Master of Technology in
Fluid and Thermal Engineering (FTE)

Programme Level	Post Graduate
Year of Commencement	2021
Minimum Duration	2 Years (4 Semesters)
Maximum Duration	3 Years (6 Semesters)
Senate Reference	30.7

School of Engineering

1. Background:

One of the major thrust areas of our institute is energy. The energy is very broad and multi-discipline; involves many engineering disciplines, material, economics, law and policies etc. as shown in Fig below. The major effort goes in the energy sector in generation of electricity and this process starts with characterization of energy source, transportation of energy and management. Further, it goes in designing of devices, manufacturing and then the electricity generation starts. The involved engineering disciplines in the energy generation process are shown as the pyramid in the energy graphics. Moreover, mechanical engineering has three distinct streams - Fluid and Thermal Engineering, Machine Design and Manufacturing; and contribute to the electricity generation process as the bottom three steps of the energy pyramid.

The current proposal is aimed to develop a strong foundation in fluid and thermal engineering and also contribute to realization of the thrust area of energy of the institute by focusing on the bottom step of the pyramid involving engineering streams.

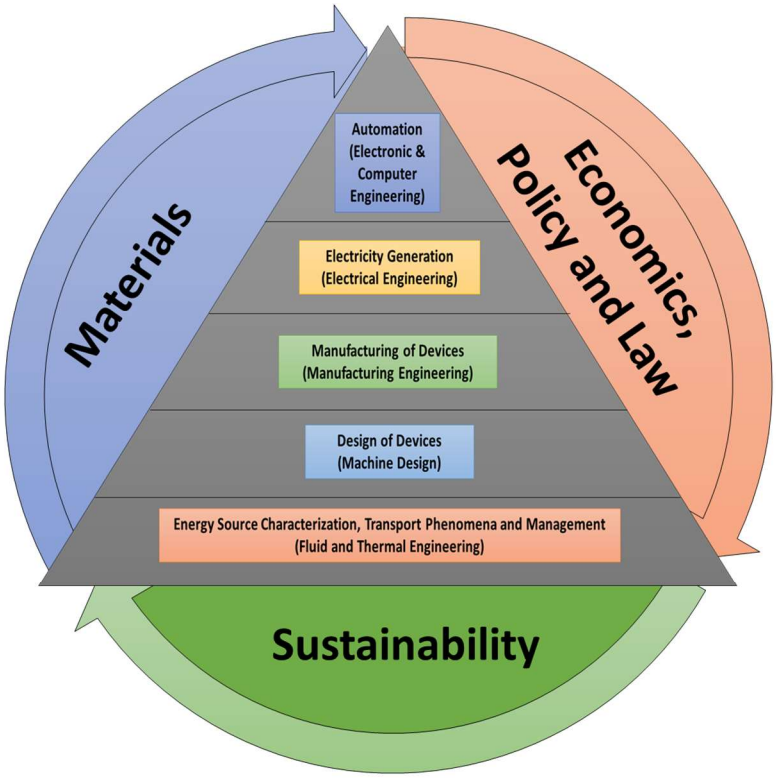

Fig: Different elements of the energy sector and involved academic disciplines.

2. Key features of the Program:

Some of the benefits of proposed M.Tech. in Fluid and Thermal engineering are highlighted below:

1. Provides specialization in the conventional domain of fluid and thermal engineering with emphasis on energy applications.
2. Offers both theoretical and laboratory courses in cohesive manners to enable deeper understanding of thermal engineering.
3. Promotes skill developments in advanced analytical techniques, computational fluid dynamics (CFD) and experimental methods in thermal engineering.
4. Flexible structure of this program enables the students to develop a strong foundation in any energy sectors such as solar, wind, thermal, hydro, geothermal, battery and any other emerging field in future through electives.

3. Program Structure and Details

3.1. Who Should Apply?

The applicant must have a Bachelor's degree in Mechanical or Aerospace or Chemical or related engineering branches along with a valid GATE score (exemption allowed to IIT graduates as per institute norms).

