DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to Anna University, Chennai)

PERAMBALUR - 621212

REGULATIONS–2023

CHOICE BASED CREDIT SYSTEM

B.E. MECHANICAL ENGINEERING

CURRICULUM & SYLLABI

DEPARTMENT OF MECHANICAL ENGINEERING

(Applicable to students admitted from the Academic year 2023 – 2024 and subsequently under Choice Based Credit System)

Discussed in BOS-4 meeting Dated: 03.10.2024 / Mechanical

Ratified & Approved in Academic Council: 27.02.2025

VISION AND MISSION OF THE INSTITUTION

Vision:

An active and committed centre of advanced learning focused on research and training in the fields of Engineering, Technology and Management to serve the nation better.

Mission:

- To develop eminent scholar with a lifelong follows up of global standards by offering UG, PG and Doctoral Programmes.
- To pursue Professional and Career growth by collaborating mutually beneficial partnership with industries and higher institutes of research.
- To promote sustained research and training with emphasis on human values and leadership qualities.
- To contribute solutions for the need based issues of our society by proper ways and means as dutiful citizen.

DEPARTMENT OF MECHANICAL ENGINEERING

About the Department

The Department of Mechanical Engineering was established in 2005. It is equipped with state-of-the-art workshops, laboratories, and computing facilities. The department has highly qualified and experienced faculty members. These faculty members actively engage in research and consistently publish papers in international and national journals. Guest lectures and industrial visits are periodically arranged for the students to enhance their curriculum. The department strives for all-around excellence in students, encouraging them in all extracurricular activities.

Vision:
To develop highly skilled Mechanical Engineers dedicated to serving society

Mission:
M1: To Foster a dynamic learning environment that prepares competent student-research scholars in Mechanical Engineering.

M2: To Build state-of-the-art laboratories to meet technological advancements and transformations.

M3: To Uphold moral and ethical principles among faculty and students.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	**Academic Excellence** Excel as successful engineers or entrepreneurs.
PEO 2	**Leadership Quality** Become effective leaders, demonstrating professionalism and a commitment to lifelong learning.
PEO 3	**Research skill and Ethics** Handle real-time projects while upholding ethical values.

PROGRAM OUTCOMES (POs)

PO	Graduate Attribute
PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles ofmathematics, natural sciences, and engineering sciences.
PO3	**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.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation ofdata, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequentresponsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, andneed for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**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.
PO11	**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.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technologicalchange.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1	Apply fundamental and advanced concepts in mechanical engineering across multiple domains, such as materials, design, manufacturing, and thermal engineering, to effectively design, develop, and implement complex products and systems.
PSO 2	Identify, select, and effectively utilize ICT tools commonly employed Mechanical Engineering such as Computer-Aided Design (CAD) software, simulation software, and data analysis tools to create and apply innovative solutions for the betterment of society.

PEO's – PO's & PSO's MAPPING:

PEO	**PO**												**PSO**	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
I.	**3**	**3**	**3**	**3**	**2**	**3**		**2**	**2**	**3**	**3**	**2**	**3**	**3**
II.	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**
III.	**3**	**3**	**2**	**2**	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**

DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE (AUTONOMOUS), PERAMBALUR – 621 212

B.E. MECHANICAL ENGINEERING

REGULATIONS – 2023

CHOICE BASED CREDIT SYSTEM

SEMESTER I

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	IP3151	Induction programme	MC	-	-	-	-	0
2	U23HST11	Communicative English	HSM	3	0	0	3	3
3	U23MAT12	Matrices and Calculus	BS	3	1	0	4	4
4	U23PHT13	Physics for Engineers and Technologists	BS	3	0	0	3	3
5	U23CYT14	Chemistry for Engineering and Technology	BS	3	0	0	3	3
6	U23GET16	Engineering Graphics	ES	2	0	4	6	4
7	GE3152	Heritage of Tamils /தமிழர் மரபு	HSM	1	0	0	1	1
PRACTICAL								
8	U23BSP11	Physics and Chemistry Laboratory	BS	0	0	4	4	2
9	U23HSP12	English Laboratory	EE	0	0	2	2	1
10	U23GEP14	Engineering Practices Laboratory	ES	0	0	4	4	2
			TOTAL	**15**	**1**	**14**	**30**	**23**

