

**PERIYAR
MANIAMMAI**
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University)
Established Under Sec. 3 of UGC Act, 1956 • NAAC Accredited
think • innovate • transform

Criterion 1 – Curricular Aspects

Key Indicator	1.2	Academic Flexibility
Metric	1.2.2	Percentage of Programmes in which Choice Based Credit System (CBCS)/elective course system has been implemented (Data for the latest completed academic year)

DEPARTMENT OF MECHANICAL ENGINEERING STRUCTURE OF THE PROGRAM CLEARLY INDICATING COURSES, CREDITS/ELECTIVES

Programmes

1. B.Tech Mechanical Engineering – Full Time
2. M.Tech Renewable Energy – Full time.

1. B.TECH MECHANICAL ENGINEERING - (FULL TIME)

SEMESTER-WISE STRUCTURE OF CURRICULUM

REGULATION – 2021 Revision II

(Applicable to the students admitted the Academic year 2023-24)

SEMESTER I

S.No.	Course Code	Category	Courses	Credits				Hours			
				L	T	P	Total	L	T	P	Total
1.	XMA101	BSC	Calculus and Linear Algebra	3	1	0	4	3	1	0	4
2.	XCP102	ESC	Programming for Problem Solving	3	0	0	3	3	0	0	3
3.	XAC103	BSC	Applied Chemistry for Engineers	3	1	0	4	3	1	0	4
4.	XEG104	ESC	Engineering Graphics and Design	1	0	2	3	1	0	4	5
5.	XGS105	HSMC	Speech Communication	0	1	2	3	0	1	4	5
6.	XUM106	MC	Constitution of India	0	0	0	0	3	0	0	3
7.	XCP107	ESC	Programming for Problem Solving Laboratory	0	0	1	1	0	0	2	2
8.	XAC108	BSC	Applied Chemistry Laboratory for Engineers	0	0	1	1	0	0	2	2
			Total				19				28

SEMESTER II

S.No.	Course Code	Category	Courses	Credits				Hours			
				L	T	P	Total	L	T	P	Total
1.	XMA201	BSC	Calculus, Ordinary Differential Equations and Complex Variables	3	1	0	4	3	1	0	4
2.	XBE202	ESC	Electrical and Electronic Engineering Systems	3	1	0	4	3	1	0	4
3.	XAP203	BSC	Applied Physics for Engineers	3	1	0	4	3	1	0	4
4.	XGS204	HSMC	Technical Communication	2	0	0	2	2	0	0	2
5.	XWP205	ESC	Workshop Practices	1	0	2	3	1	0	4	5
6.	XEM206	ESC	Engineering Mechanics	3	0	0	3	3	0	0	3
7.	XBE207	ESC	Electrical and Electronic Engineering Systems Laboratory	0	0	1	1	0	0	2	2
8.	XAP208	BSC	Applied Physics for Engineers Laboratory	0	0	1	1	0	0	2	2
			Total				22				26

SEMESTER III

S.No.	Course Code	Category	Courses	Credits				Hours			
				L	T	P	Total	L	T	P	Total
1.	XMA301	BSC	Transforms and Partial Differential Equations	3	0	0	3	3	0	0	3
2.	XME302	PCC	Thermodynamics	3	1	0	4	3	1	0	4
3.	XME303	PCC	Strength of Materials	3	1	0	4	3	1	0	4
4.	XME304	PCC	Materials Engineering	3	0	0	3	3	0	0	3
5.	XME305	PCC	Machine Drawing	1	0	1	2	1	0	2	3
6.	XUM306	HSMC	Entrepreneurship Development	2	0	0	2	2	0	0	2
7.	XUM307	MC (HSMC)	Universal Human Values 2 : Understanding Harmony and gender	3	0	0	3	3	0	0	3
8.	XME308	PCC	Strength of Materials Laboratory	0	0	1	1	0	0	2	2
9.	XME309	PCC	Computer Aided Drafting Laboratory	0	0	1	1	0	0	2	2
10.	XME310	PROJ	In-plant Training - I	-	-	-	1	-	-	-	-
			Total				24				26

