



NAWROZ UNIVERSITY

ARCHITECTURE ENGINEERING DEPARTMENT

March-2014



Syllabus

of Architecture Engineering Department

Nawroz University



First Year				Second Year				Third Year			
Subject	Hours		Units	Subject	Hours		Units	Subject	Hours		Units
	Th.	Pr.			Th.	Pr.			Th.	Pr.	
Architecture Design & Graphics	2	8	12	Architecture Design II	2	8	12	Architecture Design III	2	8	12
Building Construction I	1	2	4	Perspective & Shadow	1	2	4	Theory of Structures	1	1	3
Principles of Design	2	--	4	Building construction II	1	2	4	Working Drawings	1	3	5
Descriptive Geometry	1	1	3	Principles of Architecture	2	--	4	History of Architecture II	2	--	4
Free Hand Drawing I	1	3	5	History of Architecture I	2	--	4	Concrete & Steel Design	2	--	4
Mathematics & Statics	2	--	4	Free Hand Drawing II	1	3	5	Planning & Housing	2	--	4
Kurdology	1	1	3	Computer CAD I	1	1	3	CAD II	1	1	3
Computer	2	--	4	Mechanic & Strength of Materials	2	--	4				
Engineering Debate	--	2	0	Surveying	1	1	3				
English	2	--	4								
Total Hours	14	17	43	Total Hours	13	17	43	Total Hours	11	13	35
	31				30				24		

Fourth Year				Fifth Year					
Subject	Hours		Units	Subject	Hours		Hours		Units
	Th.	Pr.			Th.	Pr.			
Architecture Design IV	2	8	12	Urban Design Infill	2	6	--	--	5
Urban Design	2	--	4	Design Thesis	2	6	3	14	15
Interior & Landscape Design	1	3	5	Estimation & Professional Practice	2	--	--	--	2
Theory of Architecture	2	--	4	Specification & Estimation	--	--	2	--	2
Engineering Services	2	--	4	Local Architecture	2	--	2	--	4
Architectural Environment & Acoustics	2	--	4	Architecture Criticism	--	--	2	--	2
Advanced Building Technology	2	--	4	Philosophy of Architecture	2	--	2	--	4
Total Hours	13	11	37	Total Hours	10	12	11	14	34
	24				47				

Th. = Theoretical

Pr. = Practical

Total No. of Hours: 156.

Total No. of Units: 192.

First Year

First Year					
No.	Code No.	Subject	Hours		Unit
			Th.	Pr.	
1	A.E. 101	Architectural Design & Graphics	2	8	12
2	A.E. 102	Buildings Construction I	1	2	4
3	A.E. 103	Principles of Design	2	0	4
4	G.E. 104	Descriptive Geometry	1	2	4
5	A.E. 105	Free Hand Drawing I	1	3	5
6	G.E. 106	Mathematics and Statics	2	0	4
7	G.E. 107	Computer	1	1	3
8	G.E. 108	Kurdology	2	0	4
9	G.E. 109	Engineering Debate	0	2	0
10	G.E. 110	English	2	0	4
			14	18	44
		Total Hours	32		

A.E. = Architecture Engineering

G.E. = General Engineering

Marks Distribution

Subject	First Semester	Mid-Year		Second Semester	Final		Total mark
		Th.	Pr.		Th.	Pr.	
Architectural Design & Graphics	35	0	10	35	0	20	100
Buildings Construction I	20	10	10	20	20	20	100
Principles of Design	5	30	0	5	60	0	100
Descriptive Geometry	20	10	10	20	20	20	100
Free Hand Drawing I	35	0	10	35	0	20	100
Mathematics and Statics	5	30	0	5	60	0	100
Computer	20	10	10	20	40	0	100
Kurdology	5	30	0	5	60	0	100
Engineering Debate	35	10	0	35	20	0	100
English	5	30	0	5	60	0	100

Subject	Architectural Design and Graphics	No. of Hours	10	No. of Units	12
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Course Objectives:

- Developing the creativity thinking at what related to drawing and design.
- Identifying the basic fundamentals of the two and three dimensional design: the concept, elements, fundamentals, principles of composition, and kinds of compositions, using the production technology to facilitate the idea.
- The aim for the first year is to make students have the ability to design, present and magnate architecture concepts.

Introducing Architecture and Engineering Tools, drawing free hand lines vertical & horizontal, drawing lines by tools vertical & horizontal, drawing lines by tools vertical & horizontal & diagonal, Filling geometrical shapes with continuous & different dashed lines, Composition of 4 shapes Drawing A3 with repetition of one, Composition of Intersection between textures, Composition of straight and curved lines, Spatial arrangement using copies of one shape, Collage composition breaking the dominance of a Shape, Scientific picnic observing the nature, Abstracting an image of animal or plants from nature, Introduction to the first 3d Modeling from two color composition, 3D model for White and black or two color composition (start from Cube), Plan Drawing, First Elevation Drawing, Second Elevation Drawing, Final Drawing top view & elevations for the 3D model, Introduction to the 3D model isometric, Final the 3D model isometric, Introduction to the second semester, Weekend house project., Site visiting to design a Weekend house project, The studies of site and the functional program of the project, Preliminary (mass model) First concept, (DAY SKETCH) designing a symbolic gate or (LOGO DESIGN), Preliminary presentation, Plan Learning and drawing, Drawing elevations, Final elevations, learning section drawing, Drawing First section, Drawing Second section Pre-final presentation all requirements, Drawing 3D isometric, Final modeling

References:

- Architecture: Form, Space, and Order by Francis D. K. Ching.
- Architectural Graphics by Francis D. K. Ching.
- Drawing and designing step by step
- Architectural Standard - Ernst & Peter Neufert.



Subject	Principles of Art and Design	No. of Hours	2	No. of Units	4
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Course Objectives:

- Develop the abilities of analysis and criticism through establishing the necessary principles, reinforcing and studying the concepts of space, mass, and shape from different sides, acquainting with the most important critical discussions.
- Increase the knowledge of student about the design & how to design (composition, picture, sculpture, etc...).
- Understanding form, function, Design concepts and Design processes.

