M.Tech Program from the Department of Mechanical Engineering

M. Tech. in Thermal and Fluids Engineering

Program Learning Objectives:	Program Learning Outcomes:
Program Goal 1: The graduates will acquire advanced knowledge and concepts of Thermal and Fluids Engineering.	**Program Outcome 1**: After completion of the M-Tech in Thermal and Fluids Engineering, the students will be able to manage and solve technical problems associated with thermo-fluid systems.
Program Goal 2: To provide the students an opportunity to upgrade their skills and qualifications.	**Program Outcome 2**: After completion of the M-Tech in Thermal and Fluids Engineering, the students will update their engineering skills for career growth.
Program Goal 3: The graduates will possess the state-of-the art practical, analytical and computational approach for the analysis of thermo-fluid systems.	**Program Outcome 3**: Possess the computational and analytical expertise required for the analysis of thermo-fluid systems with focus in industrial and research applications.

Sl. No.	Subject Code	SEMESTER I	L	T	P	C
1.	HS5111	Technical Writing and Soft Skill	1	2	2	4
2.	ME5101	Advanced Engineering Mathematics	3	1	0	4
3.	ME5105	Advanced Fluid Mechanics	3	0	0	3
4.	ME5106	Gas Dynamics and Propulsion	3	0	0	3
5.	ME5107	Thermo-Fluid Lab-I	0	0	3	1.5
6.	ME61XX	DE-I	3	0	0	3
7.	ME61XX	DE-II	3	0	0	3
8.	XX61PQ	IDE	3	0	0	3
	TOTAL		**19**	**3**	**5**	**24.5**

IDE (Inter Disciplinary electives) in the curriculum aims to create multitasking professionals/ scientists with learning opportunities for students across disciplines/aptitude of their choice by opting level (5 or 6) electives, as appropriate, listed in the approved curriculum.

Sl. No.	Subject Code	SEMESTER II	L	T	P	C
1.	ME5201	Advanced Engineering Software Lab	1	0	4	3

Sl. No.	Subject Code		L	T	P	C
2.	ME5203	Measurement and Instrumentation	3	0	0	3
3.	ME5205	Advanced Heat Transfer	3	1	0	4
4.	ME5206	Thermo-Fluid Lab-II	0	0	3	1.5
5.	MEX2XX	DE-III	3	0	0	3
6.	MEX2XX	DE-IV	3	0	0	3
7.	RM6201	Research Methodology	3	1	0	4
8.	IK6201	IKS	3	0	0	3
	TOTAL		**19**	**2**	**7**	**24.5**

Sl. No.	Subject Code	SEMESTER III	L	T	P	C
1.	ME6198	Summer Internship / Mini Project*	0	0	12	3
2.	ME6199	Project I**	0	0	30	15
	TOTAL		**0**	**0**	**42**	**18**

*Note: Summer Internship (Credit based)

(i) Summer internship (*) period of at least 60 days' (8 weeks) duration begins in the intervening summer vacation between Semester II and III. It may be pursued in industry / R&D / Academic Institutions including IIT Patna. The evaluation would comprise **combined grading based on host supervisor evaluation, project internship report after plagiarism check and seminar presentation at the Department (DAPC to coordinate)** with equal weightage of each of the three components stated herein.

(ii) Further, on return from 60 days internship, students will be evaluated for internship work through combined grading based on host supervisor evaluation, project internship report after plagiarism check, and presentation evaluation by the parent department with equal weightage of each component.

** **Note: M. Tech. Project outside the Institute:** A project-based internship may be permitted in industries/academia (outside IITP) in 3rd or 4th semester in accordance with academic regulations. In the IIIrd Semester, students can opt for a semester long M. Tech. project subject to confirmation from an Institution of repute for research project, on the assigned topic at any external Institution (Industry / R&D lab / Academic Institutions) based on recommendation of the DAPC provided:

(i.) The project topic is well defined in objective, methodology and expected outcome through an abstract and statement of the student pertaining to expertise with the proposed supervisor of the host institution and consent of the faculty member from the concerned department at IIT Patna as joint supervisor.

(ii.) The consent of both the supervisors (external and institutional) on project topic is obtained a priori and forwarded to the academic section through DAPC for approval by the competent authority for office record in the personal file of the candidate.

(iii.) Confidentiality and Non Disclosure Agreement (NDA) between the two organizations with clarity on intellectual property rights (IPR) must be executed prior to initiating the semester long project assignment and committing the same to external organization and vice versa.

(iv.) The evaluation in each semester at Institute would be mandatory and the report from Industry Supervisor will be given due weightage as defined in the Academic Regulation. Further, the final assessment of the project work on completion will be done with equal weightage for assessment of the host and Institute supervisors, project report after **plagiarism check.** The award of grade would comprise **combined assessment based on host supervisor evaluation, project report quality and seminar presentation at the Department (DAPC to coordinate)** with equal weightage of each of the components stated herein.

(v.) In case of poor progress of work and / or no contribution from external supervisor, the student need to revert back to the Institute essentially to fulfill the completion of M. Tech. project as envisaged at the time of project allotment. However, the recommendation of DAPC based on progress report and presentation would be mandatory for a final decision by the competent authority.

Sl. No.	Subject Code	SEMESTER IV	L	T	P	C
1.	ME6299	Project II	0	0	42	21
	TOTAL		**0**	**0**	**42**	**21**

Total Credit from Semester I to IV - 88

ELECTIVE GROUPS

Department Elective - I						
Sl. No.	Subject Code	Subject	L	T	P	C
1.	ME6101	Multiphase Flow & Heat Transfer	3	0	0	3
2.	ME6102	Computational Fluid Dynamics	3	0	0	3

Department Elective - II						
Sl. No.	Subject Code	Subject	L	T	P	C
1.	ME6103	Continuum Mechanics	3	0	0	3
2.	ME6104	Refrigeration and Air-Conditioning	3	0	0	3

Department Elective - III						
Sl. No.	Subject Code	Subject	L	T	P	C
1.	ME6201	Turbulent Shear Flow	3	0	0	3
2.	ME6202	Cryogenics	3	0	0	3
3.	ME6203	Laser Processing of Materials	3	0	0	3

Department Elective - IV						
Sl. No.	Subject Code	Subject	L	T	P	C
1.	ME6204	Aerodynamics	3	0	0	3
2.	ME6205	Advances in IC Engine	3	0	0	3
3.	ME6206	Microfluidics and Microsystems	3	0	0	3

Interdisciplinary Elective (IDE) Course for M. Tech. (Available to students other than ME)

		IDE				
Sl. No.	**Subject Code**	**Subject**	**L**	**T**	**P**	**C**
1.	ME6113	Soft Computing Application in Engineering	3	0	0	3