

SHRI VENKATESHWARA UNIVERSITY



Syllabus

B.TECH
Civil Engineering
VIIth SEMESTER
(Four Years Degree Programme)

(w.e.f. 2019-20)

**SCHOOL OF ENGINEERING &
TECHNOLOGY**

Civil Engineering

SEMESTER-VII

Sl. No	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	SCE-701	Design of Steel Structures	3	0	0	20	10	30		70		100	3
2	SCE-702	Tunnel Engineering	3	0	0	20	10	30		70		100	3
3	SOE-071	Introduction to Industrial Management	3	0	0	20	10	30		70		100	3
4	SCE-711	Project-I	0	0	12					50	50	100	6
5	SCE-777	Summer Internship								100		100	3
		Total										500	18

Summer Internship after VI sem

SCE-701 DESIGN OF STEEL STRUCTURES

Objectives:

1. To introduce to students the theory and application of analysis and design of steel structures.
2. To develop students with an understanding of the behavior and design of steel members and systems.
3. To prepare students for the effective use of the latest industry standard formulas, tables, design aids and computer software in the design of steel members.

Outcomes:

Upon completion of this course, students should be able to:

1. recognize the manufacturing process and the material properties of steel products.
2. recognize the design philosophy of steel structures and have concept on limit state design.
3. understand the behaviour of steel structures, in particular the various forms of failure for members and connections under tension, compression, bending and combined actions.
4. apply the principles, procedures and current code requirements to the analysis and design of steel tension members, beams, columns, beam-columns and connections.
5. ability to follow different structural design specifications and apply computer software to analyze steel structural systems under gravity and lateral loads.

S.N.	Unit number	Topics	Sub Topics
1	1	General Considerations	Introduction, Advantages of Steel as a Structural. Material, Disadvantages of Steel as a Structural Material, Structural Steel, Stress-Strain Curve for Mild Steel, Rolled Steel Sections, Convention for Member Axes, Loads, Dead Load, Live Loads, Environmental Loads, Seismic Forces, Snow and Rain Loads, Erection Loads, Basis for Design, Design Philosophies, Local Buckling of Plate Elements.
2	2	Simple Connections	Introduction, Limit States for Steel Design, Limit States of Strength, Limit States of Serviceability, Actions(Loads), Probabilistic Basis for Design, Design Criteria.
		Riveted, Bolted and	Introduction, Riveted Connections, Patterns of Riveted Joints, Bolted Connections, Types of Bolts, Types of Bolted Joints, Load Transfer

3	3	Pinned Connections	Mechanism, Failure of Bolted Joints, Specification for Bolted Joints, Bearing Type Connections, Prying Action, Tensile Strength of Plate, Efficiency of the Joint, Combined Shear and Tension, Slip-Critical Connections, Combined Shear and Tension for Slip-Critical Connections, Working Load Design, Pin Connections
4	4	Simple Welded Connections	Introduction, Types, Symbols, Welding Process, Weld Defects, Inspection of Welds, Assumptions in the Analysis of Welded Joints, Design of Groove Welds, Design of Fillet Welds, Fillet Weld Applied to the Edge of A Plate Or Section, Fillet Weld for Truss Members, Design of Intermittent Fillet Welds, Plug and Slot Welds, Stresses Due To Individual Forces, Combination of Stresses, Failure of Welds, Distortion of Welded Parts, Fillet Weld Vs Butt Weld, Welded Jointed Vs Bolted and Riveted Joints, Section of Fasteners, Working Load Design.
5	5	Tension Members	Introduction, Types of Tension Members, Net Sectional Area, Effective Net Area, Types of Failure, Design Strength of Tension Members, Slenderness Ratio (λ), Displacement, Design of Tension Member, Lug Angles, Splices, Gusset Plate, Working Load Design.
		Compression Members	Introduction, Effective Length, Slenderness Ratio (λ), Types of Sections, Types of Buckling, Classification of Cross Sections, Column Formula, Design Strength, Design of Axially Loaded Compression Members, Built-Up Columns (Latticed Columns), Lacing, Batten, Compression Member Composed of Two Components Back-to-Back, Encased Column, Splices, Design of Column Bases.
		Beams	Introduction, Types of Sections, Behaviour of Beam in Flexure, Section Classification, Lateral Stability of Beams, Lateral-Torsional Buckling, Bending Strength of Beams, Laterally Supported Beams, Laterally Unsupported Beams, Shear Strength of Beams, Web Buckling, Bearing Strength, Web Crippling, Deflection, Design Procedure of Rolled Beams, Built-Up Beams (Plated Beams), Lintels, Purlins, Beam Bearing Plates, Castellated Beam, Effect of Holes in Beam, Introduction to Plate Girder, Introduction to Gantry Girder.