Introduction: What is art and architecture?, Design elements, Design principles, Color in design and architecture., Architectural Design principles with examples, Architectural Debate (students reports), Proportion of design (1). Golden Ratio, Proportion of design (2) Le Modulor, Architectural design thinking, Unity of design, Architectural composition compliments, Constructional design, Architectural form and space, Architectural Design Debate, Architectural Design Debate (students reports of architects and buildings)

References:

- Architecture Principia: Architectural Principles of Material Form by Gail Peter Borden and Brian Delford Andrews (Jan 21, 2013).
- The Elements of Architecture: Principles of Environmental Performance Buildings by Scott Drake (Apr 30, 2009).
- 10 Principles of Architecture by Ruth Slavid.

Subject	Building construction	No. of Hours	2	No. of Units	4
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Course Objectives:

- Identifying the First year students in the department of Architectural Engineering with the different building materials on the local building materials and the related building works (Bonding and setting up these materials together).
- The academic term includes site visits and tests.

General Introduction to the Building Construction (stages of building , types of building / skeleton ,bearing walls , component), Earth works (excavation, filling, stability of excavation, drainage of water, soil compaction), Foundations works (types of soil , soil classification , types of foundation , settlement of foundation , types of settlement), Piles works (uses ,kinds of piles according to materials manufactured and loads transmitted , load tests), Concrete works (composition of concrete, aggregates properties and grading, types of cement, local martials), Characteristics of concrete (compressive, tension, shear and bending strength, laboratory tests, admixtures, types of admixture), Brick works (types of brick according to materials and their shapes, stages of manufacturing, engineering properties), Uses of brick in building construction (types of bonding: heading, stretching, bull, English, Flemishetc.) , Masonry works (stones) / origin of stones , uses of stones in building construction , engineering characteristics , Types of rocks (geological classification, igneous , sedimentary and metamorphic rocks , engineering properties), Forms scaffoldings, Means of moving between levels (types: stairs, ramps, moving stairs, lifts, materials: metallic and concrete ...etc., Doors: (definition, functions, types and materials), Windows: (definition, functions, types , and materials), Doors: (types basics: side suspend, sliding vertical and horizontal, rotary , accordion, materials ; wooden, metallic and poly plastic materials ,properties of materials), Windows: (types basics: wooden, metallic and poly plastic materials , properties of materials., Practice: work shop, Columns @ Beams, Isolation materials, Floors @ roofs (materials, properties, types of loads, cast in situ, precast, prestressed ...etc.), Finishing (definition, functions, finishing of outside and inside. Materials and their properties).

References:

- انشاء المباني للمؤلفين آرتين ليفون و زهير ساكو
- انشاء المباني للمؤلف عاطف السهيري
- Building construction –Rangwala.

Subject	Free Hand Drawing	No. of Hours	4	No. of Units	5
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Course Objectives:

- Developing the students' skills in various medium, focusing on proportion and values of lighting degrees, still life and human figure.
- Develop the in-site sketching skills, Field trips and studio setting.

Creating Simple shapes and Objects, Draw Basic Shapes (1 cube Perspective) with pencil, Draw Basic Shapes (2 cube Perspective), Draw Basic Shapes (1 cylinder Perspective) with shade and shadow, Exam Drawing Basic Shapes (still life cylinders and cubes), Draw geometrical forms (spherical forms) , Draw geometrical forms (ununiformed forms), Exam Drawing geometrical forms (still life forms), Draw geometrical forms (ununiformed forms with different materials) 3D building drawing and elevation studies using shade and shadow with Perspective., Outside building drawing(1) , Learning how to use wood color , Still-life with wood color, Outside building drawing with wood color(2) , Learning how to use ink pens , Still-life with ink pens, Outside building drawing with ink pens(3) , Exam Drawing Outside building with different techniques ., Landscape Drawing using pencils, Landscape Drawing using wood color.

References:

- "Sketch Examination" by Sumiao Jingwe.
- Freehand Drawing and Discovery: Urban Sketching and Concept Drawing for Designers, James Richards.
- Freehand Sketching by Paul Laseau.

Subject	Architectural Debate	No. of Hours	2	No. of Units	0
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Course Objectives:

- Debating in classrooms and for student projects helps students develop educational skills and critical-thinking skills
- Learn tolerance for opposing viewpoints and build their sense of personal expression and self-esteem.

Debating in classrooms and for student projects helps students develop educational skills and critical-thinking skills, learn tolerance for opposing viewpoints and build their sense of personal expression and self-esteem.

The student (debater) learns to use a library, and to find the exact information he needs in the shortest possible time. The student learns to be smart and accurate in his exposition of an issue. He learns to analyze and to distinguish between what is important and crucial

What is not? He learns the need of proving his statements; of supporting every statement with valid evidence and sound reasoning (being logical).

References:

- Debating: A Brief Introduction for Beginners", Debating SS Incorporated, 2008.
- "Debating", Simon Quinn, Jan. 2005.
- Different In-field web sites- "www.learndebating.com".

Subject	Mathematics & Statistics	No. of Hours	2	No. of Units	4
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Course Objectives:

- Present basic mathematic concepts and show how to deal with problems.
- Provide the students with a review and reference for mathematical techniques you will need in your mathematical course.
- Allow the students to perform the mathematical manipulations necessary for a particular problem without getting bogged down in lengthy derivations.

Functions, Types of functions, Operation of functions, Functions of A. value, Graph of functions, Graph of Trigonometric function, Graph of Exponential function, Non algebraic function, Def., Trigonometric functions, Power function, Special case, Properties, Limit of function, Definition, Limit of function, Solving equation, Continuity and Differentiability, Derivations, Definitions, Rules, Derivative of different functions (polynomial, Trigonometric,), Derivative of Exponential, Hyperbolic & inverses functions, Partial Derivatives, Integration, Definition, Rules, Integration of Trigonometric, Integration of Exponential functions, Technique of Integration, Basic integration formulas, Integration by parts, rational functions by partial functions, Double and Triple integrations, Matrix, definition, determinant, solve the equations, Vector, Introduction, vectors in space.

