Ministry of Higher Education and Scientific Research

University of Technology

Department of Architecture / Baghdad-Iraq

Academic Study Plan

2014-2015

Postgraduate curriculum

Master degree in

Architectural Design & Urban Design

And

Doctorate Philosophy degree in Architecture

Introduction

The Department of architectural Engineering founded in 1977 within the University of Technology in Baghdad. Through its teaching philosophy and curricula, the Department of Architecture strives to develop a basis for a truly national architectural school that emphasizes the importance of inspiration from Iraq's architectural heritage with a sophisticated and contemporary approach in both architectural and urban scale. During the period 1977-2012, around 1900 architects graduated, many of them are now well-established in various state establishments and some have also become well-known on the Arab-world and international levels.

Our department excels in providing basic and advanced Architectural engineering education. It has been designed to provide a firm foundation across a wide breadth of activities that fall under the umbrella of Architectural Engineering. We offer courses in areas related to Architecture, Urban design, landscape, interior architecture, Structure, Environment, and Construction Engineering. The theoretical program and practical skills that students learn in their degree program give them a unique advantage after they complete their program.

The Master of Science (MSc) degree in Architectural Engineering established in 1986, it's intended to meet the needs of students who wish to prepare for careers and expertise in areas such as design and analysis, Buildings Technology, Critical Theory, Building and Environment, Urban design, Project Management, and research. The program also provides excellent preparation for doctoral studies, which established in our department in 1992, a PhD philosophy degree in architecture and urban studies for minimum three years length and combines a practical and theoretical approach for learning and research.

The Master of Science in Architectural is a research-based Master's degree for students interested in pursuing in-depth architectural research study includes one courses year and one research project year. The curriculum gives the students some flexibility in choosing the electives from their areas of interest

The department offers MS programs of 36 units in the following areas:

- Urban design
- Architectural design

The Doctor Philosophy (PhD) degree in Architectural Engineering established in 1993 .

The System of the postgraduate Study:

The M.Sc. degree is obtained after passing two years study, First year is a preparation study which covers the required courses through attending theoretical lectures , preparing dissertation and essays and attending studios and workshops. Second year is for doing a research project.

The Ph.D. degree is obtained after passing three years study, First year is a preparation study, which covers the required courses through attending theoretical lectures, preparing dissertation and essays and attending workshops. After that two years for doing a research project (Thesis) .

Number of hours and units depended to obtain any kind of certificates are as follows:

- No. of units depended to obtain MSc degree is (38 units).

- No. of units depended to obtain PHD degree is (60 units).

MSc. Courses

Architecture Design Specification

Semester 1:

Code	Course	Weekly hours First semester		Credit unites
		Theoretical	Practical	
ARC-A 601	Design Strategies	2	-	3
ARC-A 602	Building System Techniques	2	-	2
ARC-A 603	Theory of Architecture	2	-	3
ARC-A 604	Systems and Architecture	2	-	2
ARC-A 605	Research Theory	2	-	2
ARC-A 606	English Language Techniques	1	-	1
Total		11	-	13

MSc. Courses

Architecture Design Specification

Semester 2:

Code	Course	Weekly hours		Credit unites
		Second semester		
		Theoretical	Practical	
ARC-A 607	Climatic Environmental design	2	-	2
ARC-A 608	Theory of Architecture	2	-	2
ARC-A 609	Research Applications	2	-	2
ARC-A 610	Islamic Architecture	2	-	2
ARC -A 611	Elective course (1)	2	-	2
ARC -A 612	Elective course (2)	2	-	2
ARC-A 613	English Language Techniques	1	-	1
Total		13	-	13

MSc. Courses

Urban Design Specification

Semester 1:

Code	Course	Weekly hours		Credit unites
		First semester		
		Theoretical	Practical	
ARC-U 601	Housing	2	-	3
ARC-U 602	Landscape Design	2	-	2
ARC-U 603	Climatic Urban Environment	2	-	2
ARC-U 604	Urban design Theory	2	-	3
ARC-U 605	Research Theory	2	-	2
ARC-U 606	English Language Techniques	1	-	1
Total		11	-	13

MSc. Courses

Urban Design Specification

Semester 2:

Code	Course	Weekly hours		Credit unites
		Second semester		
		Theoretical	Practical	
ARC-U 607	Sustainable Urban design	2	-	2
ARC-U 608	Urban design Strategies	2	-	2
ARC-U 609	Analysis of Urban Design	1	2	2
ARC-U 610	Research Applications	2	-	2
ARC-U 611	Elective course (1)	2	-	2
ARC-U 612	Elective course (2)	2	-	2
ARC-U 613	English Language Techniques	1	-	1
Total		12	2	13

Ph.D. Courses

Semester 1:

Code	Course	Weekly hours		Credit unites
		First semester		
		Theoretical	Practical	
ARC 701	Architecture Philosophy	2	-	2
ARC 702	Research Theory	2	-	2
ARC 703	Urban design Theory	2	-	2
ARC 704	Architecture and Environment	2	-	3
ARC 705	Elective course (1)	2	-	2
ARC-U 706	Elective course (2)	2	-	2
ARC-U 707	English Language Techniques	1	-	-
Total		12	-	12

Ph.D. Courses

Semester 2:

Code	Course	Weekly hours		Credit unites
		Second semester		
		Theoretical	Practical	
ARC 707	Theory in Architecture	2	-	2
ARC 708	Architectural Research Philosophy	2	-	2
ARC 709	Thoughts in Architectural Technology	2	-	2
ARC 710	Research Proposals Seminars	-	4	2
ARC 711	Elective course (1)	2	-	2
ARC 712	Elective course (2)	2	-	2
ARC 713	English Language Techniques	1	-	-
Total		11	4	12

Ministry of Higher Education and Scientific Research

University of Technology

Department of Architecture

Subjects Description of Master Curriculum

2014-2015

Architectural Design & Urban Design

MSc. Courses

Architectural Design Specification

Semester 1

ARC-A 601 : Design Strategies

This course aim to give a background on designer's strategies in there works and cover the following subjects: That is a Strategy (goals and attitudes) . Strategy in design process. Contemporary architectural movements. The impact of strategic thought on Contemporary architectural movements. The impact of strategic thought on in design process. Studying in reading theory. Reading process from designer, receiver and texts. Myth strategy. Textulity strategy .displacement strategy, implementation strategy. Workshops on these concepts in student works .

ARC-A 602 : Building System Techniques

The course aim generally to identify the relationship between building as an architecture and building as a construction. Specifically on many items: **Technology**: Technology definitions. Technology and human: Semper , Gasset, Heidegger, Mumfordand Valkov literatures. **The essence of Technology:** Technology and architecture. **Technology and Need**: Technology as a symbolic need. Technology as a social need. Technology as a utilitarian need **Technology as a Phenomenon**. **The impact of Technological change on building structure. Systems of Building:** Identify and describe the core activities in the systems development process . Evaluate alternative methods for building information systems Compare alternative methodologies for modeling systems, Identify and describe new approaches for system-building in the digital architecture **Structure as Architecture:** Structural Detailing, Interior & exterior structure, representation, symbolic .Construction, **and**

sustainable construction: Constructional efficiency, Construction constituents in architecture: Materials.

ARC-A 603 : Theory of Architecture

The course aim to clarify deferent viewpoint to architecture as a Theory from deferent theorist in architecture discipline by the following items. What is a theory? Is there theory in architecture? What are the criteria for evaluation a theory?.

Intellectual classification of theory in architecture: Normative and Positioning theory. Attitudes in architecture. Contemporary architecture. Theorist in architecture (Jenks ,Gossel,Peter Collins,Udo Kulterman). Arabic, Islamic and Western Architectural discourse. Modern architecture (functional and organic theory). Late modern architecture postmodern architecture. New Rationalism. New Realism (aldo Rosi,Venturi, Kunn ,Papper).