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23HST21	Professional English	HSM	2	0	0	2	2
2	U23MAT22	Statistics and Numerical Methods	BS	3	1	0	3	4
3	U23GET15	Problem Solving and Python Programming	ES	3	0	0	3	3
4	U23PHT23	Applied Material Science	BS	3	0	0	3	3
5	U23EET23	Basic Electrical and Electronics Engineering	ES	3	0	0	3	3
6	U23MET21	Engineering Mechanics	ES	3	0	0	3	3
7	GE3252	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HSMC	1	0	0	1	1
8		NCC Credit Course level 1	-	2	0	0	2	2*
PRACTICAL								
9	U23GEP13	Problem Solving and Python Programming Laboratory	ES	0	0	4	4	2
10	U23EEP22	Basic Electrical and Electronics Engineering Laboratory	ES	0	0	4	4	2
11	U23HSP22	Communication Laboratory	EE	0	0	4	4	2
			TOTAL	**16**	**1**	**12**	**28**	**25**

SEMESTER III

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MAT31	Transforms and Partial Differential Equations	BS	3	1	0	4	4
2	U23MET31	Engineering Thermodynamics	PC	3	0	0	3	3
3	U23MET32	Fluid Mechanics and Machinery	ES	3	0	0	3	3
4	U23MET34	Engineering Materials and Metallurgy	ES	3	0	0	3	3
5	U23MET35	Manufacturing Processes	PC	3	0	0	3	3
PRACTICAL								
6	U23MEP31	Computer Aided Machine Drawing Laboratory	ES	0	0	4	4	2
7	U23MEP32	Manufacturing Technology Laboratory	PC	0	0	4	4	2
8	U23GE3361	Professional Development	EE	0	0	2	2	1
		TOTAL		**18**	**1**	**10**	**26**	**21**

SEMESTER IV

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MET41	Kinematics of Machinery	PC	3	0	0	3	3
2	U23MET42	Thermal Engineering	PC	3	0	0	3	3
3	U23MET43	Strength of Materials	PC	3	0	0	3	3
4	U23MET44	Computer Aided Design	PC	3	0	0	3	3
5	U23MET45	Manufacturing Technology	PC	3	0	0	3	3
6	U23GET41	Environmental Sciences and Engineering	BS	2	0	0	2	2
PRACTICAL								
7	U23MEP41	Strength of Materials and Fluid Machinery Laboratory	PC	0	0	4	4	2
8	U23MEP42	Thermal Engineering Laboratory	PC	0	0	4	4	2
		TOTAL		**18**	**0**	**8**	**26**	**21**

SEMESTER V

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MET51	Design of Machine Elements	PC	3	0	0	3	3
2	U23MET52	Dynamics of Machines	PC	3	0	0	3	3
3	U23MET53	Metrology and Measurements	PC	3	0	0	3	3
4		Professional Elective-I	PE	3	0	0	3	3
5		Professional Elective-II	PE	3	0	0	3	3
6		Open Elective – I	OE	3	0	0	3	3
PRACTICAL								
7	U23MEP51	Metrology and Measurements Laboratory	PC	0	0	4	4	2
8	U23MEP52	Dynamics Laboratory	PC	0	0	4	4	2
		TOTAL		**18**	**0**	**8**	**26**	**22**

