2	PC 2	MS6163	Conduction and Radiation Heat Transfer	3	0	0	3	30	70	-	100
3	PE 1	MS6261	Experimental methods in Thermal Engineering	3	0	0	3	30	70	-	100
		MS6263	Refrigeration Systems								
		MS6265	Design of Thermal systems								
		MS6267	Gas Dynamics								
		MS6269	Power plant practice and control								
MS6271	Heat exchanger analysis and design										
4	MC 1	BS6401	Mathematical Methods in Engineering	3	0	0	3	30	70	-	100
5	MC 2	MS6403	Research Methodology and IPR	2	0	0	2	30	70	-	100
6	LC 1	MS6561	Advanced Thermal Engineering Lab	0	0	4	2	-	-	100	100
7	LC 2	MS6563	Modeling and Simulation Lab	0	0	4	2	-	-	100	100
8	AC 1	BH6001	English for Research Paper Writing	2	0	0	0	30	70	-	100
Total				16	0	10	18	180	420	200	800



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2nd Semester

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	PC 3	MS6162	Advanced Thermodynamics	3	0	0	3	30	70	-	100
2	PC 4	MS6164	Convective heat and Mass Transfer	3	0	0	3	30	70	-	100
3	PE 2	MS6262	Air conditioning and Ventilation	3	0	0	3	30	70	-	100
		MS6264	Gas turbine and jet propulsion								
		MS6266	Theory of combustion and emission								
		MS6268	Bio heat transfer and microfluidics								
4	PE 3	MS6272	Computational Methods in Thermal Engineering	3	0	0	3	30	70	-	100
		MS6274	Computational Fluid Dynamics (ME)								
		MS6276	Turbulent flows								
		MS6278	Two-phase flow								
5	OE 1	Any One from the List of *OE 1 (Appendix-I)		3	0	0	3	30	70	-	100
6	PR 1	MS6662	Project (Specialization Related)	0	0	4	2	-	-	100	100
7	LC 3	MS6562	CFD Lab	0	0	4	2	-	-	100	100
8	AC 2	IP6002	Disaster Management	2	0	0	0	30	70	-	100
Total				17	0	8	19	180	420	200	800

3rd Semester

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	PE 4*	MS7261	Renewable Energy systems	3	0	0	3	30	70	-	100
		MS7263	Nuclear power generation and Safety								
		MS7265	Energy economics and auditing								
		MS7267	Waste heat recovery								
2	PR 2	MS7661	Dissertation (Phase-I)	0	0	24	12	-	-	100	100
Total				3	0	24	15	30	70	100	200

* Virtual/Online Course either offered by OUTR or available in MOOCs platform (No physical class)

4th Semester

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	PR 3	MS7662	Dissertation (Phase-II)	0	0	32	16	-	-	100	100
Total				0	0	32	16	-	-	100	100

Credits and Maximum Marks

Sl. No.	Semester	Credits	Maximum Marks
1	1 st	18	800
2	2 nd	19	800
3	3 rd	15	200
4	4 th	16	100
Total		68	1900



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(APPENDIX-I)

LIST OF (MC/ *OE/ AC) SUBJECTS OFFERED BY SCHOOLS/ DEPARTMENTS

School/ Department (Offering)	Subject Type	Subject Code	Subject Name
Basic Science and Humanities	MC 1	BS6401	Mathematical Methods in Engineering
	*OE 1	BH6302	Spectroscopic Techniques for Organic Compounds
		BH6304	Chemical Biology
		BH6306	Nanoscience and Technology
		BH6308	Statistical Methods
		BH6310	Operations Research
		BH6312	Advanced Numerical Methods
	AC 1	BH6001	English for Research Paper Writing
		BH6003	Sanskrit for Technical Knowledge
		BH6005	Value Education
		BH6007	Constitution of India
	AC 2	BH6002	Pedagogy Studies
BH6004		Stress Management by Yoga	
BH6006		Personality Development through Life Enlightenment Skills	
Computer Sciences	*OE 1	CS6302	Pattern Recognition
		CS6304	Distributed Systems
		CS6306	Microfluidic Biochip
		CS6308	Programming in C
		CS6310	Data Structure
		CS6312	Computer Vision
Electrical Sciences	*OE 1	EE6302	Quantitative Methods for Energy Management and Planning
		EE6304	Soft Computing application to Engineering
		EE6306	Illumination Engineering
		EE6308	AI and ML for Biomedical Sciences
Electronic Sciences	*OE 1	EI6302	Machine Learning and Artificial Intelligence
		EI6304	IoT and its Applications
		EI6306	Parallel Processing
		EI6308	Signal Processing in Mechatronics Systems
		EI6310	Micro Electro Mechanical Systems
Infrastructure and Planning	*OE 1	IP6302	Universally Accessible Built Environments
		IP6304	Environment Impact Analysis
		IP6306	Geotechnics for Waste Materials
		IP6308	Project Planning and Management
	AC 2	IP6002	Disaster Management
Mechanical Sciences	MC 2	MS6403	Research Methodology and IPR
	*OE 1	MS6302	Production Planning and Control
		MS6304	Design of Experiment
		MS6306	Total Quality Management and Six Sigma
		MS6308	Financial Institutions, Instruments and Markets
		MS6310	Renewable Energy Systems
		MS6312	Design of Thermal Systems
		MS6314	Sensors and Actuators in Industry
MS6316	Robot Mechanics and Control		
Biotechnology	*OE 1	BT6302	Nanobiotechnology
Textile Engineering	*OE 1	TE6302	Polymer Composite

*N.B.:

The Open Elective Subjects (*OE 1) are specifically open for all programs of Schools/ Departments, other than the School/ Department offering the same subject.