Text Books

1. Limit State Design of Steel Structures by S. K. Duggal, Tata Mcgraw Hill.
2. Design of Steel Structures by K S Sairam, Pearson Education

SCE-702 TUNNEL ENGINEERING

Objectives:

1. Tunnel engineering is one of the important aspects of civil engineering.
2. Civil engineer has to play a vital role in the design and construction of railway track and other associated structures for safe and efficient movement of the trains.
3. All the three aspects have been dealt with extreme care, especially the tunnel engineering on which limited reference is available.

Outcomes:

1. The students will gain an experience in the implementation of Railway, Bridge and Tunnel Engineering on engineering concepts which are applied in field of Transportation Engineering.
2. The students will get a diverse knowledge of Railway, Bridge and Tunnel engineering practices applied to real life problems.
3. The students will learn to understand the theoretical and practical aspects of Railway, Bridge and Tunnel engineering along with the design and management applications.

S.N.	Unit number	Topics	Sub Topics
1	1	Site investigations	Site investigations , Geotechnical Considerations of tunneling
2	2	Design of Tunnels	Design of Tunnels
3	3	Excavation methods	Construction & Excavation methods , soft ground tunnels , Rock tunnels
4	4	Micro techniques	Micro tunneling techniques , Tunnel support design
5	5	Ventilation of tunnels	Ventilation of tunnels , tunnel utilities , safety aspects

Books :

1. Tunnel Engineering Handbook by J O Bickel & T R Kuesel
2. Rock Mechanics Design in Mining & Tunneling by Z T Bieniawski

SOE-071

INTRODUCTION TO INDUSTRIAL MANAGEMENT

Unit I

Introduction: Concept and scope of Industrial Management. Productivity: Definition, measurement, productivity index, types of production system, Industrial Ownership.

Unit II

Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Social responsibilities of Management, Introduction to Human resources management: Nature of HRM, functions and importance of HRM.

Unit III

Work Study: Introduction, definition, objectives, steps in work study, Method study: definition, objectives, steps of method study, Work Measurement: purpose, types of study — stop watch methods — steps — allowances — standard time calculations — work sampling, Production Planning and Control Inventory Control: Inventory, Cost, Models of inventory control: EOQ, ABC, VED.

Unit IV

Quality Control: statistical quality control, Control charts for variables and attributes, Acceptance Sampling- Single sampling- Double sampling plans, Introduction to TQM.

Unit V

Project Management: Project network analysis, CPM, PERT and Project crashing and resource Leveling.

References:

1. Engineering Management (Industrial Engineering & Management)/ S.C. Sharma & T.R. Banga, Khanna Book Publishing Co. (P) Ltd., Delhi (ISBN: 978-93-86173-072)
2. Industrial Engineering and Management/ P. Khanna, Dhanpatrai publications Ltd.
3. Production & Operation Management /PaneerSelvam /PHI.

4. Industrial Engineering Management/NVS Raju/Cengage Learning.
5. Industrial Engineering Management I RaviShankar/ Galgotia