References:

- George B. Thomas, Jr. "International Edition 11th, 2005.
- Frank E. Junior and Phillip Schmidt, "Calculus", 1990.
- Schaum's out lines, "Advanced calculus", second edition.

Subject	Descriptive Geometry	No. of Hours	3	No. of Units	4
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Course Objectives:

- Training of three dimensional imaginations.
- Deal with drawings using tools or by free hand.
- Dealing with different ways of projection, for architects should always be able to choose the most adequate and reasonable way of projection suiting the respective purpose.

Introduction, First Trail to use free hand lines, Using Compose, Using Tools, Point system of projection, Central Projection, Orthogonal projection, Side top and front views, Horizontal and Vertical Planes, H.P and V.P. and Side/ Profile Plane, Projections/ and construction lines, Planes and Projection Review, Introduction II, 3D isometric for cube, 3D isometric for cylinder, 3D Isometric for complicated objects, 3D Isometric for complicated objects II, Training on taking different 3D drawings from 2d projection, Training on taking different 3D drawings from 2d projection, Training on taking different 3D drawings from 2d projection, Practice 3D Objects, Practice 3D Objects, H.P. + V.P. + S. P.

References:

- Book:Descriptive Geometry.
- Lectures by the Instructor

Subject	Computer	No. of Hours	2	No. of Units	4
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Course Objectives:

- Introduce the student with computer hardware and software.
- Identify and use different types of computer components.
- Introduce Information and Communication Technology term to the student.
- The student will be able to use a PC computer with Microsoft Windows 7 and Microsoft Word 2010 in professional way.

General Concepts & Computer Types, Computer Hardware, Computer Software, Numbering Systems, Computer Networks, ICT, Ergonomics and Ethics of Working with Computers.

References:

- الحاسوب والبرمجيات الجاهزة "المهارات الأساسية" – د. محمد بلال الزغبى, د. احمد الشرايعة, سهير عبدالله, خالدة محمد الزغبى

Subject	Kurdology	No. of Hours	2	No. of Units	4
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Course Objectives:

- Teach students to listen to lectures in English, delivered by a native speaker.
- Develop ability to discourse at an academic level in Behdini Kurdish.
- Give students an overview of Kurdish history.
- Teach students some comparative history, so they will understand the experience of other nations too.
- Explain to students that there are different viewpoints about Kurdish history, and to help them to evaluate these different opinions fairly.

To teach students to listen to lectures in English: delivered by a native speaker.

To give students an overview of Kurdish history.

To teach students some comparative history, so they will understand the experience of other nations too.

To explain to students that there are different viewpoints about Kurdish history, and to help them to evaluate these different opinions fairly.

Learning Outcomes:

Students will know some key dates and other objective data about their history.

Students will be able to perform simple role plays (Real Life Dialogues between a Student & a Visitor) in pairs about their history, in English.

They should be able to welcome visitors to Kurdistan and explain some key elements of Kurdish history to them in English.

They will gain some practice reading and writing Latin-script Behdini, since familiarity with the Latin.

References:

- Kurdology1 (Behdini/Arabic)" English translation available as PDF, Qasim Berwari.
- "Kurdistan: in the shadow of History" , Susan Meiselas.
- "The Kurds: a Concise Handbook", Mehrdad Izady.
- "Historical Dictionary of the Kurds", 2nd Edition, Michael Gunter.



Subject	English	No. of Hours	2	No. of Units	4
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Course Objectives:

- Identify and acquire the relevant terminology of the field.
 - Use words they learn in meaningful and grammatical written and spoken sentences.
 - Skim texts for main ideas and scan texts for details.
 - Ask and respond to written and spoken questions.
 - Speak and express their opinions clearly, initiate discussions and argue using appropriate communicative strategies.
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Parts of speech: (nouns, pronouns, verbs, adverbs, prepositions, conjunctions, interjections).

Kinds of sentences: (simple, compound, complex), subordinate clauses, change of sentences from simple to compound and vice versa, tenses, passive and active, direct and indirect speech.

English Communication Skills in Engineering: Telecommunication Engineering, Trends and Scope of Communication, Electronics, Using Cellphones and Computers to Transmit Information, How does a Cellphone work?, Telephones: Then and Now, Electronic Mail.

References:

- Different texts and passages from web sites.

Second Year

Second Year					
No.	Code No.	Subject	Hours		Unit
			Th.	Pr.	
1	A.E. 201	Architectural Design II	2	8	12
2	A.E. 202	Perspective and Shadow	1	2	4
3	A.E. 203	Buildings Construction II	1	2	4
4	A.E. 204	Principles of Architecture	2	0	4
5	A.E. 205	History of Architecture I	2	0	4
6	A.E. 206	Free Hand Drawing II	1	3	5
7	G.E. 207	Computer CAD I	1	1	3
8	A.E. 208	Mechanics and Strength of Materials	2	0	4
9	G.E. 209	Surveying	1	1	3
			13	17	43
		Total Hours	30		

A.E. = Architecture Engineering

G.E. = General Engineering



Subject	Architectural Design II	No. of Hours	10	No. of Units	12
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Course Objectives:

- Introduce the students to architectural draft, abstract composition.
- The focus will be to analyze pervious design studies to understand architectural concept of local culture, plus issues that are sensitive to the integration of environment, locale architecture, and application of architecture.

Introduction (Family house, Villa): Site Visit, Examples, Data Gathering, Site Analysis, Final Report, Day Sketch, Concept, Final Concept, Plans – Sections, Final Plan, Sections, First Prelim demand (Site Plans), First Prelim demand (Sections), Model, General criticism, Plans – Elevations, Final Plan, Day Sketch, Pre-final, General criticism, Final,

Introduction (Museum for Peshmarkah): Examples, Data Gathering, Site Analysis, Final Report, Day Sketch, Concept, Final Concept, Plans – Sections, Final Plan, Sections, First Prelim demand (Site Plans), First Prelim demand (Sections), Model, General criticism, Plans – Elevations, Final Plan, Day Sketch, Pre-final, General criticism, Final

References:

- Architects Data – Ernst Neufert.
- Housing – John Macsai.
- Timesaver for Building Type – Joseph De Chaira & John Callender Design with confidence step by step- Mike W.Lin Asla.

