

Asian Institute of Technology
School of Engineering and Technology

Design of Tall Buildings

Semester: August

Course Objective: This course aims to introduce the engineers with the need and recent developments in tall buildings design, and various systems which co-exist and operate together in a tall building to fulfill its intended function. These systems not only include structural systems but also Architectural, Mechanical, Plumbing, HVAC and Elevator Systems. Another objective of this course is to expose the engineers to developments in structural modeling and analysis of tall buildings. The course content has been set/designed keeping in view the overall design process involved in a typical high-rise building project.

Learning Outcomes: The students on the completion of this course would be able to:

- Ability to design the structural system of tall buildings, component, or process and assess compliance with customary standards of practice, users and project's needs, and relevant constraints.
- Ability to use the techniques, skills and modern engineering tools in structural design to solve design problems.

Course Outline:

- I Background
 - 1. Need for tall buildings
 - 2. Development of tall building

- II Overview of Tall Buildings Systems
 - 1. Various systems in tall buildings
 - 2. Structural systems for tall buildings
 - 3. Professional involved

- III Conceptual Design and Preliminary Design of Tall Buildings
 - 1. Preliminary Design of Tall Buildings
 - 2. Gravity load-resisting system
 - 3. Lateral load-resisting system
 - 4. Floor diaphragm systems
 - 5. Selection of Structural Systems

- IV Structural Modeling and Analysis of Tall Buildings
 - 1. Progression of design philosophies
 - 2. Design process
 - 3. Design criteria
 - 4. Structural modeling and characteristics of the structure
 - 5. Structural behavior and analysis for gravity loads
 - 6. Structural behavior and analysis for lateral loads

Learning Resources:

Textbooks: No designated textbook, Lecture notes will be provided by the instructor.

Reference Books:

1. Tall Buildings – A Strategic Design Guide (2016), Editors: Nigel Clark and Bill Price, Publisher: BCO, CTBUH, ISBN13: 9781859466186
2. Tall and Supertall Buildings: Planning and Design (2014), Editor: Akbar Tamboli, Publisher: McGraw-Hill Professional, with CTBUH and ICC, ISBN13: 978-0071818711 ISBN: 0071818715
3. The Tall Buildings Reference Book (2013), Editor: David Parker and Antony Wood, Publisher: Routledge, ISBN13: 978-0415780414 ISBN: 0415780411
4. T.Y. Lin and S.D. Stotesbury (1988): Structural Concepts and Systems for Architects and Engineers, 2nd edition, Van Nostrand Reinhold.
5. D.L. Schodek (1998): Structures, 3rd edition, Prentice Hall, Inc.
6. Council on Tall Buildings and Urban-Habitat, (2008): Recommendations for the Seismic Design of High-Rise Buildings.
7. Graham H. Powell (2010): Modeling for Structural Analysis, Computers & Structures Inc.
8. Edward L. Wilson (2000): Three-Dimensional Static and Dynamic Analysis of Structures, Computers & Structures Inc.

Journals and Magazines:

1. Structural Engineering International Journal, IABSE
2. The Structural Design of Tall and Special Buildings, John Wiley & Sons, Ltd
3. Engineering Structures, Elsevier Science ltd
4. Journal of Structural Engineering, ASCE.
5. ACI Structural Journal, ACI

Teaching and Learning Methods:

The teaching and learning method involves two ways as mentioned below:

Online Component:

- Study materials (presentations, videos, journal articles, etc.) through an online system
- Interactive medium of communication with faculty, professional engineers and other students through chat
- Weekly group/individual assignments

In-class Component:

- Class lectures, Discussion with faculty

Instructor:

Dr. Naveed Anwar
Vice President for Knowledge Transfer, AIT
Affiliated Faculty, Structural Engineering
Director, ACECOMS

Engr. Thaung Htut Aung
Director, AIT Solutions

Dr. Pramin Norachan
Structural Engineering Manager
AIT Solutions