ARC-A 604 : Systems and Architecture

The aim of this course is to study and understand the importance of systems generally, and in architecture especially. It covers how to identify and study system definitions and how it is manifested in fields relevant to architecture on theoretical and practical levels. It shows the various theoretical terms such us order, context, organized constituents, structure in architecture thinking. Based on this, application of general system theory forms a base through which system is comprehension can prevail in urban context to understand the city as a system, information , language, signs , tradition…etc. as sub –systems forming our understanding of architecture as a systematic reality.

Each participant is given a topic to write a positional paper that reflects an understanding of systems and should debate his position in a mini seminars which the students form the major participant.

ARC 605-A : Research Theory

Scientific Research definition .**Research Process:** Models of Research. Analysis accomplish thesis according to basic research methodology. **Research characteristic** : research abstract and

Introduction characteristic and who to write . **Criteria of scientific research :** objectivity validity and reliability . **Previous literature:** types of literature, types of analysis techniques, & who to find gap in Knowledge, research concepts. **Research Questions** : how to find research Problem (types of problems) and sub Problems . **Research objective** : how to write research objective . Conceptual framework and theoretical framework, who to determine concepts, indicators and variables. **Operational definition** : Operational definition define and the different between definition and concepts . **Variables:** Types of Variables , measurements and their types. **Hypotheses:** Hypotheses definition, types of Hypotheses. **Research design:** Research design chapter , Developing a Research Plan ,Samples selection , Measurement Scales , Interview Method, Constructing Questionnaire . **Writing research paper**: What is scientific writing, How to write references, writing abstract , introduction , chapters, finding and conclusion .

ARC 606 -A : English Language Techniques

The aim of this course is to develop researcher ability to understand and interpretive English texts and literature, at the same time to present their knowledge in a perfect way. This would be by taking many items like: Grammar Skills, Vocabulary Skills, Speaking Skills Listening Skills, Reading Skills, and Writing Skills.

MSc. Courses

Architectural Design Specification

Semester 2:

ARC-A 607 Climatic Environmental design

This course is constrain on the general following items : Provide Human Comfort, including thermal comfort, The impact of sustainable development in architecture and Identify new technologies in the building's design and provide a comfortable indoor environment.

In specific it constrain on :Introduction to climatic design architecture, Environmental analysis of buildings designed according to the climate, Thermal comfort and climate analyses, Vernacular architecture, Design of shading solar devices, Environmental Treatments in hot dry climate, passive and effective treatments and renewable energies buildings depends on renewable energies. Natural and mechanical ventilation: achievement of natural ventilation in buildings. Daylighting, Integration between daylighting and artificial lighting.

ARC-A 608 Theory of Architecture

The course aims to develop and expand the student's knowledge about theory of architecture through two basic subjects, **First:** Functionalism , Structuralism and post-structuralism , deconstruction Contemporary attitudes , Sustainable attitude, Future architecture, Motivated architecture **Second:** subject like Aesthetics and Architecture, Creativity in architecture, Space and Place making, design with community, design with /for people.

ARC-A 609-A: Research Applications

The aim of this course is to analyze student research paper according to scientific consideration**: Scientific writing:** Style of writings, academic wording, subjectivity and Objectivity in writing, skills of thinking and writing. How to write abstract, Introduction, full chapters, conclusions. Critique and analyze the previous knowledge in particular texts. **Student research proposal:** critique and analyze the student proposal: critique and analyze the previous

studies in student proposal texts, Hypothesis, Measurement techniques: types of scale measurement**.** Sampling, **Questionnaires Design:** Open & Closed Questions . **Interviews:** Types of Interviews Unstructured, Structured and Semi structure Interviews. **Statistical analysis**: Describing Data, Selecting Statistical Tests.

