SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)
Gobichettipalayam, Erode-638455

Regulation 2023 (Autonomous)

Curriculum and Syllabus

Choice Based Credit System (CBCS)

BE- MECHANICAL ENGINEERING

	SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE **(Autonomous)** **Gobichettipalayam, Erode -638455**
	Regulation 2023 (UG) **Curriculum and Syllabus** **BE-Mechanical Engineering**

I. Program Educational Objective (PEO)

PEO1: **Successful Career:** Effectuating success in careers by exploring with the design, digital and computational analysis of engineering systems, experimentation and testing, smart manufacturing, technical services, and research.

PEO2: **Core Competency:** Amalgamating effectively with stakeholders to update and improve their core competencies and abilities to ethically compete in the ever-changing multicultural global enterprise.

PEO3: **Technological Development:** To develop the advanced technology and to nurture innovation and entrepreneurship in order to compete successfully in the global economy.

PEO4: **Technical Knowledge:** To globally share and apply technical knowledge to create new opportunities that proactively advances our society through team efforts and to solve various challenging technical, environmental and societal problems.

PEO5: **Proficiency:** To create world class mechanical engineers capable of practice engineering ethically with a solid vision to become great leaders in academia, industries and society.

II. 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 and IT tools including prediction and modeling to complex engineering activities 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 responsibilities relevant 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 and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader 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 engage in independent and life-long learning in the broadest context of technological change.

III. Program Specific Outcomes (PSOs)

PSO1: **Design and Development**: Apply the knowledge gained in Mechanical Engineering for design and development and manufacture of engineering systems.

PSO2: **Investigate**: Apply the knowledge acquired to investigate the problems in Mechanical Engineering with due consideration for environmental and social impacts.

PSO3: **Engineering Analysis**: Use the engineering analysis and data management tools for effective management of multidisciplinary projects.

			PO												PSO		
Mapping of Course Outcome and Programme Outcome																	
Year	**Sem**	**Course name**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
I	I	Professional English - I	-	-	-	2	-	1	-	-	2	3	-	3	-	-	-
		Matrices and Calculus	3	3	1	1	-	-	-	-	2	-	2	3	3	3	1
		Engineering Physics	3	3	2	1	2	-	-	-	-	-	-	1	3	3	2
		Engineering Chemistry	3	2	2	1	1	2	3	-	-	-	-	1	-	-	-
		Problem Solving and Python Programming	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3
		தமிழர் மரபு /Heritage of Tamils	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Problem Solving and Python Programming Laboratory	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3
		Physics and Chemistry Laboratory	3	3	1	1	-	-	-	-	-	-	-	-	-	-	-
			3	2	1	-	1	3	2	1	-	-	-	1	-	-	-
		English Laboratory	-	-	-	-	-	-	-	1	3	3	-	2	-	-	-
I	II	Professional English - II	-	1	1	-	-	-	1	1	2	3	-	2	-	-	-
		Numerical Methods and Statistics	3	3	1	1	1	-	-	-	2	-	2	3	-	-	-
		Materials Science	3	2	2	1	2	2	2	-	-	-	-	1	-	-	-
		Basic Electrical and Electronics Engineering	3	3	2	2	-	-	-	-	-	1	-	-	3	3	2
		Engineering Graphics	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
		தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Engineering Practices Laboratory	3	2	-	-	1	1	1	-	-	-	-	2	2	1	1
		Basic Electrical and Electronics Engineering Laboratory	3	3	2	1	1	-	-	-	2	-	-	-	3	2	-
		Communication Laboratory	-	-	2	-	-	-	-	1	3	3	-	3	-	-	-

1 - low, 2 - medium, 3 - high, '-' - no correlation

SUMMARY OF CREDITS

S.No	Course Category	Credits per Semester								Total Credits	Credits in %	Credits as per AU Curriculum	Credits as per AICTE Model Curriculum
		I	II	III	IV	V	VI	VII	VIII				
1	HSS	4	3					5		12	7.10	12	12
2	BS	12	7	4	2					25	14.79	25	29
3	ES	5	11	9						25	14.79	25	27
4	PC			11	20	9	8	8		56	33.14	56	58
5	PE					9	12			21	12.43	21	9
6	OE						3	9		12	7.10	12	9
7	EEC	1	2	1		1		3	10	18	10.65	16	16
8	MC		√		√	√ √	√						-
Total Credits / Semester		22	23	25	22	19	23	25	10	169	100	167	160

CATEGORIZATION OF COURSES

    i. Humanities and Social Sciences including Management Courses (HSS)
    ii. Basic Science Courses (BS)
    iii. Engineering Science Courses (ES)
    iv. Professional Core Courses (PC)
    v. Professional Elective Courses (PE)
    vi. Open Elective Courses (OE)
    vii. Mandatory Courses (MC)
    viii. Employability Enhancement Courses (EEC)
    ix. Other Courses (OC)

ENROLLMENT FOR B.E. / B. TECH. (HONOURS) / MINOR DEGREE (OPTIONAL)

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E. / B. Tech. (Honours) or Minor Degree.

For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only.

For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes.

		SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
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		Gobichettipalayam, Erode -638455

Regulation 2023 (UG)
Curriculum and Syllabus
BE-Mechanical Engineering

SEMESTER I

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Induction Program											
1.	23IPA11	Induction Programme	-	-	-	-	-	0	-	-	-
Theory											
2.	23ENT11	Professional English - I	HSS	3	0	0	3	3	40	60	100
3.	23MAT11	Matrices and Calculus	BS	3	1	0	4	4	40	60	100
4.	23PHT11	Engineering Physics	BS	3	0	0	3	3	40	60	100
5.	23CYT11	Engineering Chemistry	BS	3	0	0	3	3	40	60	100
6.	23CST11	Problem Solving and Python Programming	ES	3	0	0	3	3	40	60	100
7.	23TAT11	தமிழர் மரபு / Heritage of Tamils	HSS	1	0	0	1	1	40	60	100
Practicals											
8.	23CSL11	Problem Solving and Python Programming Laboratory	ES	0	0	4	4	2	60	40	100
9.	23PCL11	Physics and Chemistry Laboratory	BS	0	0	4	4	2	60	40	100
10.	23ENL11	English Laboratory	EEC	0	0	2	2	1	60	40	100
		Total		**16**	**1**	**10**	**27**	**22**			

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Regulation 2023 (UG)
Curriculum and Syllabus
BE-Mechanical Engineering

SEMESTER II

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23ENT21	Professional English - II	HSS	2	0	0	2	2	40	60	100
2.	23MAT21	Numerical Methods and Statistics	BS	3	1	0	4	4	40	60	100
3.	23PHT23	Materials Science	BS	3	0	0	3	3	40	60	100
4.	23EET22	Basic Electrical and Electronics Engineering	ES	3	0	0	3	3	40	60	100
5.	23MET21	Engineering Graphics	ES	2	0	4	6	4	40	60	100
6.	23TAT21	தமிழரும் தொழில் நுட்பமும் / Tamils and Technology	HSS	1	0	0	1	1	40	60	100
Practicals											
7.	23MEL21	Engineering Practices Laboratory	ES	0	0	4	4	2	60	40	100
8.	23EEL22	Basic Electrical and Electronics Engineering Laboratory	ES	0	0	4	4	2	60	40	100
9.	23ENL21	Communication Laboratory	EEC	0	0	4	4	2	60	40	100
Mandatory Courses											
10.	23MCL21	Mandatory Course - I [&]	MC	0	0	1	1	0	100	-	100
			Total	**14**	**1**	**17**	**32**	**23**			

[&] Mandatory Course-I

Yoga for Human Excellence	Non-credit Course

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Regulation 2023 (UG)
Curriculum and Syllabus
BE-Mechanical Engineering

SEMESTER III

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23MAT32	Transforms and Partial Differential Equations	BS	3	1	0	4	4	40	60	100
2.	23MET31	Engineering Mechanics	ES	3	0	0	3	3	40	60	100
3.	23MET32	Fluid Mechanics and Machinery	ES	3	1	0	4	4	40	60	100
4.	23MET33	Engineering Thermodynamics	PC	3	0	0	3	3	40	60	100
5.	23MET34	Engineering Materials and Metallurgy	PC	3	0	0	3	3	40	60	100
6.	23MET35	Manufacturing Processes	PC	3	0	0	3	3	40	60	100
Practicals											
7.	23MEL31	Computer Aided Machine Drawing	ES	0	0	4	4	2	60	40	100
8.	23MEL32	Manufacturing Technology Laboratory	PC	0	0	4	4	2	60	40	100
9.	23PDL31	Professional Development	EEC	0	0	2	2	1	100	-	100
			Total	**18**	**2**	**10**	**30**	**25**			

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Regulation 2023 (UG)
Curriculum and Syllabus
BE-Mechanical Engineering

SEMESTER IV

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23MET41	Theory of Machines	PC	3	0	0	3	3	40	60	100
2.	23MET42	Thermal Engineering	PC	4	0	0	4	4	40	60	100
3.	23MET43	Hydraulics and Pneumatics	PC	3	0	0	3	3	40	60	100
4.	23MET44	Manufacturing Technology	PC	3	0	0	3	3	40	60	100
5.	23MET45	Strength of Materials	PC	3	0	0	3	3	40	60	100
6.	23CYT41	Environmental Sciences and Sustainability	BS	2	0	0	2	2	40	60	100
Practicals											
7.	23MEL41	Strength of Materials and Fluid Machinery Laboratory	PC	0	0	4	4	2	60	40	100
8.	23MEL42	Thermal Engineering Laboratory	PC	0	0	4	4	2	60	40	100
Mandatory Courses											
9.	23SAT41	Soft and Analytical Skills-I**&**	MC	1	0	0	1	0	-	-	-
		Total		**19**	**0**	**8**	**26**	**22**			

& **Soft and Analytical Skills-I is a Non-credit Course**

@ The students individually undergo training in reputed Firms/Research Institutes/Laboratories for the specified duration (2 weeks) during IV semester summer vacation. After completion of training, a detailed report should be submitted within ten days from the commencement of V semester.

