



University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Architectural Engineering and Environmental Design

Form no. (12): Course Specification

1- Course Data

Course Code: AR 353	Course Title: Building Technology 3	Academic Year/Level: 3rd year / 5th semester
Specialization: Architecture	No. of Instructional Units Credit 3 Lecture 2 Tutorial 4	Prerequisite AR252

2- Course Aim

This course deals with the main **complementary elements** of a building (openings and stairs). Students begin by studying different materials of construction, finishing materials and accessories. Students also learn the different design considerations and architectural treatments of building joints.

The course aims to:

- Provide students with knowledge regarding the complementary elements of any building using different materials for construction and finishing.

3- Intended Learning Outcomes

a- Knowledge and Understanding	Through knowledge and understanding, students will be able to: <ul style="list-style-type: none"> • Classify the different components and materials of the main and complementary components of a building (openings, stairs and joints.) • Express and articulate building technology problems. • List concepts, methods and techniques of building construction process and installation.
b- Intellectual Skills	Through intellectual skills, students will be able to: <ul style="list-style-type: none"> • Analyze building elements and solve their structural problems. • Apply innovative structure systems & materials. • Apply the knowledge of working drawings, symbols, indications and details as well as properties of building materials on their building technology projects. • Differentiate between various construction and finishing materials.
c- Professional Skills	Through professional and practical skills, students will be able to: <ul style="list-style-type: none"> • Interpret technical drawings using manual drawing techniques. • Select materials that are suitable for specific purposes. • Identify installation problems on site.
d- General Skills	Through general and transferable skills, students will be able to: <ul style="list-style-type: none"> • Discuss and present ideas in a professional manner. • Use modern materials and information technologies required for sound professional practice. • Independently seek knowledge, set aims, targets, objectives and plan to meet them with a deadline (time management). • Adopt an open-minded approach in the appraisal of design issues, requirements and opportunities. • Listen and critically respond to the views of others. • Transfer techniques and solutions from one field of architecture to another.

--	--

4- Course Content

Week No.1	Introduction & previous course general review: Openings (Doors; by material or operation, windows; by material or operation, curtain walls, skylights, sun spaces,) vertical circulation (stairs, steps and ramps, escalators, elevators, ladders, special stairs,) expansion joints.
Week No.2	Flush Doors: Introduction to wooden doors: types by operation and mechanism. Different terms used for flush doors (door frame, rails, stiles, casing, face panels.) Design alternatives (solid, with glass inserts, louvered inserts.) Types of cross banding for flush doors, steps of manufacturing and installation. Illustrating different connections and details.
Week No.3	Panel Doors: Different terms used for paneled doors (door frame, rough frame, rails, stiles, casing, panels, moulds.) Types of panels. Design alternatives (solid with glass inserts, louvered inserts.) Introducing different wooden joints between (stiles to top, medium and bottom rails, panel to frame rails.) Steps of manufacturing and installation. Illustrating different connections & details.
Week No.4	Metal Doors: Differentiating type of doors according to materials such as Metal & U.P.V.C doors, glass doors, special doors. Types of aluminum doors by operation (hinged, sliding.) Doors hardware, steps of manufacturing and installation, Illustrating different connections and details.
Week No.5	Windows: Introduction to wooden windows: types by operation and mechanism. Different terms used in wooden windows (window frame, rails, stiles, casing and louvers.) Jamb and window sill types and details. Steps of manufacturing and installation, illustrating different connections and details.
Week No.6	Metal windows. Differentiating type of windows according to materials metal and U.P.V.C windows, curtain walls, sky light and sun space. Types of aluminum windows by operation. Types of glazing (single, double, triple.) Steps of manufacturing and installation, illustrating different connections and details.
Week No.7	Continuation of the previous lecture and evaluation.
Week No.8	Introduction to stairs: Introduction classification, design criteria and related construction systems, introducing different shapes of stairs, (direct flights, quarter turn flight, 180 return stairs, two flight, three flight, four quarter turn flight, divided stairs, elliptical stairs and spiral stairs. Stair elements terms (riser, tread, nose, head room, hand rail, balustrades).
Week No.9	Stairs materials. Illustrating different stairs materials (concrete stairs, steel stairs, wood stairs, stone stairs, and glass stairs) L-shaped concrete stairs, construction system of RC stairs, Illustrating different details.
Week No.10	Reinforced concrete stairs. U-shaped concrete stairs (different stair elements, flights, staircase, platform landing, floor landing.) Different tread finishing materials (marble, granite, stone, precast terrazzo, vinyl, ceramics.) Illustrating different details for handrails and balustrades.

