

Faculty of Engineering & Technology

Building Construction & Materials 3

Information :

Course Code : ARC 341

Level : Undergraduate

Course Hours : 4.00- Hours

Department : Department of Architectural Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Hala Ali Nabil Mohamed Ali	2
Teaching Assistant	Omar Magdy Ahmed Ibrahim Elbahrawy	
Teaching Assistant	Kamal Abdeleziz Ali Selim	1
Teaching Assistant	Salma Mohamed Eltohamy Elgendy	1

Area Of Study :

Upon successful completion of the course, the student should be able to:

- ✓ Know the main types of advanced constructions with large spans and high rise structures.
- ✓ Know the theory of transferring loads in large spans and high rise structures.
- ✓ Know the different materials appropriate for executing large spans and high rise structures
- ✓ Draw different working details for large spans and high rise structures

Description :

The main concern and focus of this course will be about the advanced construction systems and execution methods. The course will cover the basics of designing and executing buildings with large span and high rise buildings; mainly the steel and wood trusses and frames. Also the course will comprise the design and execution details of space trusses, geodesic domes, tents, tension and shell structures.

Course outcomes :

a. Knowledge and Understanding: :

1 -	List the main types of advanced constructions with large spans.
2 -	List the main types of advanced constructions with high rise.
3 -	Illustrate how life/dead loads are transferred through different structure systems with large span.
4 -	Illustrate how life/dead loads are transferred through different structure systems with high rise.
5 -	List different materials appropriate for executing large spans constructions.
6 -	List different materials appropriate for executing high rise constructions.
7 -	Identify different ways of modelling and presenting structure systems.

b. Intellectual Skills: :

1 -	Differentiate between diverse types of large span structures considering optimum covered span and resulting form.
2 -	Differentiate between diverse types of high rise structures considering resulting form and plan, also the maximum rise.

3 -	Select proper structural system according to the building needs and function.
4 -	Deduce the structure system that is used in a given complete project.

c. Professional and Practical Skills: :

1 -	Design appropriate structure system for various constructional cases that include large span or high rise structures.
2 -	Use freehand sketches and engineering drafting to draw building construction details
3 -	Design appropriate details for various constructional cases that include large span or high rise structures.
4 -	Build architectural physical models for different construction ways for large spans and high rise constructions.

d. General and Transferable Skills: :

1 -	Manage tasks and resources
2 -	Search for information
3 -	Refer to relevant literature.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction	6	2	4
Linear structures (vector-active): steel trusses	6	2	4
Linear structures (Section-active): steel frames	6	2	4
Wooden trusses and frames	6	2	4
space structures(Surface-active): steel space trusses	6	2	4
space structures(Surface-active): Geodesic Domes	6	2	4
space structures(Form-active): Cable structures	6	2	4
space structures(Form-active): Tent structures	6	2	4
Shell structures(Form-active): Folded Roofs	6	2	4
Shell structures(Form-active): shell structures , double curvature	6	2	4
Hybrid Structures	6	2	4
High rise buildings systems	4	0	4
High rise buildings systems	4	0	4
High rise buildings systems	4	0	4
Revision	6	6	0

Teaching And Learning Methodologies :

Lectures.
Research (self-study)
Class Work

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments/Studio work	30.00		

Final exam	40.00		
In Class Quizzes	10.00		
Participation	10.00		
Self-study	10.00		

Course Notes :

No course notes are required

Recommended books :

- a) Ching, Francis D. K.; Building Construction Illustration, Willey4th Ed.
- b) Mckay's, W. B. et ell; Building Construction, v. I
- c) Ramsey, Sleeper; Architectural graphic standards, American Institute of Architects and Dennis J. Hall
- d) Mitchell, George A.; Building Construction. V. I
- * Allen, E., & Iano, J. (2004). Fundamentals of Building Construction: Materials and Methods. Hoboken, N.J.: Wiley.
- * Architectural Magazines and Projects

Periodicals :

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Web Sites :

- * U.S. Department of Justice, Americans with Disabilities Act (ADA): www.ada.gov
- Construction Standards and Information Resources * American National Standards Institute (ANSI): www.ansi.org *
- ASTM International: www.astm.org * Canadian Standards Association (CSA): www.csa.ca * Construction Specifications Canada (CSC): www.csc-dcc.ca * Construction Specifications Institute (CSI): www.csinet.org * National Institute of Building Sciences (NIBS): www.nibs.org
- * National Research Council Canada, Institute for Research in Construction (NRC-IRC): nrc-cnrc.gc.ca