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	(Autonomous)
	Gobichettipalayam, Erode -638455

Regulation 2023 (UG)
Curriculum and Syllabus
BE-Mechanical Engineering

SEMESTER V

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23MET51	Design of Machine Elements	PC	4	0	0	4	4	40	60	100
2.	23MET52	Metrology and Measurements	PC	3	0	0	3	3	40	60	100
3.		Professional Elective I*	PE	-	-	-	-	3	-	-	100
4.		Professional Elective II*	PE	-	-	-	-	3	-	-	100
5.		Professional Elective III*	PE	-	-	-	-	3	-	-	100
Practicals											
6.	23MEL51	Summer Internship@	EEC	0	0	0	0	1	100	-	100
7.	23MEL52	Metrology and Dynamics Laboratory	PC	0	0	4	4	2	60	40	100
Mandatory Courses											
8.		Mandatory Course-II&	MC	3	0	0	3	0	100	-	100
9.	23SAT51	Soft and Analytical Skills-II&&	MC	1	0	0	1	0	-	-	-
			Total	**20**	**0**	**4**	**24**	**19**			

* **Professional Elective – I to III shall be chosen from the list of Professional Electives (Verticals) offered by same Programme**

@ **The students undergone summer internship during IV semester summer vacation and same will be evaluated in V semester.**

& **Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-II)**

&& **Soft and Analytical Skills-II is a Non-credit Course**

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Regulation 2023 (UG)
Curriculum and Syllabus
BE-Mechanical Engineering

SEMESTER VI

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23MET61	Heat and Mass Transfer	PC	3	1	0	4	4	40	60	100
2.		Professional Elective IV*	PE	-	-	-	-	3	-	-	100
3.		Professional Elective V*	PE	-	-	-	-	3	-	-	100
4.		Professional Elective VI*	PE	-	-	-	-	3	-	-	100
5.		Professional Elective VII*	PE	-	-	-	-	3	-	-	100
6.		Open Elective – I**	OE	-	-	-	-	3	-	-	100
Practicals											
7.	23MEL61	CAD/CAM Laboratory	PC	0	0	4	4	2	60	40	100
8.	23MEL62	Heat Transfer Laboratory	PC	0	0	4	4	2	60	40	100
Mandatory Courses											
9.		Mandatory Course - III&	MC	3	0	0	3	0	100	-	100
		Total		**21**	**1**	**8**	**30**	**23**			

 * **Professional Elective – IV to VII shall be chosen from the list of Professional Electives (Verticals) offered by same Programme**

** **Open Elective – I shall be chosen from the list of open electives offered by other Programmes**

 & **Mandatory Course-III is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-III)**

@ **The students individually undergo training in reputed Firms/Research Institute/Laboratories for the specified duration (2 weeks) during VI semester summer vacation. After completion of training, a detailed report should be submitted within ten days from the commencement of VII semester.**

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Regulation 2023 (UG)
Curriculum and Syllabus
BE-Mechanical Engineering

SEMESTER VII

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23MET71	Mechatronics and IoT	PC	3	0	0	3	3	40	60	100
2.	23MET72	Computer Integrated Manufacturing	PC	3	0	0	3	3	40	60	100
3.	23UHV71	Human Values and Ethics	HSS	2	0	0	2	2	40	60	100
4.		Elective – Management #	HSS	3	0	0	3	3	40	60	100
5.		Open Elective – II**	OE	-	-	-	-	3	-	-	100
6.		Open Elective – III**	OE	-	-	-	-	3	-	-	100
7.		Open Elective – IV**	OE	-	-	-	-	3	-	-	100
Practicals											
8.	23MEL71	Summer Internship@	EEC	0	0	0	0	1	100	-	100
9.	23MEL72	Design and Fabrication Project	EEC	0	0	4	4	2	40	60	100
10.	23ECL72	Mechatronics and IoT Laboratory	PC	0	0	4	4	2	60	40	100
			Total	20	0	4	28	25			

Elective – Management shall be chosen from the list of Elective management courses.

** Open Elective – II to IV shall be chosen from the list of open electives offered by other Programmes

@ The students undergone summer internship during VI semester summer vacation and same will be evaluated in VII semester.

<table>
<tr><td rowspan="3">S.No</td><td rowspan="3">Course Code</td><td rowspan="3">Course Title</td><td rowspan="3">Category</td><td colspan="3">Periods / Week</td><td rowspan="3">Total Contact Period</td><td rowspan="3">Credits</td><td colspan="3">Max.Marks</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>CA</td><td>ES</td><td>TM</td></tr>
<tr><td colspan="10" align="center">Practicals</td></tr>
<tr><td>1.</td><td>23MEL81</td><td>Project Work</td><td>EEC</td><td>0</td><td>0</td><td>20</td><td>20</td><td>10</td><td>40</td><td>60</td><td>100</td></tr>
<tr><td colspan="3"></td><td align="right">Total</td><td>0</td><td>0</td><td>20</td><td>20</td><td>10</td><td></td><td></td><td></td></tr>
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Gobichettipalayam, Erode -638455

Regulation 2023 (UG)
Curriculum and Syllabus
BE-Mechanical Engineering

SEMESTER VIII

TOTAL CREDITS: 169

MANDATORY COURSES II

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MCT51	Introduction to Women and Gender Studies	MC	3	0	0	3	0	100	-	100
2.	23MCT52	Elements of Literature	MC	3	0	0	3	0	100	-	100
3.	23MCT53	Film Appreciation	MC	3	0	0	3	0	100	-	100
4.	23MCT54	Disaster Risk Reduction and Management	MC	3	0	0	3	0	100	-	100

MANDATORY COURSES III

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MCT61	Well Being with Traditional Practices - Yoga, Ayurveda and Siddha	MC	3	0	0	3	0	100	-	100
2.	23MCT62	History of Science and Technology in India	MC	3	0	0	3	0	100	-	100
3.	23MCT63	Political and Economic Thought for a Humane Society	MC	3	0	0	3	0	100	-	100
4.	23MCT64	State, Nation Building and Politics in India	MC	3	0	0	3	0	100	-	100
5.	23MCT65	Industrial Safety	MC	3	0	0	3	0	100	-	100

