

Basic Civil and Mechanical Engineering

(For EEE, ECE and CSE branches)

Course Code	23ES1101	Year	I	Semester	I
Course Category	Engineering Sciences	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Nil
Continuous Internal Evaluation:	30	Semester End Evaluation	70	Total Marks:	100

Part A: Basic Civil Engineering

Course Outcomes:

On completion of the course, the student should be able to:

CO1	Understand various sub-divisions of Civil Engineering and to appreciate their role in ensuring better society L2
CO2	Know the concepts of surveying and to understand the measurement of distances, angles and levels through surveying L2
CO3	Realize the importance of Transportation in nation's economy and the engineering measures related to Transportation. L2
CO4	Understand the importance of Water Storage and Conveyance Structures so that the social responsibilities of water conservation will be appreciated. L2
CO5	Understand the basic characteristics of Civil Engineering Materials and attain knowledge on prefabricated technology.L2

Contribution of course outcomes towards Achievement of Program Outcomes

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

Course Content

Unit No.	Contents	Mapped CO
I	Basics of Civil Engineering: Role of Civil Engineers in Society- Various Disciplines of Civil Engineering- Structural Engineering- Geo-technical Engineering- Transportation Engineering - Hydraulics and Water Resources Engineering - Environmental Engineering-Scope of each discipline - Building Construction and Planning- Construction Materials-Cement - Aggregate - Bricks- Cement concrete- Steel. Introduction to	CO1,5

	Prefabricated construction Techniques	
II	Surveying: Objectives of Surveying- Horizontal Measurements- Angular Measurements Introduction to Bearings Levelling instruments used for levelling -Simple problems on levelling and bearings-Contour mapping.	CO2
III	Transportation Engineering Importance of Transportation in Nation's economic development- Types of Highway Pavements- Flexible Pavements and Rigid Pavements - Simple Differences. Basics of Harbour, Tunnel, Airport, and Railway Engineering Water Resources and Environmental Engineering: Introduction, Sources of water- Quality of water- Specifications- Introduction to Hydrology- Rainwater Harvesting-Water Storage and Conveyance Structures (Simple introduction to Dams and Reservoirs).	CO3,4
Learning Resources		
Textbooks		
<ol style="list-style-type: none"> 1. M.S.Palanisamy, Tata Mcgraw Hill publications, Basic Civil Engineering, (India) Pvt. Ltd. 4th Ed. 2. S.S. Bhavikatti, New Age International Publishers. 2022, Introduction to Civil Engineering, 1st Ed. 3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, 1st Ed. 		
Reference Books		
<ol style="list-style-type: none"> 1. S.K. Duggal, Surveying, Vol- I and Vol-II, Tata McGraw Hill Publishers 2019, 5th Ed. 2. Santosh Kumar Garg, Khanna Publishers, Hydrology and Water Resources Engineering, Delhi. 2016. 3. Santosh Kumar Garg, Khanna Publishers, Delhi 2023, Irrigation Engineering and Hydraulic Structures -. 38th Ed. 4. S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchandand Brothers Publications 2019, Highway Engineering, 10th Ed. 5. Indian Standard Drinking Water — Specification IS 10500-2012. 		

Part B-Basic Mechanical Engineering

(For EEE, ECE and CSE branches)

Course Code	23ES1101	Year	I	Semester	I
Course Category	Engineering science	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Nil
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes: Upon successful completion of the course, the student will be able to

CO1	Understand regarding various engineering material, different modules of Mechanical engineering and importance of Mechanical Engineering in different sectors and industries L2
CO2	Explain different manufacturing and thermal engineering processes. L2
CO3	Describe the concepts of a power plant, mechanical power transmission elements and robotics. L2

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (H: High (3), M: Medium (2), L: Low (1))

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2				3							3	
CO2	2	2				3							3	
CO3	2	2				3							3	

Syllabus

Unit No	Content	Mapped CO
I	Introduction to Mechanical Engineering: Role of Mechanical Engineering in Industries and Society- Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors. Engineering Materials - Metals-Ferrous and Non-ferrous, Ceramics, Composites, Smart materials	CO1
II	Manufacturing Processes: Principles of Casting, Forming, joining processes, Machining, Introduction to CNC machines, 3D printing, and Smart manufacturing. Thermal Engineering – Working principle of Boilers, Otto cycle, Diesel cycle, Refrigeration and air-conditioning cycles, IC engines, 2- Stroke and 4-Stroke engines, SI/CI Engines, Components of Electric and Hybrid Vehicles.	CO1,2

III	<p>Power plants – Working principle of Steam, Diesel, Hydro, Nuclearpower plants.</p> <p>Mechanical Power Transmission - Belt Drives, Chain, Rope drives, Gear Drives and their applications.</p> <p>Introduction to Robotics - Joints & links, configurations, and applications of robotics.</p>	CO1,3
Learning Resources		
Text Books		
<ol style="list-style-type: none"> 1. V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd., Internal Combustion Engineers 2. S.S. Rattan, A text book of Theory of Machines by Tata McGraw Hill Publications, (India) Pvt. Ltd. 3. Jonathan Wicker and Kemper Lewis, An introduction to Mechanical Engg by Cengage learning India Pvt. Ltd. 		
Reference books		
<ol style="list-style-type: none"> 1. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, TataMcGraw Hill publications (India) Pvt. Ltd. 2. Mahesh M Rathore, Thermal Engineering by Tata McGraw Hill publications (India) Pvt.Ltd. 3. L. Jyothish Kumar, Pulak M Pandey, 3D printing & Additive Manufacturing Technology- Springer publications. 		