SEMESTER VI

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MET61	Heat and Mass Transfer	PC	3	0	0	3	3
2	U23MET62	Design of Transmission System	PC	3	0	0	3	3
3	U23GET61	Human Values and Ethics	HSM	2	0	0	2	2
4		Professional Elective-III	PE	3	0	0	3	3
5		Professional Elective-IV	PE	3	0	0	3	3
6		Open Elective – II	OE	3	0	0	3	3
PRACTICAL								
7	U23MEP61	CAD/CAM Laboratory	PC	0	0	4	4	2
8	U23MEP62	Heat Transfer Laboratory	PC	0	0	4	4	2
9		Summer Internship*	EE	0	0	0	0	1
			TOTAL	**17**	**0**	**8**	**25**	**22**

***Two weeks Summer Internship carries one credit and it will be done during V semester summer vacation and same will be evaluated in VI semester**

SEMESTER VII

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MET71	Mechatronics and IoT	PC	3	0	0	3	3
2	U23MET72	Computer Integrated Manufacturing	PC	3	0	0	3	3
3	U23MET73	Power Plant Engineering	PC	3	0	0	3	3
4		Professional Elective-V	PE	3	0	0	3	3
5		Professional Elective-VI	PE	3	0	0	3	3
6		Professional Elective-VII	PE	3	0	0	3	3
PRACTICAL								
7	U23MEP71	Mechatronics and IoT Laboratory	PC	0	0	4	4	2
8	U23MEP72	Simulation and Analysis Laboratory	PC	0	0	4	4	2
			TOTAL	**18**	**0**	**8**	**26**	**22**

SEMESTER VIII

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MET81	Production Planning and Control	PC	3	0	0	3	3
2	U23GET76	Industrial Management	HSM	3	0	0	3	3
PRACTICAL								
3	U23MEP81	Project Work	EE	0	0	16	16	8
			TOTAL	**6**	**0**	**16**	**22**	**14**

VERTICALS – I (PROCESS EQUIPMENT AND PIPING DESIGN)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MEV11	Design of Pressure Vessels	PE	3	0	0	3	3
2	U23MEV12	Failure Analysis and NDT Techniques	PE	2	0	2	4	3
3	U23MEV13	Material Handling and Solid Processing Equipment	PE	3	0	0	3	3
4	U23MEV14	Rotating Machinery Design	PE	3	0	0	3	3
5	U23MEV15	Thermal and Fired Equipment Design	PE	3	0	0	3	3
6	U23MEV16	Industrial Layout Design and Safety	PE	2	0	2	4	3
7	U23MEV17	Design Codes and Standards	PE	3	0	0	3	3

VERTICALS – II (ROBOTICS AND AUTOMATION)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23RAT42	Sensors and Instrumentation	PE	3	0	0	3	3
2	U23RAT33	Electrical Drives and Actuators	PE	3	0	0	3	3
3	U23RAT51	Embedded Systems and Programming	PE	2	0	2	4	3
4	U23MEV24	Modeling and Control of Robot	PE	3	0	0	3	3
5	U23RAV33	Smart Mobility and Intelligent Vehicles	PE	3	0	0	3	3
6	U23MEV26	Haptics and Immersive Technologies	PE	3	0	0	3	3
7	U23RAV12	Drone Technologies	PE	3	0	0	3	3

VERTICALS – III (CLEAN AND GREEN ENERGY TECHNOLOGIES)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MEV31	Bio energy Conversion Technologies	PE	3	0	0	3	3
2	U23MEV32	Carbon Footprint Estimation and Reduction Techniques	PE	3	0	0	3	3
3	U23MEV33	Energy Conservation in Industries	PE	3	0	0	3	3
4	U23CEV67	Energy Efficient Buildings	PE	3	0	0	3	3
5	U23MEV35	Energy Storage Devices	PE	3	0	0	3	3
6	U23MEV36	Renewable Energy Technologies	PE	3	0	0	3	3
7	U23MEV37	Equipment for Pollution Control	PE	3	0	0	3	3

