# **ACADEMIC CURRICULA**

# POST GRADUATE DEGREE PROGRAMMES

**Master of Technology** 

(Choice Based Flexible Credit System)

**Regulations 2021** 

Volume - 21 Curriculum



#### SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)
Kattankulathur, Chengalpattu District 603203,
Tamil Nadu, India



# SRM INSTITUTE OF SCIENCE AND TECHNOLOGY Kattankulathur, Chengalpattu District 603203, Tamil Nadu, India

#### 41 M.Tech in Thermal Engineering

#### 41. (a) Department Vision Statement

#### 41. (b) Department Mission Statement

Stmt - 1	To impart quality education to produce eminent mechanical engineers.
Stmt - 2	To establish Centers of Research Excellence to inculcate research acumen to faculty and students on the emerging thrust areas of mechanical engineering.
Stmt - 3	To inculcate progressive education and intricate facts through cognitive training programs to the faculty and students using state-of-art facilities.

#### 41. (c) Program Education Objectives (PEO)

PEO - 1	Acquire knowledge to attain significant position of leadership in solar energy sector
PEO - 2	Focusing on lifelong learning through advanced research to enhance the performance of Solar energy systems
PEO - 3	Become a consultant for providing solutions for energy problems in energy and environmental sector
PEO - 4	Become a successful entrepreneur in manufacturing or marketing solar energy products for sustainable development
PEO - 5	Lead an ethical life for developing environmentally benign and economically affordable energy products

#### 41. (d) Consistency of PEO's with Mission of the Department

	Mission Stmt 1	Mission Stmt 2	Mission Stmt 3
PEO - 1	3 3	3	3
PEO - 2	3	2 2 2	2
PEO - 3	3	3	3
PEO - 4	3	1	3
PEO - 5	3	2	3

#### 41. (e) PO – Program Outcomes

PO - 1	An ability to independently carry out research /investigation and development work to solve practical problems.
PO - 2	An ability to write and present a substantial technical report/document.
PO - 3	Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The
FO-3	mastery should be at a level higher than the requirements in the appropriate bachelor program.

## 41. (f) Consistency of PEO's with Program Outcomes (PO)

7	Program Outcomes (PO)						
	1	2	3				
PEO - 1	3	3	3				
PEO - 2	3	3	3				
PEO - 3	2	3	2				
PEO - 4	2	1	1				
PEO - 5	3	3	2				