ELECTIVE – MANAGEMENT COURSES

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MSE71	Principles of Management	HSS	3	0	0	3	3	40	60	100
2.	23MSE72	Total Quality Management	HSS	3	0	0	3	3	40	60	100
3.	23MSE73	Engineering Economics and Financial Accounting	HSS	3	0	0	3	3	40	60	100
4.	23MSE74	Human Resource Management	HSS	3	0	0	3	3	40	60	100
5.	23MSE75	Knowledge Management	HSS	3	0	0	3	3	40	60	100
6.	23MSE76	Industrial Management	HSS	3	0	0	3	3	40	60	100

PROFESSIONAL ELECTIVE COURSES: VERTICALS

VERTICAL 1	VERTICAL 2	VERTICAL 3	VERTICAL 4	VERTICAL 5	VERTICAL 6	VERTICAL 7	VERTICAL 8	VERTICAL 9	VERTICAL 10
MODERN MOBILITY SYSTEMS	PRODUCT AND PROCESS DEVELOPMENT	ROBOTICS AND AUTOMATION	DIGITAL AND GREEN MANUFACTURING	PROCESS EQUIPMENT AND PIPING DESIGN	CLEAN AND GREEN ENERGY TECHNOLOGIES	COMPUTATIONAL ENGINEERING	DIVERSIFIED COURSES GROUP 1	DIVERSIFIED COURSES GROUP 2	DIVERSIFIED COURSES GROUP 3
Automotive Materials, Components, Design & Testing	Value Engineering	Sensors and Instrumentation	Digital Manufacturing and IoT	Design of Pressure Vessels	Bioenergy Conversion Technologies	Computational Solid Mechanics	Automobile Engineering	Turbo Machines	Advanced Vehicle Engineering
Conventional and Futuristic Vehicle Technology	Additive Manufacturing	Electrical Drives and Actuators	Modern Robotics	Failure Analysis and NDT Techniques	Carbon Footprint estimation and reduction techniques	Computational Fluid Dynamics and Heat transfer	Measurements and Controls	Non-traditional Machining Processes	Advanced Internal Combustion Engineering
Renewable Powered Off Highway Vehicles and Emission Control Technology	CAD/CAM	Embedded Systems and Programming	Lean Manufacturing	Material Handling and solid processing Equipment	Energy Conservation in Industries	Theory on Computation and Visualization	Design Concepts in Engineering	Industrial safety	Casting and Welding Processes
Vehicle Health Monitoring, Maintenance and Safety	Design For X	Robotics	Green Manufacturing Design and Practices	Rotating Machinery Design	Energy Efficient Buildings	Computational Bio- Mechanics	Composite Materials and Mechanics	Thermal Power Engineering	Process Planning and Cost Estimation
CAE and CFD Approach in Future Mobility	Ergonomics in Design	Smart Mobility and Intelligent Vehicles	Environment Sustainability and Impact Assessment	Thermal and Fired Equipment design	Energy Storage Devices	Advanced Statistics and Data Analytics	Electrical Drives and Control	Design of Transmission System	Surface Engineering
Hybrid and Electric Vehicle Technology	New Product Development	Haptics and Immersive Technologies	Energy Saving Machinery and Components	Industrial Layout Design and Safety	Equipment for Pollution Control	CAD and CAE	Power Plant Engineering	Design for Manufacturing	Precision Manufacturing
Thermal Management of Batteries and Fuel Cells	Product Life Cycle Management	Drone Technologies	Green Supply Chain Management	Design Codes and Standards	Renewable Energy Technologies	Machine Learning for Intelligent Systems	Refrigeration and Air Conditioning	Power Generation Equipment Design	Gas Dynamics and Jet Propulsion
-	-	-	-	-	-	-	Dynamics of Ground Vehicles	-	Operational Research

Registration of Professional Elective Courses from Verticals:

Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialisation / diversified group. Students are permitted to choose all the Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E/B.Tech (Honours) or Minor degree also. For more details on B.E./B.Tech (Honours) or Minor degree refer to the Regulations 2023 (Clause 12).

VERTICAL 1 : MODERN MOBILITY SYSTEMS

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEE11	Automotive Materials, Components, Design and Testing	PE	2	0	2	4	3	50	50	100
2.	23MEE12	Conventional and Futuristic Vehicle Technology	PE	3	0	0	3	3	40	60	100
3.	23MEE13	Renewable Powered Off Highway Vehicles and Emission Control Technology	PE	3	0	0	3	3	40	60	100
4.	23MEE14	Vehicle Health Monitoring, Maintenance and Safety	PE	3	0	0	3	3	40	60	100
5.	23MEE15	CAE and CFD Approach in Future Mobility	PE	2	0	2	4	3	50	50	100
6.	23MEE16	Hybrid and Electric Vehicle Technology	PE	3	0	0	3	3	40	60	100
7.	23MEE17	Thermal Management ofBatteries and Fuel Cells	PE	3	0	0	3	3	40	60	100

VERTICAL 2 : PRODUCT AND PROCESS DEVELOPMENT

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEE21	Value Engineering	PE	3	0	0	3	3	40	60	100
2.	23MEE22	Additive Manufacturing	PE	2	0	2	4	3	50	50	100
3.	23MEE23	CAD/CAM	PE	3	0	0	3	3	40	60	100
4.	23MEE24	Design For X	PE	3	0	0	3	3	40	60	100
5.	23MEE25	Ergonomics in Design	PE	3	0	0	3	3	40	60	100
6.	23MEE26	New Product Development	PE	3	0	0	3	3	40	60	100
7.	23MEE27	Product Life Cycle Management	PE	3	0	0	3	3	40	60	100