ARC –A 610 Islamic Architecture

The course aims to develop and expand the participant's knowledge base of the Islamic ideology with focus on Islamic architecture. Enhancing and emphasizing the students' critique, analytic and comparative approach**.** The course outline consists of three parts: First: Introducing the Islamic ideology. The formation of early Islamic ideology. Modern and contemporary Islamic ideology. Second: delving into the Islamic architecture study, Islamic arch: Concepts and implementation. Comparative study of the variety of civilizations and how their ideologies effected their architectural achievements. Study example: Aga Khan, how Islamic intellectual trend effects architecture. Third: discussing the student reports.

ARC-A 611 Elective course (1)

ARC-A 612 Elective course (2)

- Islamic and Arabic architecture.
- Vernacular architecture.
- Sustainability in architecture. Green architecture.
- Environmental psychology.
- Complex system in architecture,
- Building management.
- Formal transformation In Non-Euclidean Geometry.
- Smart materials.
- Criticism in Architectural Education.
- Advanced Building Technologies.
- Aesthetics of Architecture.

ARC-A 613 English Language Techniques

The aim of this course is to develop researcher ability to understand and interpretive English texts and literature, and to enhance their Communication Skills This would be by taking many items like: Technical Vocabulary, Essay Writing, Business Writing, Technical Writing, Effective Communication, and Presentation Skills.

MSc. Courses

Urban Design Specification

First semester

ARC 601-U Housing

The aim of this course is a knowledge the student with new theories in Housing, Moreover housing problems, and the proposed solutions: Variables affecting housing sector.

Reasons for the failure of housing projects-Behavioral school and its role in housing ,Sustainability in housing, Housing development. Sustainable house, and affordable housing, Smart houses. Squatters settlements, Spontaneous settlements. Slum areas, Housing upgrading. Housing subdivision and re-subdivision, Structuralism in housing, Phenomenology and the dwelling.

ARC-U 602 Landscape Design

This course constrain on sustainable Landscape Designs through many items: Benefit of sustainable landscape, Strategies for sustainable design, evaluating landscape Sustainability (Functional, Cost-efficient, Visually pleasing, Environmentally friendly, Minimal resource input, Maintainable), Brainstorming alternative layouts and design ideas. The role of Regulations in determine suitable and comfort landscape, Landscape design planning Design considerations, Site information, Types of Plants and other site elements.

ARC-U 603 Climatic Urban Environment

This course is constrain on the general following items: • The Importance of provide thermal comfort in outside spaces: The benefiting from the site characteristics in the development

of the design program and design alternatives, reach to urban designs that minimize the impact on climate change.

In specific it constrain on: Outside thermal comfort & climate analyses, : achieve thermal comfort in outside spaces in hot, dry climate . Site analysis: : the importance of site analysis in urban design. Effect of climate change in urban design. Impact of climate change in the designs of cities master plans. Urban heat island phenomenon, Examples of heat island phenomenon in Some World Cities. Urban design with climate: Examples of urban design responsive to the environment. Sustainable urban design: examples of sustainable urban design Renewable energy in urban design: Application renewable energies in urban design.

ARC-U 604 Urban design Theory

The course is an introduction to contemporary urban design and to the main theories and positions from the past five decades. Urban design integrates aspects from planning, architectural design, sociology, cultural studies, and urban history. A principal goal of the course is to tie a connection between theory and practice, and discuses of the impact of these theory in local urban design projects and Iraqi city developments.

General Definitions: the most important vocabulary and concepts in urban design. The most important theorists and intellectual Trends with a review of the most important theory and theorizing in urban design. The historical development of urban design - Urban expansion and urban sprawl. The emergence of the need for urban - planning theories. The Impact of industrial and technology revolution in the morphological change of cities. Theoretical concept - the beginning of the theory in the urban design, the most important sources of the urban design theory. Intellectual changes and transformation in the postmodern theory of urban design. Intellectual trends in theory – (linguistic, semiotics, structuralism, post-structuralism. Psychological Trends - behavioral – social. Philosophical Trends (rationality - experimental – phenomenology). Sustainable Trends (Smart Cities - Sustainable –Ecology).