SEMESTER IV

S.No.	Course Code	Category	Courses	Credits				Hours			
				L	T	P	Total	L	T	P	Total
1.	XMA401	BSC	Probability Distribution and Statistical Methods	3	0	0	3	3	0	0	3
2.	XME402	PCC	Applied Thermodynamics	3	1	0	4	3	1	0	4
3.	XME403	PCC	Fluid Mechanics and Fluid Machines	3	1	0	4	3	1	0	4
4.	XME404	PCC	Instrumentation and Control	3	0	0	3	3	0	0	3
5.	XUM405	HSMC	Economics for Engineers	3	0	0	3	3	0	0	3
6.	XUM406	MC	Disaster Management	0	0	0	0	3	0	0	3
7.	XME407	PCC	Thermal Engineering Laboratory	0	0	1	1	0	0	2	2
8.	XME408	PCC	Fluid Mechanics and Fluid Machines Laboratory	0	0	1	1	0	0	2	2
			Total				19				24

SEMESTER V

S.No.	Course Code	Category	Courses	Credits				Hours			
				L	T	P	Total	L	T	P	Total
1.	XME501	PCC	Heat Transfer	3	1	0	4	3	1	0	4
2.	XME502	PCC	Solid Mechanics	3	1	0	4	3	1	0	4
3.	XME503	PCC	Manufacturing Processes	3	0	0	3	3	0	0	3
4.	XME504	PCC	Kinematics and Theory of Machines	3	1	0	4	3	1	0	4
5.	XME505	PEC	Professional Elective Course – I	3	0	0	3	3	0	0	3

6.		OE	Open Elective Course – I	3	0	0	3	3	0	0	3
7.	XME507	PCC	Heat Transfer and Refrigeration Laboratory	0	0	1	1	0	0	2	2
8.	XME508	PCC	Kinematics and Theory of Machines Laboratory	0	0	1	1	0	0	2	2
9.	XME509	PROJ	In-plant Training – II	-	-	-	1	-	-	-	-
			Total				24				25

SEMESTER VI

S.No.	Course Code	Category	Courses	Credits				Hours			
				L	T	P	Total	L	T	P	Total
1.	XME601	PCC	Manufacturing Technology	4	0	0	4	4	0	0	4
2.	XME602	PCC	Design of Machine Elements	3	1	0	4	3	1	0	4
3.	XME603	PEC	Professional Elective Courses - II	3	0	0	3	3	0	0	3
4.		OE	Open Elective Courses – II	3	0	0	3	3	0	0	3
5.	XGS605	HSMC	Professional Skills	1	0	2	3	1	0	4	5
6.	XUM606	MC	Cyber Security	0	0	0	0	3	0	0	3
7.	XME607	PCC	Machine Tools and Metrology Laboratory	0	0	1	1	0	0	2	2
8.	XME608	PCC	Tool Design and Drawing Laboratory	0	0	1	1	0	0	2	2
			Total				19				26

SEMESTER VII

S.No.	Course Code	Category	Courses	Credits				Hours			
				L	T	P	Total	L	T	P	Total
1.	XME701	PCC	Automation in Manufacturing	3	0	0	3	3	0	0	3
2.	XME702	PCC	Automobile Engineering and E-Vehicles	3	0	0	3	3	0	0	3
3.	XME703	PEC	Professional Elective Courses - III	3	0	0	3	3	0	0	3
4.		OE	Open Elective Courses – III	3	0	0	3	3	0	0	3
5.	XES705	MC	Environmental Studies	0	0	0	0	3	0	0	3
6.	XME706	PCC	CAD/CAM Laboratory	0	0	1	1	0	0	2	2
7.	XME707	PCC	Fluid Power Control and Mechatronics Laboratory	0	0	1	1	0	0	2	2
8.	XME708	PROJ	Project Work (Phase - I)	0	0	2	2	0	0	4	4
9.	XME709	PROJ	In-plant Training – III	-	-	-	2	-	-	-	-
			Total				18				23

SEMESTER VIII

S.No.	Course Code	Category	Courses	Credits				Hours			
				L	T	P	Total	L	T	P	Total
1.	XME801	PEC	Professional Elective courses - IV	3	0	0	3	3	0	0	3
2.		OE	Open Elective Courses – IV	3	0	0	3	3	0	0	3
3.		OE	Open Elective Courses – V	3	0	0	3	3	0	0	3
4.	XME804	PROJ	Project Work (Phase - II)	0	0	9	9	0	0	18	18
			Total				18				27

OPEN ELECTIVE COURSES

(OFFERED BY MECHANICAL ENGINEERING DEPARTMENT)

