Estd.1995

SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Pulloor, Kariapatti, Virudhunagar (Dist.) - Pin: 626 115.

B.E. MECHANICAL ENGINEERING

REGULATION 2019

Choice Based Credit System

CURRICULUM & SYLLABUS

(After Academic Council Meeting held on 25.09.2021)

Chairperson
Board of Studies
Mechanical Engineering
Sethu Institute of Technology
Kariapatti - 626 115

CHAIRMAN

ACADEMIC COUNCIL

Department Vision statement

- To promote excellence in education and research in mechanical engineering for the benefits of industry and society.

Department Mission Statement

1. To provide quality technical educational experience to enable the graduates to become leaders in their chosen profession.
2. To educate through modern teaching tools and experiential learning to produce proficient engineer.
3. To develop skills in recent technological trends and design software and to facilitate various co-curricular activities to enhance employability and entrepreneurship.
4. To establish collaboration with industries for transfer of technical knowledge.
5. To promote research activities among faculty members and students.
6. To offer beneficial services to the society.

Program Educational Objectives (PEOs)

After few years of graduation our Mechanical Engineering graduates are expected to:	
PEO I (Core Competency)	Develop technical competency to become professionals with expertise in core areas of mechanical engineering.
PEO II (Life Long Learning)	Practice Life Long Learning to solve real time problems and for career development.
PEO III (Professional and Ethical Skills)	Develop professional skills to meet the global standards with ethical and social responsibility.

PROGRAM OUTCOMES (POs):	
1.	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2.	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3.	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4.	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5.	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineeringactivities with an understanding of the limitations.
6.	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilitiesrelevant to the professional engineering practice.
7.	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities andnorms of the engineering practice.
9.	**Individual and team work:** Function effectively as an individual, and as a member orleader in diverse teams, and in multidisciplinary settings.
10.	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11.	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12.	**Life-long learning:** Recognize the need for, and have the preparation and ability to engagein independent and life-long learning in the broadest context of technological change.
PROGRAM SPECIFIC OUTCOMES (PSOs):	
The Mechanical Engineering Graduates will be able to:	
1.	Design, model and analyse mechanical systems and components using computer aidedtechnologies.
2.	Formulate, analyze and provide the solution to thermal engineering related problems withregards to environment and society.
3.	Acquire the profession in industries through the intellectual knowledge of mechanicalengineering and team work.

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Department of Mechanical Engineering

REGULATION 2019

Choice Based Credit System

Sl.No	Category	Credits	R2019 % of Credit Distribution
1.	Humanities and social science	9.5	5.3
2.	Basic Sciences	24.5	13.7
3.	Engineering Science	28.5	15.9
4.	Professional Core	71.5	40.0
5.	Project	15	8.4
6.	Professional Electives	18	10.0
7.	Open Electives	12	6.7
Total		**179**	**100**

S.No	Semester	Credits
1.	Semester - I	23
2.	Semester - II	20.5
3.	Semester - III	24
4.	Semester - IV	23
5.	Semester - V	25
6.	Semester - VI	28.5
7.	Semester - VII	21
8.	Semester - VIII	14
Total Credits		**179**

Employability Courses
Skill Development Courses
Entrepreneurship Development Courses
Any two or all of the above

Semester – I

Sl.No	Course Category	Course Code	Course Name	L	T	P	C	H
THEORY								
1	MC	19UGM131	Induction Programme	0	3	0	P/F	45
2	HS	19UEN101	English for Technical Communication	2	0	0	2	30
3	BS	19UMA102	Engineering Mathematics-I	3	1	0	4	60
4	BS	19UPH103	Engineering Physics	3	0	0	3	45
5	BS	19UCY104	Engineering Chemistry(Mechanical &Chemical Engineering)	3	0	0	3	45
6	ES	19UCS108	Problem Solving and Python Programming	3	0	0	3	45
7	ES	19UME109	Engineering Graphics	3	1	0	4	60
PRACTICAL								
8	ES	19UCS110	Problem Solving and Python Programming Laboratory	0	0	3	1.5	45
9	ES	19UME111	Engineering Practice Laboratory (common to Mech, EEE, Civil,Agri, Chem)	0	0	3	1.5	45
10	BS	19UGS113	Basic Science Laboratory (Mechanical &Chemical Engineering)	0	0	2	1	30
Total Credits : 23				**17**	**5**	**8**	**23**	

Semester – II

Sl.No	Course Category	Course Code	Course Name	L	T	P	C	H
THEORY								
1.	HS	19UEN201	Communication Skills for Professionals	1	1	0	1.5	45
2.	BS	19UMA202	Calculus, Fourier Series and Numerical Methods	3	1	0	4	60
3.	BS	19UPH203	Material Physics (common to Mech & Chemical)	3	0	0	3	45
4.	HS	19UCY204	Environmental Science (common to All branches)	3	0	0	3	45
5.	ES	19UME205	Introduction to Mechanical Engineering	3	0	0	3	45
6.	ES	19UEE226	Basic Electrical and Electronics Engineering (common to MECH, Civil, Chemical &Agri)	3	0	0	3	45
PRACTICAL								
7.	BS	19UGS210	Energy and Environmental Science Laboratory	0	0	2	1.5	45
8.	ES	19UME211	Computer Aided Drafting and Modeling Laboratory	0	0	3	1.5	45
Total Credits : 20.5				**16**	**2**	**6**	**20.5**	