VERTICAL 3: ROBOTICS AND AUTOMATION

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEE31	Sensors and Instrumentation	PE	3	0	0	3	3	40	60	100
2.	23MEE32	Electrical Drives and Actuators	PE	3	0	0	3	3	40	60	100
3.	23MEE33	Embedded Systems and Programming	PE	2	0	2	4	3	50	50	100
4.	23MEE34	Robotics	PE	3	0	0	3	3	40	60	100
5.	23MEE35	Smart Mobility and Intelligent Vehicles	PE	3	0	0	3	3	40	60	100
6.	23MEE36	Haptics and Immersive Technologies	PE	3	0	0	3	3	40	60	100
7.	23MEE37	Drone Technologies	PE	3	0	0	3	3	40	60	100

VERTICAL 4: DIGITAL AND GREEN MANUFACTURING

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEE41	Digital Manufacturing and IoT	PE	2	0	2	4	3	50	50	100
2.	23MEE42	Modern Robotics	PE	2	0	2	4	3	50	50	100
3.	23MEE43	Lean Manufacturing	PE	3	0	0	3	3	40	60	100
4.	23MEE44	Green Manufacturing Design and Practices	PE	3	0	0	3	3	40	60	100
5.	23MEE45	Environment Sustainability and Impact Assessment	PE	3	0	0	3	3	40	60	100
6.	23MEE46	Energy Saving Machinery and Components	PE	3	0	0	3	3	40	60	100
7.	23MEE47	Green Supply Chain Management	PE	3	0	0	3	3	40	60	100

VERTICAL 5: PROCESS EQUIPMENT AND PIPING DESIGN

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEE51	Design of Pressure Vessels	PE	3	0	0	3	3	40	60	100
2.	23MEE52	Failure Analysis and NDT Techniques	PE	2	0	2	4	3	50	50	100
3.	23MEE53	Material Handling and Solid Processing Equipment	PE	3	0	0	3	3	40	60	100
4.	23MEE54	Rotating Machinery Design	PE	3	0	0	3	3	40	60	100
5.	23MEE55	Thermal and Fired Equipment Design	PE	3	0	0	3	3	40	60	100
6.	23MEE56	Industrial Layout Design and Safety	PE	2	0	2	4	3	50	50	100
7.	23MEE57	Design Codes and Standards	PE	3	0	0	3	3	40	60	100

VERTICAL 6: CLEAN AND GREEN ENERGY TECHNOLOGIES

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEE61	Bioenergy Conversion Technologies	PE	3	0	0	3	3	40	60	100
2.	23MEE62	Carbon Footprint Estimation and Reduction Techniques	PE	3	0	0	3	3	40	60	100
3.	23MEE63	Energy Conservation in Industries	PE	3	0	0	3	3	40	60	100
4.	23MEE64	Energy Efficient Buildings	PE	3	0	0	3	3	40	60	100
5.	23MEE65	Energy Storage Devices	PE	3	0	0	3	3	40	60	100
6.	23MEE66	Equipment for Pollution Control	PE	3	0	0	3	3	40	60	100
7.	23MEE67	Renewable Energy Technologies	PE	3	0	0	3	3	40	60	100

VERTICAL 7: COMPUTATIONAL ENGINEERING

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEE71	Computational Solid Mechanics	PE	3	0	0	3	3	40	60	100
2.	23MEE72	Computational Fluid Dynamics and Heat transfer	PE	3	0	0	3	3	40	60	100
3.	23MEE73	Theory on Computation and Visualization	PE	3	0	0	3	3	40	60	100
4.	23MEE74	Computational Bio-Mechanics	PE	3	0	0	3	3	40	60	100
5.	23MEE75	Advanced Statistics and Data Analytics	PE	3	0	0	3	3	40	60	100
6.	23MEE76	CAD and CAE	PE	2	0	2	4	3	50	50	100
7.	23MEE77	Machine Learning for Intelligent Systems	PE	3	0	0	3	3	40	60	100

VERTICAL 8: DIVERSIFIED COURSES GROUP 1

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEE81	Automobile Engineering	PE	3	0	0	3	3	40	60	100
2.	23MEE82	Measurements and Controls	PE	3	0	0	3	3	40	60	100
3.	23MEE83	Design Concepts in Engineering	PE	3	0	0	3	3	40	60	100
4.	23MEE84	Composite Materials and Mechanics	PE	3	0	0	3	3	40	60	100
5.	23MEE85	Electrical Drives and Control	PE	3	0	0	3	3	40	60	100
6.	23MEE86	Power Plant Engineering	PE	3	0	0	3	3	40	60	100
7.	23MEE87	Refrigeration and Air Conditioning	PE	3	0	0	3	3	40	60	100
8.	23MEE88	Dynamics of Ground Vehicles	PE	3	0	0	3	3	40	60	100

VERTICAL 9: DIVERSIFIED COURSES GROUP 2

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEE91	Turbo Machines	PE	3	0	0	3	3	40	60	100
2.	23MEE92	Non-traditional Machining Processes	PE	3	0	0	3	3	40	60	100
3.	23MEE93	Industrial safety	PE	3	0	0	3	3	40	60	100
4.	23MEE94	Thermal Power Engineering	PE	3	0	0	3	3	40	60	100
5.	23MEE95	Design of Transmission System	PE	3	0	0	3	3	40	60	100
6.	23MEE96	Design for Manufacturing	PE	3	0	0	3	3	40	60	100
7.	23MEE97	Power Generation Equipment Design	PE	3	0	0	3	3	40	60	100

VERTICAL 10: DIVERSIFIED COURSES GROUP 3

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MEEX1	Advanced Vehicle Engineering	PE	3	0	0	3	3	40	60	100
2.	23MEEX2	Advanced Internal Combustion Engineering	PE	3	0	0	3	3	40	60	100
3.	23MEEX3	Casting and Welding Processes	PE	3	0	0	3	3	40	60	100
4.	23MEEX4	Process Planning and Cost Estimation	PE	3	0	0	3	3	40	60	100
5.	23MEEX5	Surface Engineering	PE	3	0	0	3	3	40	60	100
6.	23MEEX6	Precision Manufacturing	PE	3	0	0	3	3	40	60	100
7.	23MEEX7	Gas Dynamics and Jet Propulsion	PE	3	0	0	3	3	40	60	100
8.	23MEEX8	Operational Research	PE	3	0	0	3	3	40	60	100

SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)
Gobichettipalayam, Erode -638455
Regulation 2023 (UG)
Curriculum and Syllabus

OPEN ELECTIVES

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
OFFERED BY DEPARTMENT OF CIVIL ENGINEERING											
1.	23CEO11	Civil and Infrastructure Engineering	OE	3	0	0	3	3	40	60	100
2.	23CEO12	Environmental Pollution and waste management	OE	3	0	0	3	3	40	60	100
3.	23CEO13	Environmental Impact Assessment	OE	3	0	0	3	3	40	60	100
4.	23CEO14	Building Services	OE	3	0	0	3	3	40	60	100
5.	23CEO15	Water, Sanitation and Health	OE	3	0	0	3	3	40	60	100
OFFERED BY DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING											
1.	23CSO11	Foundation of AR/VR	OE	2	0	2	4	3	50	50	100
2.	23CSO12	Web Designing	OE	2	0	2	4	3	50	50	100
3.	23CSO13	Block Chain fundamentals	OE	2	0	2	4	3	50	50	100
4.	23CSO14	Knowledge Management	OE	2	0	2	4	3	50	50	100
5.	23CSO15	Cloud Computing Essentials	OE	2	0	2	4	3	50	50	100
OFFERED BY DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING											
1.	23ECO11	Basics of electronics in automation	OE	3	0	0	3	3	40	60	100
2.	23ECO12	Optical engineering	OE	3	0	0	3	3	40	60	100
3.	23ECO13	E-waste management	OE	3	0	0	3	3	40	60	100
4.	23ECO14	Consumer electronics	OE	3	0	0	3	3	40	60	100
5.	23ECO15	Principles of communication engineering	OE	3	0	0	3	3	40	60	100

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
OFFERED BY DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING											
1.	23EEO11	Renewable Energy Sources	OE	3	0	0	3	3	40	60	100
2.	23EEO12	Electrical Vehicle	OE	3	0	0	3	3	40	60	100
3.	23EEO13	Energy Auditing and Conservation	OE	3	0	0	3	3	40	60	100
4.	23EEO14	Domestic and Industrial Electrical Installations	OE	3	0	0	3	3	40	60	100
5.	23EEO15	Microcontroller Based System Design	OE	3	0	0	3	3	40	60	100
OFFERED BY DEPARTMENT OF MECHANICAL ENGINEERING											
1.	23MEO11	Industrial Instrumentation	OE	3	0	0	3	3	40	60	100
2.	23MEO12	Energy Technology	OE	3	0	0	3	3	40	60	100
3.	23MEO13	Reverse Engineering	OE	3	0	0	3	3	40	60	100
4.	23MEO14	Fire Safety Engineering	OE	3	0	0	3	3	40	60	100
5.	23MEO15	Nano Technology	OE	3	0	0	3	3	40	60	100
6.	23MEO16	Entrepreneurship Development	OE	3	0	0	3	3	40	60	100
OFFERED BY DEPARTMENT ARTIFICIAL INTELLIGENCE AND DATA SCIENCE											
1.	23AD011	Introduction to Big Data	OE	2	0	2	4	3	50	50	100
2.	23AD012	Principles of Data Science	OE	2	0	2	4	3	50	50	100
3.	23AD013	Data Visualization and its Applications	OE	2	0	2	4	3	50	50	100
4.	23AD014	Data Warehousing and Mining	OE	2	0	2	4	3	50	50	100
5.	23AD015	Principles of Cyber Security	OE	2	0	2	4	3	50	50	100

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
OFFERED BY DEPARTMENT INFORMATION TECHNOLOGY											
1.	23IT011	Basics of Java Programming	OE	2	0	2	4	3	50	50	100
2.	23IT012	Ethical Hacking	OE	2	0	2	4	3	50	50	100
3.	23IT013	E-Commerce and Applications	OE	2	0	2	4	3	50	50	100
4.	23IT014	Basics of Android Application Development	OE	2	0	2	4	3	50	50	100
5.	23IT015	Introduction to Web Design	OE	2	0	2	4	3	50	50	100
OFFERED BY DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY											
1.	23PTO11	Nutraceuticals	OE	3	0	0	3	3	40	60	100
2.	23PTO12	IPR for Pharma Industry	OE	3	0	0	3	3	40	60	100
3.	23PTO13	Pharmaceutical Nanotechnology	OE	3	0	0	3	3	40	60	100
4.	23PTO14	Basics of Human Anatomy and physiology	OE	3	0	0	3	3	40	60	100
OFFERED BY DEPARTMENT BIOMEDICAL ENGINEERING											
1.	23BMO11	Biomedical Instrumentation	OE	3	0	0	3	3	40	60	100
2.	23BMO12	Medical Optics	OE	3	0	0	3	3	40	60	100
3.	23BMO13	Biometric systems and their applications	OE	3	0	0	3	3	40	60	100
4.	23BMO14	Healthcare Management systems	OE	3	0	0	3	3	40	60	100
5.	23BMO15	IOT in Medicine	OE	3	0	0	3	3	40	60	100