CODE. No	Course Title	Credits			
		L	T	P	C
XMEOE1	Product Design and Development	3	0	0	3
XMEOE2	Renewable Energy Sources	3	0	0	3
XMEOE3	Microelectromechanical Systems	3	0	0	3
XMEOE4	Energy Studies	3	0	0	3

PROFESSIONAL ELECTIVE COURSES

TRACK – I (Thermal Stream)

Course Code No	Course Title	Credits			
		L	T	P	C
XMEE01	Gas Dynamics and Shock Waves	3	0	0	3
XMEE02	Computational Fluid Dynamics	3	0	0	3
XMEE03	Refrigeration and Air conditioning	3	0	0	3
XMEE04	Renewable Energy Sources	3	0	0	3
XMEE05	Advanced I.C Engines	3	0	0	3
XMEE06	Power Plant Engineering	3	0	0	3

TRACK – II (Design Stream)

XMEE07	Finite Element Analysis	3	0	0	3
XMEE08	Design of Transmission Systems	3	0	0	3
XMEE09	Mechanical Vibrations	3	0	0	3
XMEE10	Design of Jigs and Fixtures and press tools	3	0	0	3
XMEE11	Computer Aided Design	3	0	0	3
XMEE12	Product Design and Development	3	0	0	3

TRACK – III (Manufacturing Stream)					
XMEE13	Industrial Safety	3	0	0	3
XMEE14	Computer Integrated Manufacturing	3	0	0	3
XMEE15	Composite Materials	3	0	0	3
XMEE16	Reliability Engineering	3	0	0	3
XMEE17	Advanced Welding Technology	3	0	0	3
XMEE18	Process Planning and Cost Estimation	3	0	0	3
TRACK – IV (General Stream)					
XMEE19	Microelectromechanical Systems	3	0	0	3
XMEE20	Industrial Robotics	3	0	0	3
XMEE21	Automotive Electronics	3	0	0	3
XMEE22	Total Quality Management	3	0	0	3
XMEE23	Internet of Things and Smart Manufacturing	3	0	0	3
XMEE24	Mathematical Modeling and Analysis	3	0	0	3
XMEE25	Energy Conservation and Management	3	0	0	3

B.Tech. (Hons). Mechanical Engineering with Specialization in Robotics and Industrial Automation

(Applicable to the students admitted from the Academic year 2023-24 onwards)

S.No.	Course Code	Sem ester	Course Title	Credits				Hours			
				L	T	P	Total	L	T	P	Total
1.	XECHR1	III	Service Robotics with Drives and Sensor	1	0	2	3	1	0	4	5
2.	XECHR2	IV	Industrial Robotics and Automation	1	0	2	3	1	0	4	5
3.	XECHR3	V	Fundamentals of ROS and Embedded in Robotics	1	0	2	3	1	0	4	5
4.	XECHR4	V	Artificial Intelligence and Computer Vision for Robotics	1	0	2	3	1	0	4	5
5.	XECHR5	VI	Deep Learning for Robotics	1	0	2	3	1	0	4	5
6.	XECHR6	VII	Mini Project	0	0	5	5	0	0	10	10
			Total				20				35

2. M.TECH RENEWABLE ENERGY (FULL TIME)

CURRICULUM – FULL TIME

REGULATION– 2022 (Revision I)

(Applicable to the students admitted from the Academic year 2023-24)

SEMESTER I

Category	Code No.	Course Title	L	T	P	C	H
PCC	YRE101	Solar Energy Systems	3	0	0	3	3
PCC	YRE102	Wind, Ocean, Hydro and Geothermal Energy Systems	3	0	0	3	3
PCC	YRE103	Process Modelling in Energy Systems	3	0	0	3	3
PEC		Professional Elective – I	3	0	0	3	3
PEC		Professional Elective – II	3	0	0	3	3
PCC-L	YRE106	Solar Energy Laboratory	0	0	2	2	4
AICTE Mandatory Course*	YRM107	Research Methodology and IPR	2	0	0	2	2
AICTE - Audit**	YEGOE1	English for Research Paper Writing	2	0	0	0	2
PCC-L	YRE109	Process Modelling and Simulation Laboratory	0	0	2	2	4
		Total	19	0	4	21	27

