* University of Salahaddin
* College of Engineering
* Department of Architecture
* 2nd Year Students
* 2022-2023

**Course Book of**

**Building Construction**

For the 2nd year students

Bachelor Degree in Architecture

First and Second Semesters - Academic Year: 2022-2023

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**Introduction:**

The content of the subject of building construction in the architecture study is designed to be of different syllabus from a similar title in civil engineering. In architecture, the subject mostly answers questions of (WHY) instead of answering questions of (HOW) as in civil engineering. For answering questions of (WHY), students have to be acquainted and aware to the design fundamentals of the subject.

**Course objectives:**

* Much of our knowledge in architectural design is vaguely and qualitatively stated. Their authority rest more on intuitive conviction than on theoretical demonstration.
* In contradiction to that, in addition to the qualitative knowledge, building construction quantitative knowledge are associated to and based on measureable parameters.
* This subject stimulate the awareness of the students that most building systems have inherent attributes of proportion, based on its physical characteristics. These vibrant proportions are a deduction of accumulated researches and experiences and not due to intuitive conviction as the golden ratio as an example.
* Goals of building construction subject is to design building systems that have strength, stiffness, stability, synergy, durability, recourse efficiency and beauty.

**Instructional strategies attempt to:**

* Establishing a basic technical knowledge and understanding of the building structural and architectural systems: their types, characteristics, advantages and disadvantages, standards and simplified preliminary design principles.
* Because building systems are the physical entities that comprise the incorporeal entity of design. This subject train students on the implementation and interacting of these building systems with the architectural design that should be growing through design stages.
* Extend their skill to analyze problems to find appropriate solutions for general practical detail design and measure its outcome against a standard.
* Developing the student’s ability to cope with much standard proportion of structural and architectural systems.

**What should students learn at the end of the course?**

* Choose the appropriate structural and architectural systems that match with the design assignments.
* Assess the preliminary dimensioning and introduce the final geometry of all systems.
* Produce basic building details.

**Forms of Teaching**

Different forms of teaching will be used to reach the objectives of the course:

* Language: English, official, improve ability to read, hear and write. Repeating in Kurdish by students.
* Power point presentations for all materials. Explanation, drawings.
* Demonstrating the systems characteristics using available simple material in class.
* Practicing every week theoretical data theory earlier in one week, sketch, individual, different cases, in practical classes by analyzing problems and finding solutions depending on standards and rules and transferring it to drawings by manual drafting. Class activity will be designed to let the chance for practicing on several aspects of the course in the classroom.
* students will be asked to prepare a study individually on selective local technical problems by performing measurements and analyzing them to form results and conclusions with the help and supervision of the instructor.
* Reports have to be submitted by students concerning the general basic topics of the course contents.
* A model of a unique building system have to be submitted by each student to cover all building systems of the subject.
* Quizzes will be hold during the academic year without prior notice to keep you continually reviewing the subject.
* Many questionnaires are held to stimulate students reviewing their understanding certain topics of relation to the subject but out of its contents.

To get the best of the course, it is suggested that you attend all the classes, review the required lectures and teacher’s notes regularly, submitting the weekly class work drawings and home work reports on time, all of them are foundations for the course. Try as much as possible to participate in classroom discussions, preparing the assignments given in the course.

**Grading**

The students are required to do two closed book theoretical exams of 10 marks each and two practical exams of 5 marks each at the mid of the 1st and 2nd semesters. The weekly class work drawing submissions for the academic year count 20 marks. The home work submissions, attendance, classroom activities, research paper and quizzes count 10 marks. There will be two final exams, theoretical and practical, will count 25 and 15 marks respectively. The final grade will be based upon the following criteria:

1st semester theoretical and practical exam: 25% (15+10) 2nd semester theoretical and practical exam: 15% (10+5) Class work drawing submission, Class activity, home works, participation

 : 20%

Final theoretical and practical exam: 40% (25+15)

Constructive classroom participation, submitting assignments, and attending class

will be evaluated by the lecturer over the year and used in borderline cases to determine the final grade. Exams and assignments require analytical work and not just memorization of topics or articles.