Semester –III

Sl.No	Course Category	Course Code	Course Name	L	T	P	C	H
THEORY								
1.	BS	19UMA321	Probability, Statistics and Partial Differential Equations	3	1	0	4	60
2.	PC	19UME302	Fundamentals of Manufacturing Processes **(INTEGRATED)**	3	0	2	4	75
3.	PC	19UME303	Engineering Thermodynamics	3	1	0	4	60
4.	PC	19UME304	Fluid Mechanics and Machinery **(INTEGRATED)**	3	0	2	4	75
5.	ES	19UME305	Engineering Mechanics	3	1	0	4	60
6.	ES	19UME306	Materials Engineering	3	0	0	3	45
7.	P	19UME307	Seminar	0	0	2	1	30
Total Credits : 24				**18**	**3**	**6**	**24**	

Semester –IV

Sl.No	Course Category	Course Code	Course Name	L	T	P	C	H
THEORY								
1.	PC	19UME401	Theory of Machines	3	1	0	4	60
2.	PC	19UME402	Applied Thermal Engineering	3	1	0	4	60
3.	PC	19UME403	Manufacturing Technology **(INTEGRATED)**	3	0	2	4	75
4.	PC	19UME404	Mechanics of Materials	3	1	0	4	60
5.	PC	19UME405	Automobile Engineering	3	0	0	3	45
6.	BS	19UGS431	Reasoning and Quantitative Aptitude	1	0	0	1	15
7.	MC	19UGM431	Gender Equality	1	0	0	P/F	15
8.	MC	19UGM432	Basics of Biology for Engineers	2	0	0	P/F	30
PRACTICAL								
9.	PC	19UME407	Thermal Engineering Laboratory - I	0	0	3	1.5	45
10.	PC	19UME408	Design Laboratory	0	0	3	1.5	45
Total Credits : 23				**19**	**3**	**8**	**23**	

Semester – V

Sl.No	Course Category	Course Code	Course Name	L	T	P	C	H
THEORY								
1.	PC	19UME501	Heat and Mass Transfer	3	0	0	3	45
2.	PC	19UME502	Design of Machine Elements	3	1	0	4	60
3.	ES	19UME503	Object Oriented Python programming **(INTEGRATED)**	3	0	2	4	75
4.	PC	19UME504	Measurements and Instrumentation **(INTEGRATED)**	3	0	2	4	75
5.	PE	E1	Professional Elective – I	3	0	0	3	45
6.	OE	OE 1	Open Elective – I	3	0	0	3	45
7.	HS	19UGS533	Interpersonal Skills Laboratory	0	0	3	1.5	45
PRACTICAL								
8.	P	19UME507	Creative Thinking & Innovations	0	0	2	1	30
9.	PC	19UME508	Thermal Engineering Laboratory - II	0	0	3	1.5	45
Total Credits : 25				**18**	**1**	**12**	**25**	

Semester – VI

Sl.No	Course Category	Course Code	Course Name	L	T	P	C	H
THEORY								
1.	PC	19UME601	Design of Transmission Systems	3	0	0	3	45
2.	PC	19UME602	Smart Manufacturing	3	0	0	3	45
3.	PC	19UME603	Operations Research	3	1	0	4	60
4.	PC	19UME604	Mechatronics	3	0	0	3	45
5.	PE	E 2	Professional Elective - II	3	0	0	3	45
6.	OE	OE 2	Open Elective - II	3	0	0	3	45
7.	MC	19UGM631	Indian Constitution	1	0	0	P/F	15
PRACTICAL								
8.	P	19UME607	Product Development Project	0	0	8	4	120
9.	PC	19UME608	CAD/ CAM Laboratory	1	0	2	2	60
10.	PC	19UME609	Smart Manufacturing & Mechatronics Laboratory	0	0	4	2	60
11.	HS	19UGS532	Soft Skill and Communications Laboratory	0	0	3	1.5	45
Total Credits : 28.5				**20**	**1**	**17**	**28.5**	

Semester –VII

Sl.No	Course Category	Course Code	Course Name	L	T	P	C	H
THEORY								
1.	PC	19UME701	Project Management and Finance	3	0	0	3	45
2.	PC	19UME702	Finite Element Analysis	3	0	0	3	45
3.	PE	E 3	Professional Elective III	3	0	0	3	45
4.	PE	E 4	Professional Elective – IV	3	0	0	3	45
5.	PE	E 5	Professional Elective – V	3	0	0	3	45
6.	OE	OE 3	Open Elective III	3	0	0	3	45
7.	MC	19UGM731	Professional Ethics & Human values	2	0	0	P/F	30
PRACTICAL								
8.	P	19UME707	Summer Internship	0	0	2	1	30
9.	PC	19UME708	Computational Analysis Laboratory (ANSYS & CFD)	0	0	3	2	60
Total Credits : 21				**20**	**0**	**5**	**21**	