<sup>3 –</sup> High Correlation, 2 – Medium Correlation, 1 – Low Correlation

#### 41. (g) Programme Structure: M.Tech Thermal Engineering

Course	Professional Core Courses (C)				Professional Elective Courses (E)						
	Course	-	Hou Wee	ek		Specialization: Electronic Cooling/ Computational Fluid					
Code	Title	L	T	P	С		Dynamics				
21MAC501T	Computational Methods	3	1			Course	Course		our		
21MEC541J	Advanced Fluid Dynamics	3	0					V	/ee		
21MEC542J	Advanced Heat Transfer	3	0			Code	Title	L	Τ	Р	С
21MEC543J	Computational Fluid Dynamics	3	0			21MEE542T	Transport in Porous Media	3	0	0	_
21MEC541T	Materials for Heat Transfer	3	0			21MEE544J	Compressible and Incompressible	2	0	2	3
21IPC501J <sup>2</sup>	Research Methodology	2	1				Fluid Flows				
21MEC601T 1		3	0	0		21MEE545J	Thermal Design for Electronic	2	0	2	2
	Total Cred	lits			26	21MEE543T	Equipment Radiative Heat Transfer	3	0	0	3
	Project Work, Internship In					Z IIVIEE 343 I			U	U	
In	dustry / Higher Technical Institution	1s (P)				21MEE544T	Micro and Nano scale Heat Transfer and Fluid Flow	3	0	0	3
Course	Course	Н	lour	s/		21MEE545T	Introduction to Turbulence	3	0	0	J
		V	Vee				Heat Transfer in Electronic				
Code	Title	L	Τ	Р	_	21MEE546J	Systems	2	0	2	
21MEP501L S	Specialization Project (OR)	0	0	40	20	21MEE547J	High Performance Computing in	2	0	2	3
21MEP502L S	Specialization Project	0	0	30	15		CFD Power Electronics Design				
	omain Internship Total Credi	0	0	10		21MEE546T	Fundamentals	3	0	0	3
		ເວ			20	21MEE633J	Measurement Techniques in	2	0	2	J
	Open Elective Course (O)						Energy Systems				
							Introduction to Multiphase Flows	3	0	0	_
Course	Course			urs/		11	Convection and Two-Phase Flow	3	0	0	3
				eek			Journal Publication	0	0	0	
Code	Title			T F	_		Design of Heat Exchangers	2	0	2	3
	Industrial Safety			0 (		21MEE549T	CFD of Turbomachinery	3	0	0	
	Entrepreneurship and IPR		3 (		_		Total Credits	i	_		21
	Operations Research			0 (			Professional Elective Courses				
	Human Body Mechanics Energy Storage Systems			0 (			(E)				
ZTIVIEO3031	Total Cr		3   0		3		Specialization: Gas Dynamics/				
							Renewable Energy	١		, 1	
Δ	ssessment by Open Book Examinat	ion (²)				Course			our		
Α.				_		Course	Course		$l \sim \sim$	<b>1</b> /	_
Course	Course			urs/					/ee ⊤		(:
Course			We	ek		Code	Title	L	Τ	Р	С
Course Code	Title			ek	) C		Title  Modelling and Analysis of Energy				3
Course Code	Title  Modelling and Analysis of Energy	L	We	ek F		Code 21MEE536J <sup>2</sup>	Title  Modelling and Analysis of Energy Systems	2 V L	Τ	Р	
Course Code 21MEE536J <sup>2</sup>	Title Modelling and Analysis of Energy Systems	1	We 1	eek	3	Code 21MEE536J <sup>2</sup> 21MEE550T	Title  Modelling and Analysis of Energy Systems  Combustion Technology	2 3	T 0	P 2	
Course Code 21MEE536J <sup>2</sup>	Title Modelling and Analysis of Energy Systems Research Methodology	1 2	We	eek	3	Code 21MEE536J <sup>2</sup> 21MEE550T 21MEE551T	Title  Modelling and Analysis of Energy Systems	2 3 3	T 0 0 0 0	P 2 0 0	
Course Code 21MEE536J <sup>2</sup>	Title Modelling and Analysis of Energy Systems	1 2 2 2 3)	We _ T	eek F P D 2	3	Code 21MEE536J <sup>2</sup> 21MEE550T	Title Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics	2 3 3	T 0	P 2 0	3
Course Code 21MEE536J <sup>2</sup>	Title Modelling and Analysis of Energy Systems Research Methodology	2 2 2 3 Ho	We _ T	eek F P D 2	3	Code 21MEE536J <sup>2</sup> 21MEE550T 21MEE551T	Title  Modelling and Analysis of Energy Systems  Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems	2 3 3	T 0 0 0 0	P 2 0 0	3
Course Code 21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course	Title  Modelling and Analysis of Energy Systems Research Methodology  Course Delivery by online mode (	2 2 2 3) Ho We	We To The Week	eek F P D 2	3 4	Code  21MEE536J <sup>2</sup> 21MEE550T  21MEE551T  21MEE552T  21MEE553T	Title  Modelling and Analysis of Energy Systems  Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine	2 3 3 3	T 0 0 0	P 2 0 0 0	3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code	Title  Modelling and Analysis of Energy Systems Research Methodology  Course Delivery by online mode (  Course  Title	2 2 3) Ho We	We T F	eek P	2 3 2 4 C	Code 21MEE536J <sup>2</sup> 21MEE550T 21MEE551T 21MEE552T	Title  Modelling and Analysis of Energy Systems  Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion	2 3 3 3	T 0 0 0	P 2 0 0 0	3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup>	Title  Modelling and Analysis of Energy Systems Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage	2 2 3) Ho We L 3	We T F	eek F P D 2	3 4	Code  21MEE536J <sup>2</sup> 21MEE550T  21MEE551T  21MEE552T  21MEE553T	Title  Modelling and Analysis of Energy Systems  Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for	2 3 3 3 3	T 0 0 0	P 2 0 0 0 0 0 0 0 0	3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup>	Title  Modelling and Analysis of Energy Systems Research Methodology  Course Delivery by online mode (  Course  Title	2 2 3) Ho We L 3	We T F	eek P	2 3 2 4 C	Code  21MEE536J <sup>2</sup> 21MEE550T  21MEE551T  21MEE552T  21MEE553T  21MEE554T  21MEE554T	Title  Modelling and Analysis of Energy Systems  Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems	2 3 3 3 3 2	T 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 0 0 2	3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup>	Title  Modelling and Analysis of Energy Systems Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage  100% assessment by the Department	2 2 3) Ho We L 3	We   T   T   T   T   T   T   T   T   T	P P P P P P P P P P P P P P P P P P P	2 3 2 4 C	Code 21MEE536J <sup>2</sup> 21MEE550T 21MEE551T 21MEE552T 21MEE553T 21MEE554T 21MEE554T 21MEE5545T	Title  Modelling and Analysis of Energy Systems  Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines	2 3 3 3 3 2 3	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 0 2 0 0	3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup>	Title  Modelling and Analysis of Energy Systems Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage	2 2 3) Ho We L 3	We T T F O (	Per le la companya de	2 3 2 4 C	Code  21MEE536J <sup>2</sup> 21MEE550T  21MEE551T  21MEE552T  21MEE553T  21MEE554T  21MEE554T	Title  Modelling and Analysis of Energy Systems  Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology	2 3 3 3 3 2	T 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 0 0 2	3 3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup>	Title  Modelling and Analysis of Energy Systems Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage  100% assessment by the Department	2 2 3) Ho We L 3	We T T F O (	P P P P P P P P P P P P P P P P P P P	C 3	Code 21MEE536J <sup>2</sup> 21MEE550T 21MEE551T 21MEE552T 21MEE553T 21MEE554T 21MEE554T 21MEE5545T	Title  Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology Compressible and Incompressible	2 3 3 3 3 2 3	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 0 2 0 0	3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup> Course Code 21MEC601T <sup>1</sup>	Title  Modelling and Analysis of Energy Systems  Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage  100% assessment by the Department  Course  Title  Case Studies	1 Ho We L 3 Int (1)	We T P P P P P P P P P P P P P P P P P P	urs/	C 3 C C 3 C C 3	Code  21MEE536J <sup>2</sup> 21MEE550T  21MEE551T  21MEE552T  21MEE553T  21MEE554T  21MEE554T  21MEE555T  21MEE555T  21MEE550J  21MEE544J	Title  Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology Compressible and Incompressible Fluid Flows	3 3 3 3 2 2 2	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 0 2 0 2 2 2	3 3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup> Course Code 21MEC601T <sup>1</sup>	Title  Modelling and Analysis of Energy Systems  Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage  100% assessment by the Department  Course  Title	1 Ho We L 3 Int (1)	We T T P T T T T T T T T T T T T T T T T	urs/ eek T F 0 (2	C 3	Code  21MEE536J <sup>2</sup> 21MEE550T  21MEE551T  21MEE553T  21MEE554T  21MEE554T  21MEE555T  21MEE555T  21MEE550J  21MEE535T <sup>3</sup>	Title  Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology Compressible and Incompressible Fluid Flows Advanced Energy Storage	3 3 3 3 2 2 2 2	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 2 2 2 0 0	3 3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup> Course Code 21MEC601T <sup>1</sup> 21MEE600T <sup>1</sup>	Title  Modelling and Analysis of Energy Systems  Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage  100% assessment by the Department  Course  Title  Case Studies Journal Publication	L   2   2   2   2   2   2   2   2   2	We T T P T T T T T T T T T T T T T T T T	urs/ eek T F 0 (2	C 3 C C 3 C C 3	Code  21MEE536J <sup>2</sup> 21MEE550T  21MEE551T  21MEE553T  21MEE554T  21MEE554T  21MEE555T  21MEE555T  21MEE555T  21MEE535T  21MEE535T  31MEE536T	Title  Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology Compressible and Incompressible Fluid Flows Advanced Energy Storage Flow and Thermal Instabilities	2 3 3 3 3 2 2 2 2 3 3	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 2 2 2 0 0 0 0	3 3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup> Course Code 21MEC601T <sup>1</sup> 21MEE600T <sup>1</sup> All elective course	Title  Modelling and Analysis of Energy Systems  Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage  100% assessment by the Department  Course  Title  Case Studies Journal Publication  rses may be studied under MOOC plate	L   2   2   2   2   2   2   2   2   2	We T T P T T T T T T T T T T T T T T T T	urs/ eek T F 0 (2	C 3 C C 3 C C 3	Code  21MEE536J <sup>2</sup> 21MEE550T 21MEE551T 21MEE552T 21MEE554T 21MEE554T 21MEE555T 21MEE555T 21MEE555T 21MEE555T 21MEE550J 21MEE535T <sup>3</sup> 21MEE536T 21MEE536T 21MEE500T <sup>1</sup>	Title  Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology Compressible and Incompressible Fluid Flows Advanced Energy Storage Flow and Thermal Instabilities Journal Publication	3 3 3 3 2 2 2 2 3 3 0	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 2 2 2 0 0 0 0 0 0	3 3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup> Course Code 21MEC601T <sup>1</sup> 21MEE600T <sup>1</sup> All elective coul 1 100% assessi	Title  Modelling and Analysis of Energy Systems  Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage  100% assessment by the Department  Course  Title  Case Studies Journal Publication  reses may be studied under MOOC platement by the Department	L   2   2   2   2   2   2   2   2   2	We T T P T T T T T T T T T T T T T T T T	urs/ eek T F 0 (2	C 3 C C 3 C C 3	Code  21MEE536J <sup>2</sup> 21MEE550T  21MEE551T  21MEE553T  21MEE554T  21MEE554T  21MEE555T  21MEE555T  21MEE555T  21MEE535T  21MEE535T  31MEE536T	Title  Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology Compressible and Incompressible Fluid Flows Advanced Energy Storage Flow and Thermal Instabilities Journal Publication Power Electronics for Renewable	2 3 3 3 3 2 2 2 2 3 3	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 2 2 2 0 0 0 0	3 3 3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup> Course Code 21MEC601T <sup>1</sup> 21MEE600T <sup>1</sup> All elective courling assessing Assessment by	Title  Modelling and Analysis of Energy Systems  Research Methodology  Course Delivery by online mode (  Course Title Advanced Energy Storage  100% assessment by the Department  Course Title Case Studies Journal Publication  reses may be studied under MOOC platement by the Department by Open Book Examination	L   2   2   2   2   2   2   2   2   2	We T T P T T T T T T T T T T T T T T T T	urs/ eek T F 0 (2	C 3 C C 3 C C 3	Code  21MEE536J <sup>2</sup> 21MEE550T 21MEE551T 21MEE552T 21MEE554T 21MEE554T 21MEE555T 21MEE555T 21MEE555T 21MEE555T 21MEE535T <sup>3</sup> 21MEE536T 21MEE536T 21MEE556T 21MEE556T	Title  Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology Compressible and Incompressible Fluid Flows Advanced Energy Storage Flow and Thermal Instabilities Journal Publication Power Electronics for Renewable Energy Systems	3 3 3 3 2 2 2 3 0 3	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 2 2 0 0 0 0 0 0 0 0 0 0 0 0	3 3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup> Course Code 21MEC601T <sup>1</sup> 21MEE600T <sup>1</sup> All elective courling assessing Assessment by	Title  Modelling and Analysis of Energy Systems  Research Methodology  Course Delivery by online mode (  Course  Title  Advanced Energy Storage  100% assessment by the Department  Course  Title  Case Studies Journal Publication  reses may be studied under MOOC platement by the Department	L   2   2   2   2   2   2   2   2   2	We T T P T T T T T T T T T T T T T T T T	urs/ eek T F 0 (2	C 3 C C 3 C C 3	Code  21MEE536J <sup>2</sup> 21MEE550T 21MEE551T 21MEE552T 21MEE554T 21MEE554T 21MEE555T 21MEE555T 21MEE555T 21MEE555T 21MEE550J 21MEE535T <sup>3</sup> 21MEE536T 21MEE536T 21MEE500T <sup>1</sup>	Title  Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology Compressible and Incompressible Fluid Flows Advanced Energy Storage Flow and Thermal Instabilities Journal Publication Power Electronics for Renewable Energy Systems CFD and its Applications to	3 3 3 3 2 2 2 2 3 3 0	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 0 2 2 2 0 0 0 0 0 0	3 3 3 3
Course Code  21MEE536J <sup>2</sup> 21IPC501J <sup>2</sup> Course Code 21MEE535T <sup>3</sup> Course Code 21MEC601T <sup>1</sup> 21MEE600T <sup>1</sup> All elective courling assessing Assessment by	Title  Modelling and Analysis of Energy Systems  Research Methodology  Course Delivery by online mode (  Course Title Advanced Energy Storage  100% assessment by the Department  Course Title Case Studies Journal Publication  reses may be studied under MOOC platement by the Department by Open Book Examination	L   2   2   2   2   2   2   2   2   2	We T T P T T T T T T T T T T T T T T T T	urs/ eek T F 0 (2	C 3 C C 3 C C 3	Code  21MEE536J <sup>2</sup> 21MEE550T 21MEE551T 21MEE552T 21MEE554T 21MEE554T 21MEE555T 21MEE555T 21MEE555T 21MEE555T 21MEE535T <sup>3</sup> 21MEE536T 21MEE536T 21MEE556T 21MEE556T	Title  Modelling and Analysis of Energy Systems Combustion Technology Hydrogen and Fuel Cells Hypersonic and High Temperature Gas Dynamics Wind Energy Systems Elements of Gas Turbine Propulsion Computational Fluid Dynamics for Energy Systems Design of Turbomachines Solar Energy Technology Compressible and Incompressible Fluid Flows Advanced Energy Storage Flow and Thermal Instabilities Journal Publication Power Electronics for Renewable Energy Systems	U L 2 3 3 3 3 2 2 3 3 2 2 3 3 3 2 2 2 3 3 2 2	T 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	P 2 0 0 0 0 2 2 0 0 0 0 0 0 0 2 2 2 2 0 0 0 0 0 2 2 2 2 0	3 3 3 3