VERTICALS – IV (3D PRINTING)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MEV41	Introduction to Product Design	PE	3	0	0	3	3
2	U23MEV42	Additive Manufacturing Processes	PE	3	0	0	3	3
3	U23MEV43	Design for Additive Manufacturing	PE	3	0	0	3	3
4	U23MEO12	Reverse Engineering	PE	3	0	0	3	3
5	U23MEV45	Business Value Enhancement with Additive Manufacturing	PE	3	0	0	3	3
6	U23MEV46	Lithographic process	PE	3	0	0	3	3
7	U23MEV47	Printing Technology	PE	3	0	0	3	3

VERTICALS – V (DIVERSIFIED COURSES GROUP)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MEV51	Automobile Engineering	PE	3	0	0	3	3
2	U23MEV52	Measurements and Controls	PE	3	0	0	3	3
3	U23MEV53	Non-traditional Machining Processes	PE	3	0	0	3	3
4	U23MEV54	Composite Materials and Mechanics	PE	3	0	0	3	3
5	U23MEV55	Gas Dynamics and Jet Propulsion	PE	3	0	0	3	3
6	U23MEV56	Hydraulics and Pneumatics	PE	3	0	0	3	3
7	U23MEV57	Refrigeration And Air Conditioning	PE	3	0	0	3	3

VERTICAL-VI: (MODERN MOBILITY SYSTEMS)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MEV61	Automotive Materials, Components, Design and Testing	PE	2	0	2	4	3
2	U23MEV62	Conventional and Futuristic Vehicle Technology	PE	3	0	0	3	3
3	U23MEV63	Renewable Powered Off Highway Vehicles and Emission Control Technology	PE	3	0	0	3	3
4	U23MEV64	Vehicle Health Monitoring, Maintenance and Safety	PE	3	0	0	3	3
5	U23MEV65	CAE and CFD Approach in Future Mobility	PE	2	0	2	4	3
6	U23MEV66	Hybrid and Electric Vehicle Technology	PE	3	0	0	3	3
7	U23MEV67	Thermal Management of Batteries and Fuel Cells	PE	3	0	0	3	3

OPEN ELECTIVES-I

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MEO11	Applied Design Thinking	OE	2	0	2	4	3
2	U23MEO12	Reverse Engineering	OE	3	0	0	3	3
3	U23MEO13	Quality Engineering	OE	3	0	0	3	3
4	U23MEO14	Functional Materials	OE	3	0	0	3	3
5	U23MEO15	Fire Safety Engineering	OE	3	0	0	3	3

OPEN ELECTIVES-II

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MEO21	Industrial Design & Rapid Prototyping Techniques	OE	2	0	2	4	3
2	U23MEO22	Micro and Precision Engineering	OE	3	0	0	3	3
3	U23MEO23	Energy Conservation and Management	OE	3	0	0	3	3
4	U23MEO24	Nanomaterials and applications	OE	3	0	0	3	3
5	U23RAO11	Industrial Robotics And Material Handling Systems	OE	3	0	0	4	3

SUMMARY

Sl. No.	Subject Area	Credits persemester								Credits Total	Percentage %
		I	II	III	IV	V	VI	VII	VIII		
1	Humanities and Social Sciences	**4**	**3**	-	-	-	**2**	-	**3**	**12**	**7.06**
2	Basic Sciences	**12**	**7**	**4**	**2**	-	-	-	-	**25**	**14.71**
3	Engineering Sciences	**6**	**13**	**8**	-	-	-	-	-	**27**	**15.88**
4	Professional Core	-	-	**8**	**19**	**13**	**10**	**13**	**3**	**66**	**38.82**
5	Professional Elective	-	-	-	-	**6**	**6**	**9**	-	**21**	**12.35**
6	Open Elective	-	-	-	-	**3**	**3**	-	-	**6**	**3.53**
7	Employability Enhancement Courses	**1**	**2**	**1**	-	-	**1**	-	**8**	**13**	**7.65**
Total		**23**	**23**	**25**	**21**	**21**	**22**	**22**	**22**	**14**	**170**