ARC-U 605 Research Theory

Scientific Research definition .**Research Process:** Models of Research. Analysis accomplish thesis according to basic research methodology. **Research characteristic**: research abstract and Introduction characteristic and who to write. **Criteria of scientific research:** objectivity validity and reliability. **Previous literature:** types of literature, types of analysis techniques, & who to find gap in Knowledge, research concepts. **Research Questions**: how to find research Problem (types of problems) and sub Problems. **Research objective**: how to write

research objective. Conceptual framework and theoretical framework, who to determine concepts, indicators and variables. **Operational definition** : Operational definition define and the different between definition and concepts . **Variables:** Types of Variables , measurements and their types. **Hypotheses:** Hypotheses definition, types of Hypotheses. **Research design:** Research design chapter, Developing a Research Plan, Samples selection , Measurement Scales , Interview Method, Constructing Questionnaire . **Writing research paper**: What is scientific writing, How to write references, writing abstract, introduction, chapters, finding and conclusion.

ARC-U 606 English Language Techniques

The aim of this course is to develop researcher ability to understand and interpretive English texts and literature, at the same time to present their knowledge in a perfect way. This would be by taking many items like: Grammar Skills, Vocabulary Skills, Speaking Skills Listening Skills, Reading Skills, and Writing Skills.

MSc. Courses

Urban Design Specification

Second semester

ARC-U 607 Sustainable Urban design

The aim of this course is to identify students with urban sustainability, sustainable development, and sustainable urban design, with new theories in this field. Plus sustainable cities and eco systems.

Sustainability and Sustainable Development. historical review of sustainability. Reasons for Sustainable urban design. Sustainable development, and sustainable urban design. Ecological footprint, and sustainable urban scenarios. Sustainable strategies

biome miss. Metaphor and cities archetypes. Types of sustainable cities(Compact city and traditional city). Ecological city and garden city. Sustainable transport. Sustainable Landscape. Materials, water and garbage treatment. Traditional areas and conservation.

Urban design Strategies ARC-U 608

The course puts a target to act as a guide for planners, designers and decision-makers to help improve urban design in a dynamic, ever-changing urban environment, and put the design within a process of design strategy and experiences significant pressure for redevelopment and land use change. In this context, the purpose of the UDS is to promote good design outcomes that contribute to a coherent and appealing urban environment and encourage continuity, growth and change.

The UDS also acknowledges that future developments will need to achieve better environmental outcomes. Good urban design should ensure an attractive and interesting place. The UDS recognizes that the need to achieve good design outcomes at an individual site level should be balanced with a greater focus on collectively improving the quality of urban design through the strategy of the designer to put to each urban projects and the techniques the designer put to create the urban shape.

Course contain the following items: What is Urban Design Strategy – UDS, how it's deferent from Architectural design strategy. Fields of Urban Design, Influential and affected. What is "Philosophy of the City?" social epistemology? The intimate limits of local democracy, Justice and urban public health. Ideology & Strategy. Post-Everything. Architecture and Ideology, Ways of Dialogizing Architecture in the 19th and 20th centuries. Ideology of Modernism. Aesthetic Rationalism and Its cultural Respond. Contemporary-Urban-Strategies-and-Urban-Design-in-Developing-Countries, Urban Design Case Studies - City Urban Design Strategy. City center strategy, City Scope design strategy, Urban Design Case Studies - City Urban Design Strategy. Transformation of Design Strategies, Ideology of Designer. New technology as new ideologies. Social Assembly and Designer Individualism.