**Course material**

Required books:

* Mitchells, Building Envelope ,Peter Burberry.
* Mitchells, Building Structure ,Peter Burberry.
* Time saver Standard, Design Data.
* Neufert Architects Data.
* Architectural Graphic Standard.
* AJ Handbook of Building Structure.

Websites and magazines

 <http://www.reddit.com/domain/archrecord.construction.com>

<http://en.structurae.de/structures/index.cfm>

<http://www.pubs.asce.org/journals/architectural>

And any other Environment textbook published in 21st century.

The core materials of the course consists of the above books, articles from media and internet, and lecture’s notes, make sure you read and practice all the materials and prepare well before going for the exams.

Students are encouraged to search for any other materials that may help improve their detail design ability in reviewing relevant resources.

**Course programme**

*Week 1:* **Introduction**, course outline, how to practice building construction, building symbols.

*Week 2:* **Bearing wall systems**: function, pattern of wall systems, adv. & disadv., materials, proportions.

*Week 3:* **Masonry systems**:Bearing and partition wall systems: function, , bond types and conditions, materials, proportions.

*Week 4****:* Brick work**: Types, sizes, bonds.

*Week 5****:* Block work**: Types, sizes, bonds.

*Week 6:* **Stone work**: Types, sizes, bonds.

*Week 7*: **Post and beam systems**: definition, adv. & disadv, grid pattern and conditions, column and beam pattern in a grid, proportion of beam depth to span, simply supported and rigid frames.

*Week 8:* **Portal frames**: definition, adv. & disadv, pattern of arrangements and conditions, dimensioning, proportion of frame to span.

*Week 9:* **Arches**; definition, terminology, function, materials, types, adv. & disadv, geometry, conditions, dimensioning, proportion of rise to span.

*Week 10*: **Trusses**: definition, terminology, function, materials, types, adv. & disadv, geometry, conditions, positioning, dimensioning, proportion of rise to span.

*Week 11*: **Floor slab systems**: definition, terminology, function, types, adv. & disadv, geometry, conditions, dimensioning, proportion of depth to span. one and two way, flat plate, flat slab, drop slab .

*Week 12:* Midterm exam.

*Week 13*: **Concrete floor slab systems** one and two way ribbed slab. definition, terminology, function, types, adv. & disadv, geometry, conditions, dimensioning, proportion of depth to span.

*Week 14:* **Precast concrete floor slab systems**, definition, terminology, function, types, adv. & disadv, geometry, conditions, dimensioning, proportion to span.

*Week 15:* **composite floor slab systems**, definition, terminology, function, types, adv. & disadv, geometry, conditions, dimensioning, proportion to span.

*Week 16:* **Space structures**, definition, terminology, function, types, adv. & disadv, geometry, conditions, dimensioning, proportion to span,shell, membrane and tension structures.

*Week 17,18*:**Stairs**; definition, terminology, function, types, materials,adv. & disadv, geometry, conditions, dimensioning, proportion.

*Week 1*9***:* Roofing**, definition, terminology, function, types, materials, adv. & disadv, geometry, conditions.

Week 2*0,21*: **Doors**, definition, terminology, function, types, materials, adv. & disadv, geometry, conditions.

*Week 22:* 2nd Semester exam.

*Week 23:* **Windows**, definition, terminology, function, types, materials, adv. & disadv, geometry, conditions.

*Week 24,25****:* Internal finishing of floors, walls and ceilings*:* External finishing of walls and floors**: definition, terminology, function, types, materials, adv. & disadv, geometry, conditions.

*Week 26:*Report submission and discussion

**Final exam** will be determined by the exam board

This **syllabus** may be subject to changes, i.e., we may take either longer or shorter time to finish a topic, if any changes happened you will be notified well in advance.