# 41. (h) Implementation Plan: M.Tech Thermal Engineering (Specialization: Electronic Cooling/ Computational Fluid Dynamics)

	Semester - I						Semester - II					
Code	Course Title	Hours/ Week		Code	Code Course Title		Hours/ Week					
		L	Τ	Р	С			L	T	Р	С	
	Computational Methods	3	1	0	4	21MEC543J	Computational Fluid Dynamics	3	0	2	4	
	Advanced Fluid Dynamics	3	0	2	4	21MEE545J	Thermal Design for Electronic	2	0	2		
	Materials for Heat Transfer	3	0	0	3		Equipment		Ů	_	3	
	Advanced Heat Transfer	3	0	2	4	21MEE543T	Radiative Heat Transfer	3	0	0		
21IPC501J <sup>2</sup>	Research Methodology	2	1	2	4	21MEE544T	Micro and Nano Scale Heat Transfer	3	0	0		
21MEE542T	Transport in Porous Media	3	0	0		ZTIVILLOTTT	and Fluid Flow	J	U	0 3	3	
21MEE5///	Compressible and Incompressible	2	0	2	3	21MEE545T	Introduction to Turbulence	3	0	0		
ZIVILLU44J	Fluid Flows		U			21MEE546J	21MEE546J Heat Transfer in Electronic Systems		0	2	3	
	Total Credits 22				22	21MEE547J	High Performance Computing in CFD		0	2	J	
	Semester - III					21MEE546T	Power Electronics Design Fundamentals	3	0	0		
Code	Course Title		ours Veel	Κ	•		Massurament Tachniques in Energy	2	0	2	3	
	One of Election	L	1	P	С		Total Credits	;	,		16	
0414555477	Open Elective	3	0	0	3							
21MEE547T		3	0	0	0		Semester - IV			,		
21MEE548T		3	0	0	3				lour			
21MEE600T		0	0	0		Code	Course Title		Nee_			
21MEE548J		2	0	2	3	0.44555044			1	Р	С	
21MEE549T		3	0	0		21MEP501L   Specialization Project		0	0	40	20	
21MEC601T	21MEC601T <sup>1</sup> Case Studies 3 0 0 3 (OR)											
	Total Credits 12					21MEP502L		0	0	-	15	
						21MEP503L		0	0	10	•	
	• Control Selection and					Total Credits					20	