Subject	Free Hand Drawing II	No. of Hours	4	No. of Units	5
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Course Objectives:

- Develop the in-site sketching skills and creative expression to build environment.
- Develop the student's skills in using watercolors, poster, pastel, oil colors in advanced techniques.
- Develop the student's ability to control the complex shapes in advanced techniques.

Definition ores water colors, colors, brushes and special drawing watercolor paper. With direct application in front of the students and the definition of the specificity of the colors in each type and the emphasis on the differences between covered colors and transparent colors with examples and models. Extract bilateral, trilateral colors and application of exercise on it with emphasis on the intensity of the color. Review the tonal relationships guided wheel colors, contrasting colors and harmonious and talk about primary and secondary colors and neutrality. And guide students to avoid the use of black and white color found in cans of water colors. Implementation drawing by one color with teaching students how to achieve shade tones and hue, Through the still life model. Implementation of drawing inside the studio (still life) by using all colors. Implementation of drawing inside the studio by using plants, fruits with the clay form or ceramic. Drawing trees from nature with watercolor. Implementation of drawing from nature provided that there is a relationship between vegetation, walls and architectural details landscape. Drawing inside the studio (still life) with existence of a variety materials, with emphasis on the completion complete drawing with back round. Implementation drawing outside the studio for architectural elevations. Exercise in the studio for model in glass and shiny materials to learn how to draw a transparent materials and optical reflections. Implementation of drawing inside the studio for more complex model with cloth background. Study the Figures through model and the use of simple water colors. Drawing by colored pencils, quick layouts for figures with different movements, with a quick drawing for face human. Drawing inside the studio to the nature still life by using wooden colored pencils. Drawing buildings outside by using vanishing points and implementation by ink pens and wooden colored pencils. Layouts for quick rigid life still life using watercolors and ink pens. Identify the ores of mud and make models which make sure the relationship between mass and space. Make models by mud. Drawing by poster colors the form inside the studio. After the presentation by definition poster colors and separation between them and watercolors. Drawing by poster colors the form inside the studio. Perspective drawing of the elevations with coverage the all areas in the subject by color. Perspective drawing of the architectural details with coverage the all areas in the subject by color. Drawing Furniture with colors Draw a piece of furniture with ornamental plants. The end of the second course exam and provide an opportunity for the student to choose material implementation of the action.

References:

- Still Life (step by step art school), By Buchan Jack and Baker Jonathan.

- Landscaper (step by step art school), By Buchan Jack and Baker Jonathan.

Subject	Principles of Architecture	No. of Hours	2	No. of Units	4
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Course Objectives:

- Understand conceptual elements of which architectural artefacts is composed.
- Know the definitions of these conceptual elements.
- Identify architectural artefacts that illustrate these elements
- Understand the systematic thinking and logical inference techniques and principles used in solving architectural design problems.
- Understand the phases of architectural design phases in different methodological approaches used in field of architecture.
- Apply certain methods and techniques in solving simple architectural problems.

Architecture as the Identification of Place: Introduction, Place Identifying, Conceptual Elements/ Horizontal Elements, Place Identifying Conceptual Elements / Horizontal Elements, Place Identifying Conceptual Elements / Vertical Elements, Place Identifying Conceptual Elements / Vertical Elements, Openings in Place, Defining Elements, Modifying Conditions of Architecture, Modifying Conditions of Architecture, Place Ordering Principles,

Design Methodology in Architecture: Introduction, Black Box Methodology in Architectural design, Glass Box Methodology in Architectural Design, Architectural Design Process/ Analysis of Design Problems, Space Adjacency Analysis, Architectural Design Process/ Synthesis of Design Solutions, Architectural Concept Generation/ Different Approaches, Analogy as an Approach for Concept Generation, Analogy as an Approach for Concept Generation.

References:

- Unwin, Simon, 2003, "Analyzing Architecture", Taylor & Francis e-Library.
- Ching, Francis, 2007, "Architecture: Form, Space & Order", John and Wiley & Sons, Inc, New Jersey.
- "أساليب التحليل المنهجي للتصميم المعماري"، احمد محمد شهاب.



Subject	Building construction II	No. of Hours	3	No. of Units	4
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Course Objectives:

- Clarify the vocabulary of structural elements and terms of building for the student by discussing each element or building system and all the details of the construction project with the student to strengthen his information.
- Teach the student how to design and draw a detailed construction of the building in terms of information to link the structural method and the accuracy of the drawing.

Introduction to Types of systems in construction: Elements of structure, Foundation, Ground floor plan 1/50, Ground floor plan&1st floor plan 1/50 (with details), Site Visiting, Foundation plan 1/50, Sections 1/50, Prelim presentation, Elevations 1/50, Criticism, pre final presentation, Criticism, Final presentation.

Introduction to Details of structure : Foundation Details 1/10, Stairs Details 1/10, Windows Details 1/10, Doors Details 1/10, Roof plan with parapet detail 1/50+1/10, Electrical plan 1/50, Sewerage plan 1/50, Criticisms, Final presentation.

References:

- Building Construction Illustrated by Francis D. K. Ching.
- Building Construction Handbook by R. Chudley, Roger Greenoy.
- Neufert Architects Data.

Subject	Mechanic and Strength of Materials	No. of Hours	2	No. of Units	4
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Course Objectives:

- Understand the principle of analysis many structural members which used in constructions as trusses, beams, plates ect.
- Study the fundamental concepts of mechanics that related to engineering problems.
- Introduce and understand the behavior of various engineering structure such as beams, plates, trusses under different actions.