3.2. Annual Intake: As per the need and institute guidelines.

3.3 Program Structure - Total Credit - 70-72 and distribution of these credits are as follows.

Type of Courses	Maximum Credit
Discipline Core courses	16
Discipline Elective Courses	12
Outside Discipline Elective courses/ Open Elective Courses	6
Practicum & Technical Communication	4/5
Thesis	32
Total	70/71

3.4 Semester-wise distribution of courses

3.4.1 First Semester (Credits- 16)

S. No	Subject Type	Subject Code	Subject Name	L-T-P-Cr	Senate Approved Status
1	Core	ME603	Advanced Fluid Mechanics	3-0-0-3	Approved in 2nd senate
2	Core	ME517	Advanced Analytical Techniques for Engineers	3-1-0-4	Prepared
3	Core	ME615	Applied Computational Fluid Dynamics	3-0-0-3	Approved in 3rd senate
4	DE		Discipline Elective -1	3-0-0-3	
5	DE		Discipline Elective -2	3-0-0-3	

3.4.2 Winter Break (Credits -3)

S. No	Subject Type	Subject Code	Subject Name	L-T-P-Cr	Senate Approved Status
1	Practicum	ME501P	Practicum -I	0-0-6-3	Prepared

3.4.3 Second Semester (Credits – 19/20)

S. No	Subject Type	Subject Code	Subject Name	L-T-P-Cr	Senate Approved Status
1	Core	ME616	Convective Heat and Mass Transfer	3-0-0-3	Approved in 9th senate
2	Core	ME604	Experimental Methods in Thermal Engineering	3-0-0-3	Approved in 2nd senate
3	Discipline Elective		Discipline Elective-3	3-0-0-3	
4	Discipline Elective		Discipline Elective-4	3-0-0-3	
5	ODE		Outside Disciple Elective - 1	3-0-0-3	
6	ODE		Outside Disciple Elective - 2	3-0-0-3	
7#	Core	HS541/ ME519	Technical Communication/ Technical Communication for Engineers	1-0-0-1/ 0-2-0-2	Approved/ Prepared

#Students may choose one of the offered Technical Communication courses (ME519 or HS541)

3.4.4 Third Semester (Credits -16)

S. No	Subject Type	Subject Code	Subject Name	L-T-P-Cr	Status
1	Thesis	ME598P	Post Graduate Project-1	16	

3.4.5 Fourth Semester (Credits-16)

S. No	Subject Type	Subject Code	Subject Name	L-T-P-Cr	Status
1	Thesis	ME599P	Post Graduate Project-2	16	

3.5 List of Discipline Electives*:

S. No	Subject Code	Status	Subject Name
1	ME 613	Approved in 9th Senate	Thermal Radiation
2	ME 601	Approved in 2nd Senate	Advanced Finite Element Methods
3	ME 614	Approved in 3rd Senate	Compressible Flow and Gas Dynamics
4	ME 625	Approved in 9th Senate	Introduction to Turbulence and its modelling
5	ME 636	Approved in 10th Senate	Combustion Technology
6	ME518	Prepared	Conduction and Radiation
7	ME504	Approved in 10th Senate	Numerical Methods for Engineering Computation
8	ME605	Approved in 2nd Senate	Airconditioning and Ventilation
9	ME621	Approved in 6th Senate	Aircraft Propulsion
10	ME610	Approved in 2nd Senate	Advanced Thermodynamics
11	ME 505	Approved in 9th Senate	Applied Finite Element Method
12	ME 507	Approved in 9th Senate	Micro and Nanoscale Fluid Mechanics
13	ME513	Approved in 24th Senate	Finite Element Methods in Engineering
14	ME 611	Approved in 2nd Senate	Design and Optimization of Thermal Systems
15	ME 631	Approved in 10th Senate	Heat Transfer and Fluid flow in Energy Systems

*This list will be further updated with the inclusion of new senate approved courses on the recommendation of the program faculty group (PFG).