23MET21	ENGINEERING GRAPHICS (BE/B.Tech-Common to all Branches)	L T P C 2 0 4 4

Course Objectives:

The main learning objective of this course is to prepare the students for:

➤ Drawing engineering curves.
➤ Drawing freehand sketch of simple objects.
➤ Drawing orthographic projection of solids and section of solids.
➤ Drawing development of solids
➤ Drawing isometric and perspective projections of simple solids.

CONCEPTS AND CONVENTIONS (Not for Examination)

Importance of graphics in engineering applications - Use of drafting instruments - BIS conventions and specifications — Size, layout and folding of drawing sheets — Lettering and dimensioning.

UNIT-I   PLANE CURVES   5+12

Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNIT-II   PROJECTION OF POINTS, LINES AND PLANE SURFACE   6+12

Orthographic projection- principles-Principal Planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT-III   PROJECTION OF SOLIDS AND FREEHAND SKETCHING   6+12

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method. Visualization concepts and Free Hand sketching: Visualization principles — Representation of Three Dimensional objects — Layout of views- Freehand sketching of multiple views from pictorial views of objects.
Practicing three-dimensional modeling of simple objects by CAD Software (Not for examination)

UNIT-IV   PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES   7+12

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones.
Practicing three-dimensional modeling of simple objects by CAD Software (Not for examination)

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UNIT-V   ISOMETRIC AND PERSPECTIVE PROJECTIONS   6+12

Principles of isometric projection — isometric scale - Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method.

Practicing three-dimensional modeling of isometric projection of simple objects by CAD Software (Not for examination)

TOTAL : 90 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1: Students will be able to apply the fundamentals of BIS conventions, specifications and dimensioning rules

CO2: Construct the conic curves, involutes and cycloid.

CO3: Solve practical problems involving projection of lines.

CO4: Draw the orthographic, isometric and perspective projections of simple solids.

CO5: Draw the development of simple solids.

TEXT BOOKS:

1. K Venugopal, Engineering Drawing and Graphics, Sixth edition, New Age International, 2013.
2. Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.

REFERENCE BOOKS:

1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", McGraw Hill, 2nd Edit ion, 2019.
2. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27th Edition, 2017.
3. Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4. Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
5. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.

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E-RESOURCES:

1. https://archive.nptel.ac.in/courses/112/102/112102304/
2. https://onlinecourses.nptel.ac.in/noc20_me79/preview
3. https://www.youtube.com/watch?v=ANEvQyt3PnU

CO's – PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO2	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO3	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO4	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO5	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
Avg	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-

1 - low, 2 - medium, 3 - high, '-' - no correlation

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23MEL21	ENGINEERING PRACTICES LABORATORY	L	T	P	C
	(BE/B.Tech-Common to all Branches)	0	0	4	2

Course Objectives:
- ➢ Acquire skills in operating hand tools and instruments. Provide hands on training on common household plumbing work and wood work
- ➢ Provide hands on training on welding processes.
- ➢ Provide hands on training on various simple machining processes. Making a tray out of metal sheet using sheet metal work.
- ➢ Wiring various electrical joints in common household electrical wire network.
- ➢ Soldering and testing simple electronic circuits. Assembling and testing simple electronic components on PCB.

GROUP – A (CIVIL & MECHANICAL)

I) CIVIL ENGINEERING PRACTICES (15)

PLUMBING WORK:
a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings
b) Study of pipe connections requirements for pumps
c) Preparing plumbing line sketches
d) Hands-on-exercise:
   Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components - External thread cutting

WOOD WORK:
a) Studying joints in door panels and wooden furniture
b) Studying common industrial trusses using models
c) Hands-on-exercise:
   Sawing, Planing and Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint

II) MECHANICAL ENGINEERING PRACTICES (15)

WELDING WORK:
a) Study of arc welding, gas welding tools and equipments
b) Fabrication of Models with MS Plate using Arc Welding- Lap Joint, Butt Joint, T Joint
c) Practicing gas welding

BASIC MACHINING WORK:
a) Study of lathe and drilling machine
b) Simple Turning
c) Drilling and Tapping Practice

SHEET METAL WORK:
a) Forming & Bending
b) Model making – Trays and funnels

ASSEMBLING AND DISMANTLING WORK:
a) Assembling a centrifugal pump
b) Assembling a household mixer
c) Assembling an air conditioner

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GROUP B (ELECTRICAL & ELECTRONICS)

III) ELECTRICAL ENGINEERING PRACTICES (15)

a) Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
b) Staircase wiring
c) Fluorescent Lamp wiring with introduction to CFL and LED types.
d) Energy meter wiring and related calculations/ calibration
e) Study of Iron Box wiring and assembly
f) Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
g) Study of emergency lamp wiring/Water heater

IV) ELECTRONIC ENGINEERING PRACTICES (15)

SOLDERING WORK:
a) Soldering simple electronic circuits and checking continuity

ELECTRONIC ASSEMBLY AND TESTING WORK:
a) Assembling and testing electronic components on a small PCB

ELECTRONIC EQUIPMENT STUDY:
a) Study elements of smart phone
b) Assembly and dismantle of LED TV
c) Assembly and dismantle of computer/ laptop

TOTAL : 45 PERIODS

COURSE OUTCOMES:
At the end of the course the students will be able to

CO1:   Make a wooden model using carpentry Process.