Force analysis, Normal force, Shear force, Force due to uniformly distributed loads, Normal and shear stresses, Balance of force, Temperature stress, Trusses, Strain energy due to normal stress, Strain energy due to shear stress, Elasticity modulus E, Rigidity modulus E, Hook's law, Shear force and bending moment/sign convention, Shear force and bending moment/Diagrams, Shear force and bending moment/standard cases, Shear force and bending moment/subjected to a various load, Stresses in beam/relation between B.S. and radius of column, Stresses in beam/relation between B.S. and radius of column, Theory of simple bending, Moment carrying capacity of a section, Shearing stress of beam /general cases, Shearing stress across standard sections , bolt up section, Torsion /compound stresses, Torsion /mohr's circle, Thick cylinder and spheres, Thick cylinder and spheres/compound C, Column and struts.

References:

- Strength of materials – Second Revised Edition – S. S. Bhavikatti.
- Mechanics of Materials – Second Edition – E. P. Popov.
- Mechanics and Strength of Materials – Victor Dias Da Silva.



Subject	History of Architecture I	No. of Hours	2	No. of Units	4
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Course Objectives:

- Knowing the evolution of the first civilizations such as the Mesopotamian architecture and the valley of the Nile architecture and their architectural patterns and settlement.
- The students will be able to have the essential knowledge about each civilization, its architecture characteristics, invention they have, materials been used and methods and techniques they developed.
- The students will be able in brief to distinguish between the different orders and architecture styles and use it in the suitable location.

Introduction, Pre-History, Early Civilization, Mesopotamia, Early Egypt, Egypt at the Middle, After Egypt, Greek and Pre-Greek, Greek at the peak, Essay, Writing and Presentations, Buddhism, Early Romans – East, Romans- West, Rome legacy, Early Christianity, Christianity, Islam introduction, Islam legacy, Middle Ages I, Middle Ages II, TBD.

References:

- **1000 years of Residential Design.**
- **History of Architecture.**



Subject	Perspective & Shadow (Graphics)	No. of Hours	3	No. of Units	4
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Course Objectives:

- The students will learn the basics for drawing isometric and perspective accurately.
- Practical training on Isometric and oblique drawing.
- Practicing on perspective with one vanishing point.
- Practicing on two vanishing point perspective.
- Trying to draw complicated forms in perspective view.
- Drawing 3D perspective for their architectural design project.

Introduction and Course Overview: Basic Terms and Definitions, Fundamentals of Perspective, Two Point Perspective, Exercise I (Basic), Two Point Perspective, Exercise II (Inclined lines), How to draw a Pyramid (Determining the height), More complicated objects, Perspective of Inclined Service, Circular Objects, Drawing Stairs, One point perspective

Shade and Shadow: Terms and Definitions, Fundamentals of Shadow, Shadow of Point and Line, Shadow of Plane, Shadow of Cube, Multi Face Object, Shadow on Inclined surface, Shadow on Stairs, Shadow of Plan and Elevation , Shadow in Perspective.

References:

- Architecture: Form, Space, and Order by Francis D. K. Ching.
- Architectural Graphics by Francis D. K. Ching.
- Architectural Standard - Ernst & Peter Neufert.

Subject	Computer (AutoCAD 2D)	No. of Hours	2	No. of Units	3
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Course Objectives:

- Enables the students to draw full details of plan.
- Useful for modifying and developing the 2D plans.
- Generally it helps the students to translate what's in their minds into virtual plan or space.

Getting started with Auto CAD: introduction, history , User interface : menus :- application , ribbon , tools... , Drawing basics : line , circle , arc...., Drawing aids : snap , ortho , grid , osnap , Drawing setup : dynamic input , zoom , unit..... , Edit commands 1 : move , copy , offset , extend , Edit commands 2: rotate , trim , align , mirror.... , Alteration commands 1: break , fillet , chamfer , explode, Alteration commands 2:polar array , stretch , lengthen.

Complex objects : polyline , spline , multipleline.... , Utility & inquiry : distance , area , volume..... , Advanced display command : transparent , multiple cov, Advanced display command : transparent , multiple cov., Managing layers : layers , freeze , on , off , color..... , Annotation objects :annotate tools , text , tablet.... , Edit commands 3: rectangle , polygon , ellipse , donuts. Crosshatching : hatch , hatch edite..... , Rejoin & boundary command , Blocks and attributes :make . insert , burge..... , Design center & tool palettes ,Grips : select , copy with setting..... , Dimension : vertical , radial , allgined..... , Views & viewports & inserting image, Print & plot reparations , Drawing complete simple plan , Drawing complete complex plan.

References:

- User manual of Auto CAD program.
- E_book: http://www.dailyautocad.com/2014/01/e_books.html
- E_magazine: <http://www.almoandes.org>

Subject	Surveying	No. of Hours	2	No. of Units	3
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Course Objectives:

- Find the students' ability to deal with the surveying works in the practical sites.
- Identifying the engineering concepts of within the field of surveying engineering that are related to the architectural engineering works through designing, implementing and checking out the work.

General Introduction to the Surveying science: (Definition, Importance of survey in engineering projects, department of survey, types of survey).

Measurement of the length: (methods of measurement by step, metergag, cloth tape, and steel tape, ranging rods , pegs, plump v ,units of measurements and , scale), Practical (linear measurement (Ex. 1).

Measurement of distances: (direct and indirect measurement of distance, putting ranging rods at straight line:* in case of fission the last point and non-fission , measurement of distance in case of horizontal land with little dip and in case of inclined land)., Practical.

Measurement of angles by tape perpendicular and others, Determination depth of wells, height of buildings, chain surveying ., Practical.

Level instruments: type of levels, calibration and test of level, application of level instrument).

Objects of preparing contour lines: Definition, uses of contour maps, characteristics of contours, methods of contouring, Practical – contours map and earth work computation.