Week No.11	Wood stairs: Illustrating different connections and details, construction system of wood stairs, illustrating of different details for balustrades, handrails and accessories.
Week No.12	Continuation of the previous lecture and evaluation.
Week No.13	Steel stairs. Illustrating different connections and details. Construction system of steel stairs - illustrating of different details for balustrades, hand rails, newel posts and accessories.
Week No.14	Spiral stairs Illustration of construction helical or spiral stairs, illustrating of different details of balustrades, handrails and accessories.
Week No.15	Joints: expansion joints. Flush seismic expansion joint cover, all way expansion joint cover, metal seismic expansion joint cover, vertical exterior expansion and seismic joint seals, roof expansion joint cove.

5- Teaching and Learning Methods

The course comprises a combination of:
Lectures, site-visits, project work, research assignments and discussion sessions.

6-Teaching and Learning Methods for Students with Special Needs

- Consulting with lecturer during office hours.
- Consulting with teaching assistant during office hours.
- Private sessions for redelivering the lecture contents.
- For handicapped accessibility, please refer to program specification.

7- Student Assessment

Students must present: a "History & Theory Notebook" which will be the basis for assessment and serves as a future reference for the students and research. Students also have three exams throughout the semester.

Asses No.	Procedures used		Start Week No.	Subm. Week No.	Weighting of Asses.
	Type	To assess			
1	(1CI):Review on the previous course	Knowledge and practical skills.	1	1	%
	(1H): Wall Section [full details]	Knowledge and practical skills.	1	2	%
2	(2CI): Wood door [flush]	Knowledge and practical skills.	2	2	%
	(2H): Wood door [flush]& details	Knowledge and practical skills.	2	3	%
3	(3CI): Wood door [panel]	Knowledge and practical skills.	3	3	%
	(3H): Wood door [panel]&details	Knowledge and practical skills.	3	4	%
4	(4CI): Metal door	Knowledge and practical skills.	4	4	%
	(4 H): P.V.C. door	Knowledge and practical skills.	4	5	%
5	(5 CI): Wood window	Knowledge and practical skills.	5	5	%
	(5 H): Wood window & details	Knowledge and practical skills.	5	6	%
6	(6 CI): Metal window	Knowledge and practical skills.	6	6	%
	(6 H): P.V.C. window	Knowledge and practical skills.	6	7	15%
7		Knowledge and intellectual skills Practical skills	7	7	10%
8	(8 CI): Stairs	Knowledge and practical skills.	8	8	%
	(8 H): Stairs	Knowledge and practical skills.	8	9	%

9	(9 CI): Concrete stairs	Knowledge and practical skills.	9	9	%
	(9 H): Concrete stairs & details	Knowledge and practical skills.	9	10	10%
10	(10 CI): Concrete stairs & details	Knowledge and practical skills.	10	10	%
	(10 H): Concrete stairs & details	Knowledge and practical skills.	10	11	%
11	(11CI): Wood stairs	Knowledge and practical skills.	11	11	%
	(11 H): Wood stairs & details	Knowledge and practical skills.	11	12	10%
12		Knowledge and intellectual skills Practical skills	12	12	%
13	(13CI): Steel stairs	Knowledge and practical skills.	13	13	%
	(13 H): Steel stairs(spiral) & details	Knowledge and practical skills.	13	14	%
14	(14CI): Joints in building	Knowledge and practical skills.	14	14	%
	(14 H): Joints in building	Knowledge and practical skills.	14	15	5%
15	Opening (Doors & windows)	All skills.	3	7	5%
16	Stairs	All skills.	9	13	5%
17	.	Knowledge and intellectual skills Practical skills	16	16	40%
Total					100%

8- List of References:

a- Course Notes	Notes are handed out to the students throughout the semester.
b- Required Books (Textbooks)	<ul style="list-style-type: none"> • CHING, T., <i>Building Construction Illustrated, 4th edition</i>. London: John Wiley & Sons, 2008.
c- Recommended Books	<ul style="list-style-type: none"> • JIRICNA, E., <i>Staircases</i>. London: Laurence King Publishing, 2001. • ALLEN, E., <i>Architectural Detailing; Function-Constructability & Aesthetics</i>, Second Edition. London, John Wiley & Sons, 2006. • SIDNEY, L., <i>Construction Building Envelope and Interior Finishes Databook</i>. New York: McGraw-Hill, 2001. • BARRY, R., <i>The Construction of Buildings: Multi-storey Buildings, Foundations and Substructures, Structural Steel Frames, Floors and Roofs, Concrete, Concrete Walls and Cladding of Framed Buildings</i>. London: Wiley-Blackwell, 2001. • GUTHRIE, P., <i>The Architect's Portable Handbook</i>. New York: McGraw-Hill, 2003. • BANGASH, T., <i>Lifts, Elevators and Escalators</i>. London: Belkema Publishers, 2007. • BLANC, A, <i>Stairs</i>, 2nd edition. London: Architectural Press, 2001. • GARRISON, E., <i>The Graphic Standards Guide to Architectural Finishes</i>. London: John Wiley & Sons, 2002.
d- Periodicals, Web Sites, etc.	N/A