ARC-U 609 Analysis of Urban Design

Studies of urban environment analysis address the multiple links between spatial structure, use patterns, social and cultural meaning. Studies in this area develop models and morphologies of use, based on tools ranging from Graphic Information Systems to Space Syntax. Representing and modeling the spatial dimensions of behavior and use patterns become aspects of the formal description of built as well as virtual environments. This work may be closely linked with cultural and behavioral studies, The main tool in the study will be space syntax method in studying city structure, Iraqi city centers will be examples in the analytic study.

The course is aimed, Architect, urban designers, planners. they will be able to use and understand the method of space syntax in analyzing city and urban structures and their explain their relation to the social infrastructure.

ARC-U 610 Research Applications

The aim of this course is to analyze student research paper according to scientific consecration **: Scientific writing:** Style of writings, academic wording, subjectivity and Objectivity in writing, skills of thinking and writing. How to write abstract, Introduction, full chapters, conclusions. critique and analyze the previous knowledge in particular texts. **Student research proposal** : critique and analyze the student proposal : critique and analyze the previous

studies in student proposal texts , Hypothesis , Measurement techniques: types of scale measurement . Sampling , **Questionnaires Design :** Open & Closed Questions . **Interviews:** Types of Interviews Unstructured ,Structured and Semi structure Interviews . **Statistical analysis** : Describing Data, Selecting Statistical Tests.

ARC-U 611 Elective course (1)

ARC-U 612 Elective course (2)

- Arabic and Islamic Cities.
- Smart City.
- Ecological City.
- Environmental psychology.
- Complex system in urban design.
- Urban management.
- Legislation and regulations in Urban Planning.
- (GIS) geographic information system.

ARC-U 613 English Language Techniques

The aim of this course is to develop researcher ability to understand and interpretive English texts and literature, and to enhance their Communication Skills This would be by taking many items like: Technical Vocabulary, Essay Writing, Business Writing, Technical Writing, Effective Communication, and Presentation Skills.

Ministry of Higher Education and Scientific Research

University of Technology

Department of Architecture

Subjects Description of doctorate Curriculum

2014-2015

Doctorate Philosophy degree in Architecture

Ph.D. Courses

Semester 1:

ARC 701 Architecture Philosophy

This course consist of two parts, **Frist Part** is Theoretical and **Second Part** is Practical depends on the student's own concept and vision among other architecture concepts.

Part (1) conclude three sections: **First section :** Five concepts: Logic, philosophy, logic, method, thought, language .and Philosophy: science of architecture, philosophy of architecture, science and cognitive . **Second section :** Thought , architecture philosophy and the philosophy of reality. Method, Philosophy induction devise architecture movements. **Third section**: Architecture language, multiple Architectures: (problematic vision) or one architecture (one problem).

Part (2) conclude: lectures and exercises: Method ; correspond square. Issue lecture; How can identify the four parties in the interpretation of architecture and its movements .Method ; Correlation & correspond square method.

ARC 702 Research Theory

Originality in research: Importance of originality, Criteria originality. Review on Research Process,Research and Design Cooperation: Purposes and Occasions, Side Effects of Cooperation , Explicit Knowledge, Tacit Knowledge. Abdicative reasoning: Abduction in science, Deduction and abduction , Doubt and certainty . **Building theory**: Elements of Scientific Theories , Building Theory Process, Criteria for Good Theory. Theoretical Framework &research design

Research Design **Observation:** Observational Research, Systematic Observation, On the distinction between observation and interpretation, Validity and Reliability of Observation, Testing Theories with Observable Evidence. **Mixed Research (qualitative, quantitative):** Classification of combinations of research methods, Evaluative approach, Mixed-method evaluation.

ARC 703 Urban design Theory

The course concern with theories and dimensions of urban design: Changes and transformation in urban design. Urban design today. Contextually in urban design. Social dimension. Morphological dimension. Perceptual dimension. Sense of place. Visual dimension. Functional dimension. Temporal dimension.