Computation of area from field notes and from plotted plan, Volume from cross sectional area, from spot level, and from contour lines, Types of angels, theodolite instrument, total station and horizontal angles, Principle of the Global Position System (GPS), Aerial surveying and modern means of surveying

References:

- Elementary surveying / BRINER .R.C @ WALF .P.R.
- المساحة و الجيوديزيا / د . سامح جزماتي
- المساحة المستوية / د . فوزي الخالصي

Third Year

Third Year					
No.	Code No.	Subject	Hours		Unit
			Th.	Pr.	
1	A.E. 301	Architectural Design III	2	8	12
2	A.E. 302	Theory of Structures	2	0	4
3	A.E. 303	Working Drawings	1	3	5
4	A.E. 304	History of Architecture II	2	0	4
5	A.E. 305	Concrete and steel Design	2	0	4
6	A.E. 306	Planning and Housing	2	0	4
7	G.E. 307	Computer (Auto CAD 3D)	0	2	2
			11	13	35
		Total Hours	24		

A.E. = Architecture Engineering

G.E. = General Engineering

Subject	Architectural Design III	No. of Hours	10	No. of Units	12
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Course Objectives:

- The student will identify the compound and multifunctional projects concerning their used and different service spaces.
- Students will learn to analyses different functions and zones in the buildings and understand and adjust the architectural program.
- Students will further learn to incorporate multiple functions and services in a building,

Introduction (Centre for culture and Art), Site Visit, Data Gathering , Examples, Site Analysis, Final Report, Day Sketch, Concept – First Present, Final Present, Plans, Concept to Plan, Final Plan, Day Sketch, Final Plans Present, Day Sketch Elevation, Plan to Elevation, Pre-final, Elevation, Final, Introduction (Secondary School), Site Visit, Data Gathering , Examples, Site Analysis, Final Report, Day Sketch, Concept – First Present, Final Present, Plans, Concept to Plan, Final Plan, Day Sketch.

References:

- Neufert Architects' Data, Fourth Edition (Ernst Neufert, Peter Neufert, 2012).
- Site and Sound, The Architecture and Acoustics of New Opera Houses and Concert Halls (Victoria Newhouse, 2012)
- Understanding Structures (Fuller Moore, 1998).
- Magazines: Detail – Review of Architecture, Architects Journal – UK.

Subject	Working Drawing (Building III)	No. of Hours	4	No. of Units	5
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Course Objectives:

- Educate the students the techniques and traditional and modern methods of construction.
- The students will be able to work, read the working and architectural drawings and learn the technical details of their own.

Skeleton building system, Advantage & disadvantage, Elements of skeleton building sys ., Kinds of construction grid, Kinds of column / Kinds of girder, roofs & floors concrete slab, Elevators, Foundations in skeleton building, Pre-Fabrication: Introduction to pre- fabrication technology, advantages of pre-fabrication, Pre- fabrication techniques and various building components– panel system / box system, column and beam system, foundation , walls, Type of pre-cast floors& roofs 1st, Type of pre-cast floors& roofs 2nd, Pre-cast staircase, Final project, Frame System Type of Frame System, Portal Frame System, Trusses of various types, North Light Factories, Shell-Light Structure, Space Frame Grid, Suspended system roof, Detailing of structural steel with connections for beams, stanchions, stairways, plate girders, Detailing of structural steel with connections for beams, stanchions, stairways, plate girders.

References:

- "Building Construction", vol. 3, by Barry, 1997.
- Working drawing handbook.
- "Structure and fabric", by Mitchel.
- تركيب المباني الأبنية الهيكلية، أنيس جواد، 1987، الجامعة التكنولوجية
- "Precast Concrete Construction", by Svetlana Brzev, British Columbia Institute of Technology, Canada.



Subject	Theory of Structures	No. of Hours	2	No. of Units	4
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Course Objectives:

- Enable the students to analysis (calculate the forces and determations) of different type of structures (beams, tresses, frames) both determinate and indeterminate.
- Enable the students to have a clear vision about each type of structures and where to be used in the designed structures.

Stability and determinacy of structures, Stability and determinacy with respect to supports, Statically determinate beams, Shear and bending diagrams, Statically determinate simple trusses, Statically determinate compound trusses, Statically determinate complex trusses, Statically determinate raised frames, Statically determinate composite structures, Approximate analysis for statically indeterminate structure, Elastic deformation of structures, Method of virtual work (beam), Method of virtual work (trusses), Method of virtual work (frames), Analysis of statically indeterminate structure, Method of consistent deformation (beam)and (frame), Method of consistent deformation (trusses)

Slope –deflection method: (Slope –deflection method (beam), Slope –deflection method (frames))

References:

- "Elementary theory of structures", Yuan-Ya Hsieh.
- "Elements of the theory of structures", Jacques Heyman.

Subject	Planning and Housing	No. of Hours	2	No. of Units	4
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Course Objectives:

- Help the students to identify the developments that happened in the history of cities development and growth through the passage of time including the social, economical and technical effects.
- Understanding the Design and planning Criteria of Housing Projects.
- Studying the housing policies and strategies.

Introduction and history back ground about housing, Housing concept, terminology and definitions, Housing Form The idea of Neighborhood, Neighborhood structure, Residential Structure, Type of dwellings, Circulation and open space in the Neighborhood, Privacy Hierarchy and services in the housing, Sustainable housing development and Design, Site visiting, Excursion Housing policy and Strategies, Density and the advantages of high density Housing problem in Kurdistan and the governmental solutions, Role and regulations about housing in KRG, Learning from tradition to improve housing design.

Introduction to Planning (What is plan, Planning, who is planner and why planning is important, General introduction), Key concepts in planning (planning levels, participation, decentralization, space, urban-rural, Infrastructure, Land Management, regional planning), Major phases of Urban History (e.g. Agriculture, Pre Industry and industrialization), Ancient cities and urban civilization in Mesopotamia, Cities in medieval ages, Islamic cities, Global cities, cities Post war urban development, Tape of City, cities Urban development after WWI in Iraq, Principle of planning and Sustainable planning, Settlements Patterns, Relationships Between Human and Settlements, Land use planning zoning and tools, land use development, City challenges and hot issues (e.g. sustainability, poverty, traffic jam, services and infrastructure)

References:

- Mike Biddulph(2007): Introduction to residential Layout , Published by Elsevier Limited.
- Avi Friedman (2007): Sustainable Residential development: Planning and



Design for Green Neighborhood.

- Pacione, M. (2005): Urban geography: a global perspective. London etc., Routledge.