SEMESTER II

Category	Code No.	Course Title	L	T	P	C	H
PCC	YRE201	Bio Energy Systems	3	0	0	3	3
PCC	YRE202	Computational Fluid Dynamics	3	0	0	3	3
PCC	YRE203	Electrical Energy Technology	3	0	0	3	3
PEC		Professional Elective – III	3	0	0	3	3
PEC		Professional Elective – IV	3	0	0	3	3
PCC-L	YRE206	Computational Fluid Dynamics Laboratory	0	0	2	2	4
PCC-L	YRE207	Bio Energy Laboratory	0	0	2	2	4
AICTE - Audit	YPSOE1	Constitution of India	2	0	0	0	2
		Total	17	0	4	19	25

SEMESTER III

Category	Code No.	Course Title	L	T	P	C	H
PROJ	YRE301	Dissertation Phase – I	0	0	10	10	20
PEC		Professional Elective - V	3	0	0	3	3
OEC		Open Elective Course	3	0	0	3	3
Total			6	0	10	16	26

SEMESTER IV

Category	Code No.	Course Title	L	T	P	C	H
PROJ	YRE401	Dissertation Phase – II	0	0	16	16	32
Total			0	0	16	16	32

Total Credits - 72

Legend

PCC – Professional Core Course

PEC- Professional Elective Course

OEC – Open Elective Course

PCC-L – Professional Core Course – Lab

PROJ – Project

* - Mandatory Course

** - Mandatory Course - Audit

Note:

- The credit distribution is followed as per the guidelines given by AICTE/UGC.

Course type	Credits			Hours		
	L	T	P	L	T	P
Lecture course	3	0	0	3	0	3
Practical / Project course	0	0	1	0	0	2

LIST OF PROFESSIONAL CORE ELECTIVES

ELECTIVE GROUP - I:

Code No.	Course Title	L	T	P	C	H
YRE104A	Fluid Dynamics and Heat Transfer	3	0	0	3	3
YRE104B	Energy Conservation in HVAC	3	0	0	3	3
YRE104C	Fuels and Combustion Technology	3	0	0	3	3
YRE104D	Computational Optimization Methods	3	0	0	3	3

ELECTIVE GROUP - II:

Code No.	Course Title	L	T	P	C	H
YRE105A	Environmental Engineering	3	0	0	3	3
YRE105B	Carbon Sequestration and Trading	3	0	0	3	3
YRE105C	Waste Management and Circular Economy	3	0	0	3	3
YRE105D	Energy Storage Systems for E-Vehicles	3	0	0	3	3

ELECTIVE GROUP - III:

Code No.	Course Title	L	T	P	C	H
YRE204A	Optimum Utilization of Heat and Power	3	0	0	3	3
YRE204B	Statistical Tools for Data Analysis	3	0	0	3	3
YRE204C	Sustainable Development	3	0	0	3	3
YRE204D	Hydro Power Technology	3	0	0	3	3

ELECTIVE GROUP - IV:

Code No.	Course Title	L	T	P	C	H
YRE205A	Instrumentation Technology for Energy Systems	3	0	0	3	3
YRE205B	Hydrogen, Fuel cells and Nuclear Energy	3	0	0	3	3
YRE205C	Energy Modelling, Economics and Project Management	3	0	0	3	3
YRE205D	Green Building Technologies	3	0	0	3	3

ELECTIVE GROUP - V:

Code No.	Course Title	L	T	P	C	H
YRE302A	Energy Audit and Management	3	0	0	3	3
YRE302B	Unit Operations in Industries	3	0	0	3	3
YRE302C	CAD/CAM and Simulation of Renewable Energy Systems	3	0	0	3	3
YRE302D	Industrial Safety	3	0	0	3	3

LIST OF OPEN ELECTIVE COURSES

Code No.	Course Title	L	T	P	C	H
YREOE1	Industrial Safety	3	0	0	3	3

MINUTES OF BOARD OF STUDIES

Minutes of the Board of Studies for B.Tech and M.Tech held on 15.06.2023

DEPARTMENT OF MECHANICAL ENGINEERING

BOARD OF STUDIES MEETING

MINUTES OF MEETING

Date: 15.06.2023

Time: 3.00 PM – 04.30 PM


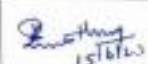
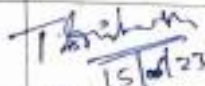
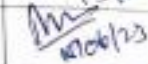
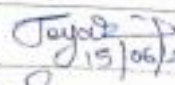
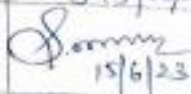
Mode and Venue: Offline / Marie Curie Hall

The Board of Studies meeting was held in offline mode on 15.06.2023 with the following agenda and minutes of the discussion is given below.