CO2:   Make various shapes using welding processes.

CO3:   Make various shapes using manufacturing processes like machining and sheet metal work.

CO4:   Wires various electrical joints in common household electrical wire network.

CO5:   Solder and test simple electronic circuits. Assemble and test simple electronic components on PCB.

REFERENCE:

1. Manual prepared by the faculty of Civil, Mechanical, Electrical and Electronics and Communication Engineering Department, SVHEC.

CO's – PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO2	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO3	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO4	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO5	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
Avg	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1

1 - low, 2 - medium, 3 - high, '-' - no correlation

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23MET22	BASIC CIVIL AND MECHANICAL ENGINEERING	L T P C
		3 0 0 3

Course Objectives:

➢ Illustration of the significance of the Civil and Mechanical Engineering Profession in satisfying the societal needs.
➢ Acquire knowledge in the basics of surveying and the materials used for Construction.
➢ Provide an insight to the essentials of components of a building and the infrastructure facilities.
➢ Distinguish the components and working principle of IC engines.
➢ Explain the components of power plant units.

UNIT-I   OVERVIEW OF CIVIL AND MECHANICAL ENGINEERING   8

PART A: INTRODUCTION OF CIVIL ENGINEERING (4)

Civil Engineering contributions to the welfare of Society - Specialized sub disciplines in Civil Engineering – Structural, Construction, Geotechnical, Environmental, Transportation– terminologists: Plinth area, Carpet area, Floor area, Buildup area, Floor space index - Types of buildings: Residential buildings, Industrial buildings.

PART B: INTRODUCTION OF MECHANICAL ENGINEERING (4)

Overview of Mechanical Engineering - Mechanical Engineering Contributions to the welfare of Society –Specialized sub disciplines in Mechanical Engineering – Manufacturing, Automation, Automobile and Energy Engineering - Interdisciplinary concepts in Mechanical Engineering.

UNIT-II   SURVEYING AND CIVIL ENGINEERING MATERIALS   10

Surveying: Objects – Classification – Principles – Measurements of Distances and angles –Leveling – Determination of areas– Contours.
Civil Engineering Materials: Bricks – Stones – Sand – Cement – Concrete – Steel - Timber – Modern Materials, Thermal and Acoustic Insulating Materials, Decorative Panels, Water Proofing Materials. Pre-fabricated Building component (brief discussion only)

UNIT-III   BUILDING COMPONENTS AND INFRASTRUCTURE   8

Building plans – Setting out of a Building - Foundations: Types of foundations - Bearing capacity and settlement – Brick masonry – Stone Masonry – Beams – Columns – Lintels – Roofing – Flooring – Plastering. Types of Bridges and Dams – Introduction to Highways and Railways.

UNIT-IV   INTERNAL COMBUSTION ENGINES   9

Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines. Concept of hybrid engines. Industrial safety practices and protective devices.

UNIT-V   POWER PLANTS   10

Classification of Power Plants- Working principle of Steam, Diesel, Hydro-electric and Nuclear Power plants - Working principle of Boilers and Types - Turbines, Reciprocating Pumps (single acting and double acting) and Centrifugal Pumps.

TOTAL : 45 PERIODS

Chairman
BoS / Mech

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1: Understand the Civil and Mechanical Engineering components of Projects.

CO2: Summarize the planning of building, infrastructure and working of Machineries

CO3: Apply the knowledge gained in respective discipline.

CO4: Demonstrate working principles of petrol, diesel and hybrid engine.

CO5: Identify the components used in power plants.

TEXT BOOKS:

1. G Shanmugam, M S Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education; First edition, 2018.
2. K Venugopal, V.Prabhu raja, G. Sreekanjana, "Basic Civil and Mechanical Engineering" Anuradha Publications; Third Edition, 2019.
3. Anup Goel , Dipak ugale , " Basic Civil and Mechanical Engineering, Technical Publications, edition, 2019.

REFERENCE BOOKS:

1. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2018.
2. Ramamrutham S., "Basic Civil Engineering", Dhanpat Rai Publishing Co.(P) Ltd, 2013.
3. Seetharaman S., "Basic Civil Engineering", Anuradha Agencies, 2005.
4. Shantha Kumar SRJ., "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, 2000.

CO's – PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	1	-	-	2	2	1	2	-	1	-	-	-
CO2	2	-	-	-	-	-	3	2	2	2	-	2	-	-	-
CO3	2	-	-	-	-	-	3	2	2	2	-	2	-	-	-
CO4	2	-	-	-	-	-	2	2	2	2	-	2	-	-	-
CO5	2	-	-	-	-	-	2	2	2	2	-	2	-	-	-
Avg	2	-	-	1	-	-	2.4	2	1.8	2	-	1.8	-	-	-

1 - low, 2 - medium, 3 - high, '-' - no correlation

Chairman
BoS / Mech