Subject	History of Architecture II	No. of Hours	2	No. of Units	4
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Course Objectives:

- Illustrate the adoption of the comparative analysis method and the distinction among the various architectural styles throughout history on the bases: The geographical location, the historical values, the climatic and geological description, and other of arts.

Introduction to the Renaissance era, Table of the comparative system for each style Comparative Analysis, Gothic Architecture, Byzantine Architecture, Italy homeland Renaissance, Geographical social Architectural character Pioneers Renaissance, Philipo Brunlleschi(1446 - 1377) , Study Architectural for church Santa Maria delfiore, Study Architectural for church Santa Lorinzo Leon Battista Alberti(1472 - 1404) , Study Architectural for church Santa Arsdicia, Study Architectural for Palazzo Rucellai, Donto Bramant(1514 - 1444) , Study Architectural for Montorio in Rome, Study the concept to Mannerism , Study Architectural to (Michel Angelo), Study Architectural for church santo lorinzo, Gollio Romanic(1546 - 1499) , Study Architectural for library in Sainlorinzo, Study Architectural for conservators, Palace and Senator's Palace Contributions Michel Angelo in cathedral Saint Pietro, Barocco and Rococo, Style new classic.

References:

- Peter Murray, renaissance Architecture, New York, 1985.
- Henry Millon, Barque and Rococo Architecture, New York, 1985.
- A. W. N. Pugin, The true principles of Pointed or christain architecture, New York, 1973.



Subject	Concrete and Steel Design	No. of Hours	2	No. of Units	4
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Course Objectives:

- Establish a successful arch. engineer who can use techniques skill to identify formulate and analyze problem and design concerning reinforced concrete and steel structural members.
- Teach the students the behavior and design of steel sections

Concrete and reinforced concrete chareters, Quality control and stress-strain curve, Ultimate strength design method, Flexural strength of R.C beam, Design of single R.C rectangular section, Under-reinforced beams, Over-reinforced beams, Design of one –way slabs, Design of doubly reinforced beams, Design of T –beams, Shear strength of beams, Continous beam and Continous one way slab, Columns design (axially louded), Columns design (bending moment and axial load, Long columns design, Foundation design, Steel products, philosophies of design, Tension members, Pin-connected members, Bolted and riveted connections, Welded connections, Beam design (flexural strength), Beam design(shear strength), Beam design(detection limitation), Compression members, Column design, Design of bearing plates.

References:

- B.M Ferguson, J.E Breen, and J.O Jirsa, "Reinforced Concrete Fundamentals".
- A.H Nilson and G.Winter, "Design Of Concrete Structures "
- Gaylord And Gaylord, "Steel Structures. "
- Aisc Manual.



Subject	Computer AutoCAD using 3D	No. of Hours	2	No. of Units	3
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Course Objectives:

- It make students have ability to draw anything (2D) by this program (plans, elevations, sections, free drawings and good rendering with animation video.
- Prepare the students to render and animate projects by Vray 3ds max.

The plan of course and references & history of 3ds max program, Explanation the main window for program, how to arrange it before start work, how to use object and change its parameters, how to use object and change its parameters, how to use shape and change its parameters, how benefit from the AutoCAD program and link it to 3ds max program, how to use materials and change its parameters, Camera basics(types and descriptivism), Lighting basics(external lighting with sun light), Lighting basics(interior lighting with natural light, Rendering, Rendering (environment, output ,light cache, common), RPC & Blocks.

References:

- “Vray 3ds max program 2013”, By James Wedding, P. E . and Dana Probert, E . I.T.
- “3ds max LT for DUMMIES”, BYMark Middlebrook, 2010.

Fourth Year

Fourth Year					
No.	Code No.	Subject	Hours		Unit
			Th.	Pr.	
1	A.E. 401	Architectural Design IV	2	8	12
2	A.E. 402	Urban Design	2	0	4
3	A.E. 403	Interior and Landscape Design	1	3	5
4	A.E. 404	Theory of Architecture	2	0	4
5	GE. 405	Engineering Services	2	0	4
6	A.E. 406	Architectural Environment and Acoustics	2	0	4
7	A.E. 407	Advanced Building Technology	2	0	4
			13	11	37
		Total Hours	24		

**A.E.** = Architecture Engineering**G.E.** = General Engineering

Subject	Architectural Design IV	No. of Hours	10	No. of Units	12
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Course Objectives:

The curriculum of the architectural design of the fourth year aims to enlarge the architectural student's recognitions and to depart from the thinking of a single building of a limited function to the general outline of the city and the student identifies how to relate the single project with the city urban fabric through the identification of the basics of dealing with the urban design and connecting it to the city urban fabric and the stretching of the visual and physical axes found in them and the impact of the urban fabric characteristics.

References:



Subject	Interior & Landscape Design	No. of Hours	4	No. of Units	5
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Course Objectives:**First course:** Interior Design

The aim is to identify the students with the most specialized aspects involved in interior design from those aspects in architectural design in general. This is done on two parts: theoretical and Practical both covers :

the intellectual, cultural and artistic trends are taught especially those overlapping with the industrial design, craftsmen production, materials and those trends that overlap with the artistic intellect of ornamenting, services and light systems, pieces of furniture

Second course: Landscape Design

The aim of this subject is the identification of the basic principles of designing the exterior spaces or what could be called the landscape and its integration with the building and the general city scene. The subject deals with the bases and principles that must be considered when selecting the location and projecting the building within it and treating the location problems.



References:

Subject	Urban Design Theories	No. of Hours	2	No. of Units	4
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Course Objectives:

This course is intended to cover the basic principles, definitions, concepts and elements of urban design and their role in the process of urban development. In addition to the process and approaches needed at macro and micro levels, the traditional and current trends in urban design profession, Visual studies, spatial analysis and Conceptual design, Major elements and determinants of urban form and spaces.

Urban design theory deals primarily with public the design and management of (i.e. the 'public environment', 'public space realm' or 'public domain'), and the way public places are experienced and used.

Public space includes the totality of spaces used freely on a day-to-day basis by the general public, such as streets, plazas, parks and public infrastructure. Some aspects of privately owned spaces, such as building facades or domestic gardens, also contribute to public space and are therefore also considered by Urban design theory.

