

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 :

Develop the students' knowledge about the main types of advanced constructions with large spans and high rise structures.

Develop the students' knowledge of the theory of transferring loads in large spans and high rise structures.

Develop the students' knowledge of the different materials appropriate for executing large spans and high rise structures

Train the students to 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: :

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

b.Intellectual Skills: :

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

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| 3 - | Selecting 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: :

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| 1 - | Designing appropriate structure system for various constructional cases that include large span or high rise structures. |
| 2 - | Using freehand sketches and engineering drafting to draw building construction details |
| 3 - | Designing 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: :

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

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 (research submission & discussion) | 6 | 0 | 6 |
| High rise buildings systems (research submission & discussion) + sum up lecture | 6 | 2 | 4 |
| Revision | 6 | 4 | 2 |

Teaching And Learning Methodologies :

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| Interactive lecture |
| Research (self-study) |
| Class Work |

Course Assessment :

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

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|---------------|-------|--|--|
| Final exam | 40.00 | | |
| Midterm exam | 10.00 | | |
| Participation | 10.00 | | |
| Self-study | 10.00 | | |

Recommended books :

- a) Ching, Francis D. K.; Building Construction Illustration, 4th Ed- 2008
- b) Mckay's, W. B. et ell; Building Construction, v. I- 2012
- c) Ramsey, Sleeper; Architectural graphic standards - 201

Periodicals :

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Web Sites :

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