ARC 704 Architecture and Environment

This course constrain on: the criteria of obtain appropriate design for suitable climate. Who to fulfil comfort a complete image about architecture by Comprehensive sustainable architecture. Environmental design treatments in traditional buildings and its relationship with Thermal comfort. Limits of Thermal comfort for contemporary human being and its effect on creating contemporary sustainable architecture . Scientific basis for architecture traditional vocabulary performance climatically. Natural ventilation in designing buildings that respond to the climate. Functioning Traditional architectural vocabulary in contemporary. Analysis of buildings in hot climate. Construction materials as a part in sustainable design . Discussions about sustainable thinking as a methodology for architecture that responds to the climate.

ARC 705 Elective course (1)

ARC 706 Elective course (2)

- Intellectual thinking in Islamic architecture.
- History of Epistemology evolution.
- Theory of Criticism.
- Ethical philosophy in architecture.
- Urban Morphological Transformation.
- (GIS) geographic information system.
- Urban services Systems.

ARC 707 English Language Techniques

The aim of this course is to develop researcher ability to understand and interpretive English texts and literature, and to enhance their Communication Skills This would be by taking many items like: Technical Vocabulary, Essay Writing, Business Writing, Technical Writing, Effective Communication, and Presentation Skills.

Ph.D. Courses

Semester 2:

ARC 707 Theory in Architecture

The course constrain on theory on architecture from philosophical viewpoint and through two parts**. Part 1**: Positivism Antipositivism, Functionalism, Structuralism Interactionism Conflict theories. **Part 2**: different subjects like, Questions of space, the authority of the architect, Environmentally Challenged.

ARC 708 Architectural Research Philosophy

The aim of this course is to enlightenment on the evolution of science Epistemology and research methodology, the course items are: Epistemology and Methodology. Philosophy of Research. Positivism Ant positivism & Post-Positivism, The Promise of a New Evolutionary Worldview: A new Ontology. On The Karl Popper's evolution epistemology: Popper's epistemological model, Popper's model for architectural education. Ethics in Research

ARC 709 Thoughts in Architectural Technology

This course consist on three parts: **Part (1)**; Technology and thought : a- Technology and thought evolution in architecture (nature modeled on machine, Descartes and Newton thoughts ,architecture determinism thoughts ,Intellectual confusion technology phase , computer age) ,Machine modeled on nature (change patterns phase ,Bio technology phase) . b- Technology driven architecture , Technology analysis , thought and action Dualism , Manifestation of technology (technology as objects, technology as process , technology as Knowledge . **Part (2)**; City and Technology ; Digital city (virtual city , modern city , city development and new century cities). **Part (3);** a- Sustainable architecture and High technology : intellectual date of digital architecture (Immaterial dimension , Nonstandard dimension , Interactive dimension , performance) , new materiality (digital fabrication and open form , relationship between designers thought , manufacturing , architectural production . b- sustainable construction : element of sustainable construction building materials , process, structural system) , Principles of sustainable construction (Conserve ,Reuse, Recycle, Protect nature ,Non-toxics, economies and quality).

ARC 710 Research Proposals Seminars

The aim of this course is to orient student toward the way to accomplish a whole thesis research; by doing many seminars about student's topics Problem area for student. Literature review. Theoretical framework, case studies (samples), measurements tools , its validity and reliability .

ARC 711 Elective course (1)

ARC 712 Elective course (2)

- Intellectual thinking in Islamic architecture.
- History of Epistemology evolution.
- Theory of Criticism.
- Ethical philosophy in architecture.
- Urban Morphological Transformation.
- (GIS) geographic information system.
- Urban services Systems.

ARC 713 English Language Techniques

The aim of this course is to develop researcher ability to understand and interpretive English texts and literature, and to enhance their Communication Skills This would be by taking many items like: Technical Vocabulary, Essay Writing, Business Writing, Technical Writing, Effective Communication, and Presentation Skills.