INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

STRUCTURAL DESIGN LABORATORY							
II Semester: ST							
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**	

Course Code	**Category**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
BSTD23	Core	0	0	4	2	40	60	100

Contact Classes: Nil	**Total Tutorials: Nil**	**Total Practical Classes: 36**	**Total Classes: 36**

Prerequisite: Advanced Structural Design Laboratory

I. COURSE OVERVIEW:

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. STAAD.Pro 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.

II. COURSE OBJECTIVES:

The student will try to learn:

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.

CO 2 Analyse the trusses subjected to different loading conditions using Indian standard specifications.

CO 3 Analyse the rigid jointed frames subjected to different loading conditions using Indian standard specifications.

CO 4 Design of steel 2D and 3D trusses for industrial and bridge structures.

CO 5 Design of reinforced concrete rigid frames for multistoried structures.

CO 6 Make use of latest tools for analysis and design of sub-structures

IV. COURSE CONTENT:

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: ANALYIS OF BEAM AND TRUSS
Analysis of 2D Truss using STAAD Pro.
Analysis of continuous Beams using STAAD Pro.

Week-VIII: ANALYIS 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. Siva kumar Naganathan, "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. ELECTRONICS RESOURCES:
1. https://onlinecourses.nptel.ac.in/noc17_ce21/preview.
2. https://civildigital.com/staad-pro-v8i-video-tutorials/.

VIII. MATERIALS ONLINE:
1. Course Template
2. Tutorial Question Bank
3. Assignments
4. Model Question Paper – I
5. Model Question Paper - II
6. Lecture Notes
7. Power point presentation