#### 41.(i) Implementation Plan: M.Tech Thermal Engineering (Specialization: Gas Dynamics/ Renewable Energy)

Semester - I						Semester - II					
		H	lours	s/					ours	5/	
Code	Course Title	١	Veel	<		Code	Course Title		Veel	(	1
		L	Τ	Р	С			L	Τ	Ъ	С
21MAC501T	Computational Methods	3	1	0	4	21MEC543J	Computational Fluid Dynamics	3	0	2	4
21MEC541J	Advanced Fluid Dynamics	3	0	2	4	21MEE551T	Hydrogen and Fuel Cells	3	0	0	
21MEC541T	Materials for Heat Transfer	3	0	0	3	21MEE552T	Hypersonic and High Temperature Gas	3	0	0	3
21MEC542J	Advanced Heat Transfer	3	0	2	4	ZIWEESSZI	Dynamics	J	U	U	
21IPC501J <sup>2</sup>	Research Methodology	2	1	2	4	21MEE553T	Wind Energy Systems	3	0	0	3
21MEE536J <sup>2</sup>	Modeling and Analysis of Energy	2	0	2		21MEE554T	Elements of Gas Turbine Propulsion	3	0	0	3
Z TIVIEE 0300 -	Systems	2	U	2	3	2414555401	Computational Fluid Dynamics for	2	^	2	
21MEE550T	Combustion Technology	3	0	0		21MEE549J	Energy Systems	2	0	2	3
	Total Credits				22		Design of Turbomachines	3	0	0	ı
	0 1 111						Solar Energy Technology	2	0	2	
	Semester - III			,		21MEE544J	Compressible and Incompressible	2	0	2	3
0 1	O T:		lours			ZTMEE344J	Fluid Flows	2	U	2	
Code	Course Title	١ ٧	Veel	P	С		Total Credits				16
	Open Elective	3	1	<u>Λ</u>	3						
OAMETERS 3			0	0	3						
	Advanced Energy Storage	3	0	Ť	0						
	Flow and Thermal Instabilities	3	0	0	3		Semester - IV				
21MEE600T <sup>1</sup>	Journal Publication	0	0	0				Н	ours	/	
21MEE557T	Power Electronics for Renewable	3	0	0		Code	Course Title		/eek		
	Energy Systems				3			L		Р	С
21MEE552J	CFD and its Applications to Engine	2	0	2	-	21MFP501I	Specialization Project	0	_	40	20
	Processes	_	•	_		(OR)				,	
21MEC601T <sup>1</sup>	Case Studies	3	0	0	3	21MFP502I	Specialization Project	0	0	30	15
	Total Credits	•			12		Domain Internship	0		10	5
						Z TWEI OOOL	Total Credits	U	J	10	20
" 01 1 1		IEDEOOL L U					40				

<sup>#</sup> Students must register either 21MEP501L or 21MEP502L and 21MEP503L both in fourth semester