References:



Subject	Advanced Building Technology	No. of Hours	2	No. of Units	4
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Course Objectives:

The subject aims to identify the students with technology as an intellect and application and the building technology in particular, and its relationship with architecture as a social requirement with the concentration on the ways to upgrade technology from primitiveness and craftsmanship to the modern scientific/industrial technology, within a complementary and comprehensive view in the architectural act.

References:

Subject	Environmentand Acoustics	No. of Hours	2	No. of Units	4
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Course Objectives:



First course: Environment

The aim of this subject is to identify the student with a wide database of the whole basic concepts of the reciprocal relationship between the natural environment and architecture.

Second Course: Acoustics

Identify the principles of sound behavior in the enclosed space and the nature of the acoustical phenomenon through the concepts of sound reflection, absorption, diffusion, and penetration in addition to their auditory response concepts.

References:



Subject	Theory of Architecture	No. of Hours	2	No. of Units	4
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Course Objectives:

Students have to understand the difference between the theory and the conceptual trend with their role in the process of designing.

Interested students should have a prior understanding of modern history and theory. Each student is responsible for attending lectures, completing assigned reading and actively participates in class discussions as well as individual research and group class presentations.

Evaluations will be based upon the Student's class participation, their contribution to the course, their exams and final writing assignment

References:

Subject	Eng. Services Sanitary & Air-Conditioning	No. of Hours	2	No. of Units	3
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Course Objectives:

The objectives of the subject are to introducing the basic principles of buildings services in a little detailing

Sanitary services

Introduced the basic principles of drainage services to students, (design water network, discharge surfaces water, fire networks).

Air-Conditioning :

introduced the basic principles of buildings air conditioning (mechanically and naturally), and most important standard systems internationally and locally, and how to calculate air condoning requirements for different spaces.

The electrical and lighting parts of the syllabus aim to Introduced the basic principles electrical systems to students including lighting system, electrical power distribution system, communication system and intercom system. Try to apply the above mention topics as design projects for the students.

References:

Fifth Year

Fifth Year							
No.	Code No.	Subject	Hours		Hours		Unit
			Th.	Pr.	Th.	Pr.	
1	A.E. 501	Urban Design Infill	1	3	0	0	5
2	A.E. 502	Design Thesis	2	10	2	12	15
3	A.E. 503	Professional Practice	2	0	0	0	2
4	A.E. 404	Specification & Estimation	0	0	2	0	2
5	A.E. 505	Local Architecture	2	0	2	0	4
6	A.E. 506	Architecture criticism	0	0	2	0	2
7	A.E. 507	Philosophy of Architecture	2	0	2	0	4
			9	13	10	12	34
		Total Hours	44				

A.E. = Architecture Engineering



Subject	Architectural Design V	No. of Hours	5 One semester	No. of Units	3
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Course Objectives:

This course is to produce a full architectural study about the tended project to cover every detail related to it in a suitable presentation.

The thesis project is the final result of the theoretical and practical architectural knowledge gained by the student through their academic study years. Each student will choose a project to work on continuously during the whole year expressing his intellectual and design approach .

Projects should be related to the local environment and culture either within the future plans of public sector, or environmentally friendly, or of symbolic nature, or housing, or preservation.

References:



Subject	Design Thesis Project	No. of Hours	14 One semester	No. of Units	8
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Course Objectives:

The final project is considered the final stage of the knowledge, which has been given to the student during his years of study, represented by intellectual maturity, the basics of the design work and its belonging to the place and its relation to the values and deep roots of his country, nation, society, tradition and culture and letting the student to express these values through his intellectual and design presentations of the selected project which we emphasize to be one of the real projects proposed by different state offices and which have clear dependable curriculum, or proposed by professors in order to solve a particular problem.

References:



Subject	Urban Design infill	No. of Hours	4	No. of Units	5
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Course Objectives:

This course is practical urban design aims to give the students the knowledge of urban redevelopment. The students will practice dealing with design problems related to urban renovation, historical conservation, rehabilitation and infill with emphasis on infill of a historical area.

The study will include a field trip to one of the historical sites in Duhok. Studying and analyzing the site, the historical, architectural, functional, social and environmental dimensions that affect design process.

References:

Subject	Estimation &	No. of Hours	2	No. of Units	4
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	Professional Practice				
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Course Objectives:

The subject of Estimation aims to identify the student with the executive issues concerning the work of the architect as a coordinator of the whole specializations involved in the implementation works in general and as a producer of the designing works in the presented primary ideas and their economical balancing and then preparing the detailed designs in particular.

While The Professional practice subject aims to identify the student with the basics of practicing the profession and the duties of the architectural engineer towards this profession through his design presentations, first, being as a creative thinker and, second, being as a coordinator and a leader of the working team in his field practice.

References:



Subject	Philosophy of Architectural	No. of Hours	2 One semester	No. of Units	2
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Course Objectives:

This subject aims to fulfill several educational objectives, which are important to the student of the primary studies, in the fifth academic year as identifying the student with the general principles of thinking which are dealt with by philosophy in its three main fields: the field of knowledge, existence and the value on the basis that architecture is one of the fields of knowledge which is studied through the fields of philosophy

References:



Subject	Architectural Criticism	No. of Hours	2 One semester	No. of Units	2
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Course Objectives:

Architecture Criticism is a Theoretical course aims to teach the students the different types of art criticism and the knowledge of Aesthetics and Art appreciation. Through the identification and historical review of Art Criticism theories, the students will get to know the evolution of Art appreciation and criticism theories.

The students will learn about modern theories in Criticism in Architecture related to Art movements of the 20 -21st centuries ending with the contemporary movements like Deconstruction and Folding Architecture.

References:



Subject	Local Architecture	No. of Hours	2	No. of Units	4
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Course Objectives:

Heritage It is a product of human experience, desires and needs from earlier civilizations which are inherited from the local ancestor.

Gaining the local knowledge about our own architecture heritages, that represents the social and cultural identity, the story of formulation our cities and societies.

The transferred knowledge throughout those product (best practice through best product), Economic factors (key attraction).

References: