ACADEMIC CURRICULA

POST GRADUATE DEGREE PROGRAMMES

Master of Technology

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 21 Curriculum

SRM INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

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Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

40 M.Tech in Solar Energy

40. (a) Department Vision Statement

Stmt - 1	*To enhance learning and research skills in mechanical engineering and allied fields to accomplish crest positions in world-renowned organizations.*

40. (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.*

40. (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*

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

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

40. (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 mastery should be at a level higher than the requirements in the appropriate bachelor program.*

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

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

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

40. (g) Programme Structure: M.Tech Solar Energy

Professional Core Courses (C)

Course Code	Course Title	Hours/ Week L	T	P	C
21MAC501T	Computational Methods	3	1	0	4
21MEC531J	Solar Radiation and Energy Conversion	3	0	2	4
21MEC532J [2]	Fluid Mechanics and Heat Transfer	3	0	2	4
21MEC533J	Solar Thermal Collectors and Applications	2	0	2	3
21MEC534J	Solar Photovoltaic Systems	3	0	2	4
21IPC501J [2]	Research Methodology	2	1	2	4
21MEC601T [1]	Case Studies	3	0	0	3
	Total Credits				**26**

Project Work, Internship In Industry / Higher Technical Institutions (P)

Course Code	Course Title	Hours/ Week L	T	P	C
21MEP501L	Specialization Project	0	0	40	20
	(OR)				
21MEP502L	Specialization Project	0	0	30	15
21MEP503L	Domain Internship	0	0	10	5
	Total Credits				**20**

100% assessment by the Department ([1])

Course Code	Course Title	Hours/ Week L	T	P	C
21MEC601T [1]	Case Studies	3	0	0	3
21MEE600T [1]	Journal Publication	0	0	0	3

Course Delivery by online mode ([3])

Course Code	Course Title	Hours/ Week L	T	P	C
21MEE532T [3]	Electrical Drives and Smart Grid System	3	0	0	3
21MEE535T [3]	Advanced Energy Storage	3	0	0	3
21MEE537T [3]	Energy Forecasting, Modeling and Project Management	3	0	0	3
21MEE632T [3]	Fuzzy logic and Neural Network for Solar Energy Systems	3	0	0	3

Professional Elective Courses (E)

Course Code	Course Title	Hours/ Week L	T	P	C
21MEE531T	Energy Conservation and Management	3	0	0	3
21MEE532T [3]	Electrical Drives and Smart Grid System	3	0	0	
21MEE533T	Solar Refrigeration and Air Conditioning	3	0	0	3
21MEE534T	Solar systems for Buildings	3	0	0	
21MEE505T	Mechanical Behavior of Engineering Materials	3	0	0	3
21MEE535T [3]	Advanced Energy Storage	3	0	0	
21MEE605J [2]	Computational Fluid Dynamics	2	0	2	
21MEE536J [2]	Modelling and Analysis of Energy Systems	2	0	2	3
21MEE537T [3]	Energy Forecasting, Modeling and Project Management	3	0	0	3
21MEE538T	Solar Energy for Industrial Processes and Agriculture	3	0	0	
21MEE631T	Installation and Maintenance of solar systems	3	0	0	3
21MEE632T [3]	Fuzzy logic and Neural Network for Solar Energy Systems	3	0	0	
21MEE600T [1]	Journal Publication	0	0	0	
21MEE633J	Measurement Techniques in Energy Systems	2	0	2	3
21MEE634T	Solar Power Generation Techniques and Policies	3	0	0	
.	**Total Credits**				**21**

Open Elective Course (O)

Course Code	Course Title	Hours/ Week L	T	P	C
21MEO501T	Industrial Safety	3	0	0	3
21MEO502T	Entrepreneurship and IPR	3	0	0	3
21MEO503T	Operations Research	3	0	0	3
21MEO504T	Human Body Mechanics	3	0	0	3
21MEO505T	Energy Storage Systems	3	0	0	3
	Total Credits				**3**

Assessment by Open Book Examination ([2])

Course Code	Course Title	Hours/ Week L	T	P	C
21MEC532J [2]	Fluid Mechanics and Heat Transfer	3	0	2	4
21MEE536J [2]	Modelling and Analysis of Energy Systems	3	0	0	3
21MEE605J [2]	Computational Fluid Dynamics	2	0	2	3
21IPC501J [2]	Research Methodology	2	1	2	4