Semester –VIII

Sl.No	Course Category	Course Code	Course Name	L	T	P	C	H
1.	P	19UME801	Project Work	0	0	16	8	240
2.	PE	E6	Professional Elective VI	3	0	0	3	45
3.	OE	OE4	Open Elective IV	3	0	0	3	45
Total Credits : 14				**6**	**0**	**16**	**14**	

PROFESSIONAL ELECTIVE:

Sl. No	Course Category	Course Code	Course Name	L	T	P	C
1.	PE	19UME901	Industrial and Quality Management	3	0	0	3
2.	PE	19UME902	Gas Dynamics and Jet Propulsion	3	0	0	3
3.	PE	19UME903	Applied Hydraulics and pneumatics	3	0	0	3
4.	PE	19UME904	Design of Jigs, Fixtures & Press Tools	3	0	0	3
5.	PE	19UME905	Computational Fluid Dynamics	3	0	0	3
6.	PE	19UME906	Quality Control and Reliability Engineering	3	0	0	3
7.	PE	19UME907	Renewable Sources of Energy	3	0	0	3
8.	PE	19UME908	Industrial Tribology	3	0	0	3
9.	PE	19UME909	Power Plant Technology	3	0	0	3
10.	PE	19UME910	Unconventional Machining Processes	3	0	0	3
11.	PE	19UME911	Composite Materials	3	0	0	3
12.	PE	19UME912	Process Planning and Cost Estimation	3	0	0	3
13.	PE	19UME913	Nano Science and Technology	3	0	0	3
14.	PE	19UME914	Vibration and Noise Control	3	0	0	3
15.	PE	19UME915	Refrigeration and Air conditioning	3	0	0	3
16.	PE	19UME916	Nuclear Engineering	3	0	0	3
17.	PE	19UME917	Entrepreneurship Development	3	0	0	3
18.	PE	19UME918	Maintenance Engineering	3	0	0	3
19.	PE	19UME919	Production Planning and Control	3	0	0	3
20.	PE	19UME920	Design of Heat Exchangers	3	0	0	3
21.	PE	19UME921	Advanced I.C. Engines	3	0	0	3
22.	PE	19UME922	Failure Analysis and Design	3	0	0	3
23.	PE	19UME923	Computer Integrated Manufacturing	3	0	0	3
24.	PE	19UME924	Cryogenics	3	0	0	3
25.	PE	19UME925	Industrial Robotics	3	0	0	3
26.	PE	19UME926	Introduction to aircraft industry and aircraft systems	3	0	0	3
27.	PE	19UME927	Design of aircraft structures	3	0	0	3
28.	PE	19UME928	Non Destructive Testing (NDT)	3	0	0	3
29.	PE	19UME929	Statistical Quality Control (SQC)	3	0	0	3
30.	PE	19UME930	Additive Manufacturing	3	0	0	3
31.	PE	19UME931	Thermal Turbo Machines	3	0	0	3
32.	PE	19UME932	Piping Design	3	0	0	3
33.	PE	19UME933	Machine Learning	3	0	0	3

OPEN ELECTIVE (Mechanical Department offering course):

Sl. No	Course Category	Course Code	Course Name	L	T	P	C
1.	OE	19UME971	Industrial Psychology and Work Ethics	3	0	0	3
2.	OE	19UME972	Industrial Safety and Engineering	3	0	0	3
3.	OE	19UME973	Synthesis of Nano Materials	3	0	0	3
4.	OE	19UME974	Principles of Management	3	0	0	3
5.	OE	19UME975	Total Quality Management	3	0	0	3

INTER/ MULTI DISCIPLINARY ELECTIVE COURSES:

Sl. No	Course Code	Course Name	L	T	P	C
1.	19UGM951	Automation in Agriculture Engineering (Common to Mech, Agri, IT)	3	0	0	3
2.	19UGM952	Electric Vehicles (Common to EEE &Mech)	3	0	0	3
3.	19UGM953	Bio Fluid Mechanics (Common to Biomedical &Mech)	3	0	0	3

ONE CREDIT COURSE:

Sl. No	Course Code	Course Name	L	T	P	C
1.	19UME861	Jigs and Fixtures	1	0	0	1
2.	19UME862	Smart Materials	1	0	0	1
3.	19UME863	Solar energy	1	0	0	1
4.	19UME864	Work Study	1	0	0	1
5.	19UME865	CNC programming	1	0	0	1
6.	19UME866	Limits, Fits and Tolerances	1	0	0	1