

UNIT - 7

Bending Of Beams: Analysis for stresses, Non linear stress strain curve, shear stress distribution, residual stresses in plastic bending, problems.

06 Hours

UNIT - 8

Torsion Of Bars: Introduction, plastic torsion of a circular bar, elastic perfectly plastic material, elastic work hardening of material, residual stresses and problems

06 Hours

TEXT BOOKS:

1. 'Theory of Plasticity', Chakraborty 3rd Edition Elsevier.
2. 'Engineering Plasticity', W. Johnson and P. B. Mellor D Van N.O Strand Co. Ltd 2000

REFERENCE BOOKS:

1. **Basic Engineering Plasticity**, DWA Rees 1st Edition Elsevier.
2. **Theory of Plasticity**, L. S. Srinath TMH,
3. **Theory of Plasticity**, Sadhu Singh, Kanna publisher

ENGINEERING DESIGN

Subject Code	: 10ME753	IA Marks	: 25
Hours/Week	: 04	Exam Hours	: 03
Total Hours	: 52	Exam Marks	: 100

PART – A

UNIT-1

Identifying Customer Needs, Gather raw data from customers, Interpret raw data in terms of customer needs, Organize the needs into a hierarchy, Establish the relative importance of the needs, Reflect on the results and the process.

06 Hours

UNIT -2

The Design Process: Introduction, The design process, The design process steps, A detailed morphology of design, Further considerations in design, Spectrum of engineering activities, Organization of the engineering function,

The product life cycle, Technological forecasting and innovation, Market identification, Competitive benchmarking ,Human factors in design

07 Hours

UNIT-3

Design Methods: Introduction, Creativity and problem solving, Creativity methods, The problem statement, Product design specifications, Concept selection technique, Methods of conceptual design, Design principles, Decision theory, Evaluating alternatives, Decision trees.

07 Hours

UNIT-4

Modeling and Simulation: Role of models in design, Mathematical modeling, Similitude and scale models, Simulation, Geometric modeling.

06 Hours

PART – B

UNIT-5

Human Engineering Consideration: Introduction, Human being as applicator of forces, Anthropometry, The design of controls, Design of displays, Man/Machine information exchange.

07 Hours

UNIT-6

Risk and Reliability: Probabilistic approach to design, Reliability theory, Design for reliability, Hazard analysis, Bath tub curve, Mean life, MTTF and MTBF, Exponential and Weibull distribution, series and parallel configuration, Combination of series and parallel configuration Fault tree analysis.

07 Hours

UNIT-7

Material Selection: Performance characteristics of materials, Material selection process, Sources of information on materials, Economics of materials, Methods of material selection, cost verses performance relations, weighted property index, Value analysis.

06 Hours

UNIT-8

Robust Design: What is robust design, Identify control factors, Noise factors, Formulate an objective function, Develop the experimental plan, Run the experimental plan, Conduct the analysis, Select and confirm factor set points, Reflect and repeat.

06 Hours

TEXT BOOKS:

1. **Engineering Design : A Materials and Processing Approach**, George E. Dieter, 4th Ed., Mc. Graw Hill Company, Newyork
2. **Product Design and Development**. T. Ulrich. and S. D. Eppinger, Tata Mc Graw Hill -2003

REFERENCE BOOKS:

1. **The Mechanical Design Process**, D., G. Ullman. 4th Ed., International Edition, 1992.
2. **Product Design and Manufacturing**, A. K. Chitale, R. C. Gupta, PHI, 2nd Ed – 2002.

NON-CONVENTIONAL ENERGY SOURCES

Subject Code	: 10ME754	IA Marks	: 25
Hours/Week	: 04	Exam Hours	: 03
Total Hours	: 52	Exam Marks	: 100

PART A

UNIT – 1

Introduction : Energy source, India's production and reserves of commercial energy sources, need for non-conventional energy sources, energy alternatives, solar, thermal, photovoltaic. Water power, wind biomass, ocean temperature difference, tidal and waves, geothermal, tarsands and oil shale, nuclear (Brief descriptions); advantages and disadvantages, comparison (Qualitative and Quantitative).

6 Hours