All elective courses may be studied under MOOC platform

[1] *100% assessment by the Department*

[2] *Assessment by Open Book Examination*

[3] *Course Delivery through online mode*

40. (h) Implementation Plan: M.Tech Solar Energy

Semester - I

Code	Course Title	Hours/ Week			
		L	T	P	C
21MEC531J	Solar Radiation and Energy Conversion	3	0	2	4
21MEC532J [2]	Fluid Mechanics and Heat Transfer	3	0	2	4
21MEC533J	Solar Thermal Collectors and Applications	2	0	2	3
21MAC501T	Computational Methods	3	1	0	4
21IPC501J [2]	Research Methodology	2	1	2	4
21MEE531T	Energy Conservation and Management	3	0	0	3
21MEE532T [3]	Electrical Drives and Smart Grid System	3	0	0	
	Total Credits				**22**

Semester - II

Code	Course Title	Hours/ Week			
		L	T	P	C
21MEC534J	Solar Photovoltaic Systems	3	0	2	4
21MEE533T	Solar Refrigeration and Air Conditioning	3	0	0	3
21MEE534T	Solar Systems for Buildings	3	0	0	
21MEE505T	Mechanical Behavior of Engineering Materials	3	0	0	3
21MEE535T [3]	Advanced Energy Storage	3	0	0	
21MEE605J [2]	Computational Fluid Dynamics	2	0	2	
21MEE536J [2]	Modelling and Analysis of Energy Systems	2	0	2	3
21MEE537T [3]	Energy Forecasting, Modeling and Project Management	3	0	0	3
21MEE538T	Solar Energy for Industrial Processes and Agriculture	3	0	0	
	Total Credits				**16**

Semester - III

Code	Course Title	Hours/ Week			
		L	T	P	C
	Open Elective	3	0	0	3
21MEE631T	Installation and Maintenance of Solar Systems	3	0	0	3
21MEE632T [3]	Fuzzy logic and Neural Network for Solar Energy Systems	3	0	0	
21MEE600T [1]	Journal Publication	0	0	0	
21MEE633J	Measurement Techniques in Energy Systems	2	0	2	3
21MEE634T	Solar Power Generation Techniques and Policies	3	0	0	
21MEC601T [1]	Case Studies	3	0	0	3
	Total Credits				**12**

Semester - IV

Code	Course Title	Hours/ Week			
		L	T	P	C
21MEP501L	Specialization Project (OR)	0	0	40	20
21MEP502L	Specialization Project	0	0	30	15
21MEP503L	Domain Internship	0	0	10	5
	Total Credits				**20**

 # Students must register either 21MEP501L or 21MEP502L and 21MEP503L both in fourth semester

40. (i) Program Articulation Matrix: M.Tech Solar Energy

Course Code	Course Name	Programme Outcomes		
		1	2	3
21MEC531J	*Solar Radiation and Energy Conversion*	*2.8*	*3*	
21MEC532J	*Fluid Mechanics and Heat Transfer*	*2.8*	*2.8*	
21MEC533J	*Solar Thermal Collectors and Applications*	*3*	*2*	
21MAC501T	*Computational Methods*	*3*	*3*	
21MEC534J	*Solar Photovoltaic Systems*	*2*		*2.8*
21MEE531T	*Energy Conservation and Management*	*3*		*3*
21MEE532T	*Electrical Drives and Smart Grid system*	*2*	*2.8*	
21MEE533T	*Solar Refrigeration and Air conditioning*	*3*	*2*	
21MEE534T	*Solar Systems for Buildings*	*2.8*	*2*	
21MEE505T	*Mechanical Behavior of Engineering Materials*	*1.6*	*2*	
21MEE535T	*Advanced Energy Storage*	*2.4*	*2*	
21MEE536J	*Modelling and Analysis of Energy Systems*	*2.8*	*2.8*	
21MEE537T	*Energy Forecasting, Modeling and Project Management*	*3*		
21MEE538T	*Solar Energy for Industrial Processes and Agriculture*	*2.4*	*2*	
21MEE631T	*Installation and Maintenance of Solar Systems*	*3*	*2*	*3*
21MEE632T	*Fuzzy logic and Neural Network for Solar Energy Systems*	*2.8*	*2*	
21MEE600T	*Journal Publication*			
21MEE633J	*Measurement Techniques in Energy Systems*	*3*	*2*	*1*
21MEE634T	*Solar Power Generation Techniques and Policies*	*2.8*	*2*	*2*
21MEE605J	*Computational Fluid Dynamics*	*2.8*	*2.8*	*3*
21IPC501J	*Research Methodology*	*3*	*2.6*	
	Open Elective			
21MEC601T	*Case Studies*			
21MEP501L	*Specialization Project*			
21MEP502L	*Specialization Project*			
21MEP503L	*Domain Internship*			
	Program Average			

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

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