1. Basic Information

Program Tile	Architectural Engineering
Department offering the Program	Architectural Engineering
Department Responsible for the Course	Architectural Engineering
Course Title	Elective 03 – Advanced Structural Systems
Course Code	ARE7326
Year/ Level	Third Year – Second Term
Specialization	Major
Authorization date of course specification	2005

Teaching Hours	Lectures	Tutorial	Practical
	2	2	0

2. Course Attributes:

No.	Attribute
05.	Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.
08.	Consider the impacts of engineering solutions on society & environment.
15.	Demonstrate knowledge of cultural diversity, differences and the impact of a building on community character and identity.

3. Intended Learning Outcomes (ILOs):

a. Knowledge and Understanding:

No.	Knowledge and Understanding
A06.	Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.
A08.	Current engineering technologies as related to disciplines.
A15.	Fundamentals of building acquisition, operational costs, and of preparing construction documents and specifications of materials, components, and systems appropriate to the building.
A21.	The role of the architecture profession relative to the construction industry and the overlapping interests of organizations representing the built environment.

b. Intellectual Skills

No.	Intellectual Skills
B04.	Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
B12.	Create systematic and methodic approaches when dealing with new and advancing technology.
B15.	Predict possible consequences, by- products and assess expected performance of design alternatives.
B20.	Discuss, search and formulate informed opinions appropriate to specific context and

	circumstances affecting architecture profession & practice.

c. Professional Skills

No.	Professional Skills
C15.	Use appropriate construction techniques and materials to specify and implement different designs.
C16.	Participate professionally in managing construction processes.
C21.	Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.

d. General Skills

No.	General Skills
D01.	Collaborate effectively within multidisciplinary team.
D04.	Demonstrate efficient IT capabilities.
D06.	Manage tasks and resources efficiently.
D09.	Refer to relevant literature effectively.

4. Course Contents:

No.	Topics
1	Introduction and course orientation.
2	Arches/Vaults/Domes' structures.
3	Frames/Space Frames' structures.
4	Trusses/Space Trusses' structures.
5	Folded structures.
6	Shell structures.
7	Tensile structures.
8	Midterm Exam.
9	Pneumatic.
10	Vierendeel.
11	Hyperbolic.
12	Tall Buildings and Skyscrapers.
13	Tall Buildings and Skyscrapers.
14	Reviews and Discussion.

5. Teaching and Learning Methods:

5.1 Normal Students:

No.	Teaching Method	Choice
1	Lectures	√
2	Discussion Sessions	√
3	Information Collection from Different Sources	×
4	Practical	×

5	Research Assignment	√
6	Field Visits	√
7	Case Studies	×
8	Smart Sessions	√

5.2 Disable Students:

No.	Teaching Method	Reason
1	Presentation of the course in digital material.	Better access any time.
2	Web communication with students	Better communication with certain cases.
3	Asking small groups to do assignments; each composed of low, medium, and high performance students.	Knowledge and skills transfer among different levels of students.
4	Asking disabled students to do PowerPoint/Poster presentations.	Encouraging disabled students' engagement and interaction.

5.3 Excellent Students:

No.	Teaching Method	Reason
1	Developing course materials gradually to allow excellent students to receive teaching that meets their needs	Excellent students rely on excellent teaching
2	Encouraging students to participate in competitions with rewarded bonus marks.	Increasing excellent students' competitiveness

6. Student Assessment:

6.1 Student Assessment Methods:

No.	Assessment Method	Choice	ILOs
1	Mid Term Examination	√	A06, A08, A15, A23, B04, B12, B15, B20, D01, D03, D06, D09.
2	Oral Examination	×	-
3	Practical Examination	×	-
4	Semester work	√	A06, A08, A15, A23, B15, B20, D01, D03, D06, D09.
5	Other types of assessment	×	-
6	Final Term Examination	√	A06, A08, A15, A23, B15, B20, C15, C16, C21, C22.

6.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	08th

2	Oral Examination	×
3	Practical Examination	×
4	Semester work	2^{nd} -7^{th} ; 09^{th} – 14^{th}
5	Other types of assessment	×
6	Final Term Examination	15^{th}

6.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	10%
2	Oral Examination	-
3	Practical Examination	-
4	Semester work	20%
5	Other types of assessment	-
6	Final Term Examination	70%
Total		100%

7. List of References

No.	Reference List
1	Brian Edwards, Towards Sustainable Architecture, 1997.
2	Chilton, John, Space frame structures – Design and construction, 2000.
3	Andrew W. Charleson, Structure as Architecture: A Source Book for Architects and Engineers, 2005.

8. Facilities Required for Teaching and Learning:

No.	Facility	Choice
1	Lecture Classroom	√
2	Lab Facilities	×
3	White Board	√
4	Data Show System	√
5	Visualizer	×
6	Smart Board	√

No.	Facility	Choice
7	Wireless Board	×
8	Presenter	×
9	Sound System	√
10	Wire-Internet	×
11	Wireless Internet	√
12	…	-

9. Matrix of Knowledge and Skills of the Course:

No.	Topic	Attributes	Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
1	Introduction and course orientation.	05	A_{06}	-	-	-
2	Arches/Vaults/Domes' structures	05	A_{06}	-	-	-
3	Frames/Space Frames' structures	05	A_{06}, A_{08}	-	C_{15}	-
4	Trusses/Space Trusses' structures	05	A_{06}, A_{08}	-	C_{15}	-

5	Folded structures	08	-	B_{04}, B_{12}, B_{15}, B_{20}	$C_{16,}$ C_{21}	-
6	Shell structures	08	-	B_{04}, B_{12}, B_{15}, B_{20}	C_{16}, C_{21}	-
7	Tensile structures	08	-	B_{15}, B_{20}	C_{21}	-
8	Midterm Exam	05, 08	A_{15}, A_{23}	B_{15}, B_{20}	C_{21}	-
9	Pneumatic	08	A_{23}	B_{15}, B_{20}	C_{21}	-
10	Vierendeel	08	A_{23}	B_{15}, B_{20}	C_{21}	-
11	Hyperbolic	15	A_{23}	B_{15}, B_{20}	C_{21}	-
12	Tall Buildings and Skyscrapers	15	-	B_{20}	C_{21}	D_{01}, D_{04}, D_{06}, D_{09}
13	Tall Buildings and Skyscrapers	15	-	B_{20}	C_{21}	D_{01}, D_{04}, D_{06}, D_{09}
14	Reviews and Discussion	05, 08, 15	-	B_{20}	C_{21}	D_{01}, D_{04}, D_{06}, D_{09}

Course Coordinator: **Associate Professor Dr. Sherif Ahmed Ali Sheta**

Head of Department: **Professor Dr. Mohammad Mohammad Taha Al-Azab**

Date of Approval: