

STRUCTURAL DESIGN LABORATORY

II Semester: ST								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BSTC23	Core	L	T	P	C	CIA	SEE	Total
		0	0	4	2	30	70	100
Contact Classes: Nil		Total Tutorials: Nil		Total Practical Classes: 36		Total Classes: 36		
I. COURSE OVERVIEW:								
<p>Structural Design Laboratory will summarize the key engineering, operational, safety, and sustainability considerations for the design of RC framed buildings. Introduces the design and behavior of large-scale structures and structural materials. This course Emphasizes the development of structural form and the principles of structural design. This Laboratory used to solve structural problems by building and testing simple mathematical models. STAADPro is one of the most widely used structural analysis and design software products worldwide. It can be used for analysis and design of all types of structural projects from buildings, bridges to towers, tunnels, metro stations, water/wastewater treatment plants and more.</p>								
II. COURSE OBJECTIVES:								
The student will try to learn:								
<ol style="list-style-type: none"> I. The basic elements with different loading type and supports with the aid of STAAD Pro software. II. The Analysis and design of 2D Frame and multi-storey buildings with different load sets. III. The Modeling and analysis of steel structures like beams and columns. 								
III. COURSE OUTCOMES:								
After successful completion of the course, students should be able to:								
CO 1	Explain the basic commands of STADD Pro software for analysis and design of structural elements.					Understand		
CO 2	Analyse the trusses subjected to different loading conditions using indian standard specifications.					Analyse		
CO 3	Analyse the rigid jointed frames subjected to different loading conditions using indian standard specifications.					Analyse		
CO 4	Design of steel 2D and 3D trusses for industrial and bridge structures.					Analyse		
CO 5	Design of reinforced concrete rigid frames for multistoried structures.					Analyse		
CO 6	Make use of latest tools for analysis and design of sub-structures					Apply		
IV. SYLLABUS:								
Week-I: INTRODUCTION TO STAAD SOFTWARE								
Introduction								
Week-II: STRUCTURAL SYSTEMS								
General Description-Type of structure, Unit systems, structure geometry and Co-ordinate systems.								

Week-III: COMMAND INPUTS

STAAD Pro –Commands- Using Edit Input-Command Formats-Text Input.

Week-IV: DEVELOPING GEOMETRY AND DIMENSIONING

Pre- Graphical Input Generation-Library- Geometry Generation – Dimensioning in STAAD Pro.

Week-V: 3D MODEL DEVELOPMENT

Post – Graphical Post Processing – Animation – Icons – Isometric View – Zooming-Results of Analysis & Design – Query reports in STAAD Pro.

Week-VI: ASSIGNING DIFFERENT LOAD PARAMETERS

LOAD – Member Load, Element Load, Joint Load, Floor Load, Self-weight Command, Load case no, Load Combination.

Week-VII: ANALYSIS OF BEAM AND TRUSS

Analysis of 2D Truss using STAAD Pro.

Analysis of continuous Beams using STAAD Pro.

Week-VIII: ANALYSIS OF RIGID FRAMES

Analysis of 2D and 3D Rigid Frames using STAAD Pro.

Week-IX: DESIGN OF RC STRUCTURAL ELEMENTS

Design of RC framed structures (Beams, columns, slabs, footings) using STAAD Pro

Design of circular water tanks using STAAD Pro.

Week-X: ANALYSIS AND DESIGN OF STEEL STRUCTURES

Analysis and Design of steel structures (Beams, columns).

V.TEXT BOOKS:

1. T.S.Sarma, “Staad.Pro v8i for beginners” Notion press, 2014.
2. SivakumarNaganathan, “Learn Yourself Staad Pro V8i”, Lap Lambert Academic Publishing GmbH KG, 2012.

VI.REFERENCE BOOKS:

1. Subramanian N., “Design of Steel Structures”, Oxford Publication, 4th Edition, 2008.

VII. Web References:

1. https://onlinecourses.nptel.ac.in/noc17_ce21/preview.

VIII. E-Text Books:

1. <https://civildigital.com/staad-pro-v8i-video-tutorials/>.