

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

KING SAUID UNIVERSITY
COLLEGE OF ARCHITECTURE AND PLANNING
DEPARTMENT OF ARCHITECTURE & BUILDING SCIENCES
COURSE : **Arch 487**

NEW CONSTRUCTION TECHNIQUES IN BUILDINGS
INSTRUCTOR : DR. MANSOUR A. AL-JADEED

OBJECTIVE:

The main objective of this course is to have the students understand new construction techniques, and study manufacturing, assembling and construction processes as a whole. The student also review significant building production techniques and industrialized building systems used in Saudi Arabia and abroad.

CONTENTS AND METHOD:

The course will chiefly cover a series of lecture, several visits to private manufacturers of new building production systems in Riyadh, and preparation, presentation and discussion of field works reports.

LECTURES:

The lectures will be given by the instructor are intended to review the new construction techniques. The main subjects will be as follows:

A. Introduction:

- 1 . Evolution of the Saudi Building Industry.
- 2 . Evolution of Building products in the Country.

B. Improved Traditional and Conventional Building Systems:

- 1 . New clay and concrete bricks and blocks.
- 2 . Gypsum materials and components.
- 3 . Timber boards.
- 4 . Composites (such as GRC & GRP).
- 5 . Lightweight material for thermal and sound insulation

C. Innovations Cast-in-situ Concrete Systems:

1. Advantages and disadvantages of cast-in-place concrete.
2. Development of the basic materials.
3. Development in the surface finishes of concrete.
4. Innovations in formwork (Slip, Flying and Climbing forms).

5. Tilt-up construction system.
6. Life-slab construction system.

D. Partial Prefabrication:

1. Building systems with prefabricated walls.
2. Building systems with prefabricated floors.
3. Monolite construction system.
4. prefabricated service units (bathrooms, kitchens, ...).
5. prefabricated components (stairs, windows with surrounds)
6. Factory fabrication of subsystems and heavy modules.

E. Pre-cast Concrete systems:

1. Advantages and disadvantages of precast concrete.
2. Precast concrete structural elements.
3. Assembly concepts for precast concrete buildings.
4. The manufacture of precast concrete structural elements.
5. Jointing precast concrete elements.
6. Prestressed concrete (principle, materials, methods and uses).

GRADING CRITERIA:

Final grade of each student will be determined according to the following criteria:

1. Rate of Attendance (lectures & visits)*	10%
2. Mid-Term Examination	20% **
3. Field Work Report.	20%
4. Final Examination	50%
	100%

REFERENCES:

1. S. Berkoz, s. Saeed, M. al-Hussayen An Analytical study of the building production Systems Recently Introduced in Saudi Arabia. King Abdul Aziz City for Science & Technology, Riyadh, 1409A.H / 1989A.D.
2. J.Foster. Structure and Fabric. B.T .Batasford Ltd., London, 1979.
3. E. Allen. Fundamentals of Building Construction . John Wiley & Sons, Inc., USA, 1990.
4. J. Illingworth. Construction Methods and planning. E & FN Spon, London, 1994.
5. C. Barritt. Advanced Building Construction, Volume 1 & 2. Longman, London, 1984.
6. E. Ehrenkrantz. Architectural Systems. McGraw-Hill Publishing Co., USA, 1989.

*NOTE: According to the regulations of king saud University, students whose absentees from the course (lectures and visit) exceed 25% will not be allowed sit for the final examination.

7. T. Schmid & C. Testa. System Building. Les Editions d Architecture, Artemis, Zurich, 1969.
8. A Webster. Technological Advance in Japanese Building Design And Construction ASCE Press , New York, 1994.
9. N. Shilling. Prefabricated Housing in the arab Wold. Inter-Crescent Pub. Co Dallas, 1978.
10. M. Levitt. Precast Concrete: Materials, Manufacture, Properties and Usage. Applied.
11. J. Strike. Construction into Design: The Influence of New Methods of Construction on Architectural Design 1690-1990. Butterworth Architecture, Oxford, 1991.