# 41. (j) Program Articulation Matrix: M.Tech Thermal Engineering (Specialization: Electronic Cooling/ Computational Fluid Dynamics)

Course Code	Course Name	Prog	ramme Outco	mes
Course Code	Course Name	1	2	3
21MAC501T	Computational Methods	3	3	
21MEC541J	Advanced Fluid Dynamics	3		
21MEC542J	Advanced Heat Transfer	2	2.5	3
21MEC543J	Computational Fluid Dynamics	2.8	2.8	
21MEC541T	Materials for Heat Transfer	2	2	2
21MEE542T	Transport in Porous Media	2	2	2
21MEE544J	Compressible and Incompressible Fluid Flows	2		2
21MEE545J	Thermal Design for Electronic Equipment	2		3
21MEE543T	Radiative Heat Transfer	2		3
21MEE544T	Micro and Nano scale Heat Transfer and Fluid Flow	3	2	
21MEE545T	Introduction to turbulence	3		
21MEE546J	Heat Transfer in Electronic Systems	2.2	2.6	
21MEE547J	High Performance Computing in CFD	1	2.6	3
	Power Electronics Design Fundamentals	2	1	3
21MEE633J	Measurement Techniques in Energy Systems	3	2	1
21MEE547T	Introduction to Multiphase flows	<i>&gt;</i> _1	2	3
21MEE548T	Convection and Two-Phase Flow	3	2	
21MEE6 <mark>00T</mark>	Journal Publication			
	Design of Heat Exchangers	2.6	2.8	
21ME <mark>E54</mark> 9T	CFD of Turbomachinery	3	3	
21IPC501J	Research Methodology	3	2.6	-
	Open Elective			
2 <mark>1ME</mark> C601T	Case Studies		4	
21MEP501L	Specialization Project			
21MEP502L	Specialization Project			
21MEP503L	Domain Internship			0
	Program Average			

#### 41. (k) Program Articulation Matrix: M.Tech Thermal Engineering (Specialization: Gas Dynamics/ Renewable Energy)

Course Code	Course Name	Prog	ramme Outco	mes
Course Code	Course Name	1	2	3
21MEC541J	Advanced Fluid Dynamics	3		
21MEC542J	Advanced Heat Transfer	2	2.5	3
2 <mark>1MEC54</mark> 3J	Computational Fluid Dynamics	2.8	2.8	
21MAC501T	Computational Methods	3	3	
21MEC541T	Materials for Heat Transfer	2	2	2
21MEE536J	Modeling and Analysis of Energy Systems	3	<i>'</i>	
21MEE550T	Combustion Technology	1.6	1	
21MEE <mark>551T</mark>	Hydrogen and Fuel Cells	1.6	_ /_	
21MEE5 <mark>52T</mark>	Hypersonic and High Temperature Gas Dynamics	3	1.8	3
21MEE553T	Wind Energy Systems	3	2	
21MEE554T	Elements of Gas Turbine Propulsion	2	1.6	1
21MEE549J	Computational Fluid Dynamics for Energy Systems	2.8	2.8	
21MEE555T	Desi <mark>gn of Turbomachi</mark> nes	2	2.75	1.25
21MEE550J	Solar En <mark>ergy Technology</mark>	2.8	2	
21MEE544J	Compressible and Incompressible Fluid Flows	2		2
21MEE535T	Advanced Energy Storage	2.4	2	
21MEE556T	Flow and Thermal Instabilities	3		
21MEE600T	Journal Publication			
21MEE557T	Power Electronics for Renewable Energy Systems	2	1	3
21MEE552J	CFD and its Applications to Engine Processes	2.4	2	
21IPC501J	Research Methodology	3	2.6	
	Open Elective			
21MEC601T	Case Studies			
21MEP501L	Specialization Project			
21MEP502L	Specialization Project			
21MEP503L	Domain Internship			
	Program Average			

<sup>3 –</sup> High Correlation, 2 – Medium Correlation, 1 – Low Correlation



## SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

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