Meeting Agenda:

- Revising the syllabus of Engineering Mechanics offered for B.Tech. Programmes. Regulation 2021 Revision II.
- Revising the curriculum for M.Tech. Renewable Energy - Regulation 2022 (Revision I).

Members Present:

S.No.	Name of the Member	Designation	Signature
1.	Dr.P.K. Srividhya	Professor / Mechanical Engineering	
2.	Dr. K. Ramanathan	Professor / Mechanical Engineering, Alagappa Chettiar College of Engineering and Technology, Karaikudi	 15/6/23
3.	Dr. T. Sriharsha	Deputy Manager, Nanotechnology Research and Development, Bharat Heavy Electricals Limited, Trichy.	 15/6/23
4.	Mr. A. Pugazhenti	Assistant Professor (SS) & HOD / Mechanical Engineering.	 15/6/23
5.	Dr. D. Jeyasimman	Professor / Mechanical Engineering	 15/06/23
6.	Dr.S. Buvanewari	HOD / Mathematics	 15/6/23

7.	Dr.V.A. Shanmugavelu	Associate Professor / Civil Engineering	V.A. Shanmugavelu
8.	Dr.J.Kesavan	Assistant Professor (SG) / Mechanical Engineering	J. Kesavan
9.	Mr. S. P. Manikandan	Assistant Professor (SS) / Mechanical Engineering	S. P. Manikandan
10.	Mr.N.Shivakumar	Assistant Professor (SS) / Mechanical Engineering	N. Shivakumar
11.	Mr.P.Srinivasan	Assistant Professor (SS) / Mechanical Engineering	P. Srinivasan
12.	Mr.R.Thiyagarajan	Assistant Professor / Mechanical Engineering	R. Thiyagarajan
13.	Mr.V.Pandiaraj	Assistant Professor (SS) / Mechanical Engineering	V. Pandiaraj

Minutes:

1. The feedback collected from the Teachers were presented and discussed.
2. The Board of Studies has recommended the modified Syllabus for the following courses offered in II Semester for various B.Tech. programmes (Regulation 2021 – Revision II).

COURSE CODE	COURSE TITLE	L	T	P	C	H
XEM206	Engineering Mechanics	3	0	0	3	3
XWP205	Workshop Practices	1	0	2	3	5

- In the modified course of Engineering Mechanics topics on stability of equilibrium, mass moment of inertia of hook and instantaneous centre of rotation are removed in Units III and IV.
 - In the modified course of Workshop Practices, exercises related to sheet metal works are added by replacing exercises related to basic electrical engineering.
3. The Board of Studies has recommended the following new elective courses offered in I Semester for M.Tech. Renewable Energy (Regulation 2022 – Revision I) and their recommended syllabi were finalized.

COURSE CODE	COURSE TITLE	L	T	P	C	H
YRE104D	Computational Optimization Methods	3	0	0	3	3
YRE105D	Energy Storage Systems for E-Vehicles	3	0	0	3	3

4. The Board of Studies has recommended the changes in the syllabus and title of the following courses offered for M.Tech. Renewable Energy under Full Time (Regulation 2022 – Revision I).

COURSE CODE	COURSE TITLE	L	T	P	C	H
YRE102	Wind, Ocean, Hydro and Geothermal Energy Systems (Title in Regulation 2022 Wind, Ocean and Geothermal Energy Systems)	3	0	0	3	3
YRE103	Process Modelling in Energy Systems (Title in Regulation 2022 Process Modelling and Simulation in Energy Systems)	3	0	0	3	3
YRE105C	Waste Management and Circular Economy (Title in Regulation 2022 Waste Management and Energy Recovery)	3	0	0	3	3
YRE205D	Green Building Technologies (Title in Regulation 2022 Energy Efficient Building)	3	0	0	3	3

- In the modified course of Process Modelling in Energy Systems, Units IV and V are revised by including more topics related to Numerical methods, Differential equations and Finite Element Methods.
- In the modified course of Wind, Ocean, Hydro and Geothermal Energy Systems few topics related to Hydro energy are added.
- In the modified course of Waste Management and Circular Economy, Unit V is replaced by topics related to Circular Economy.
- The title of the course YRE205D is changed from Energy Efficient Building into Green Building Technologies without any change in the syllabus.


15/06/23
HOD/Mech.

(A. PUGAZHENTHI)

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