Sana'a University
Faculty of Engineering

Master of Science in Architectural Engineering

Program Specifications

June - 2021

Faculty of Engineering, Sana'a University

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University of Sana'a
Faculty of Engineering
Department: Architectural Engineering
Title of the Program:
Master of Science in Architectural Engineering

Program Specification

1. Program Introduction/Description

This program is designed to provide in-depth theoretical knowledge and research in architecture engineering field. Courses encompasses the cores and electives, which mainly on architectural design, urban planning and housing

2. Program Identification and General Information

Program Title	Master of Science in architectural Engineering
Awarding Institution	Sana'a University
Department	Department of architectural Engineering
Other Departments with major Teaching Contributions	-
Language of study	English and Arabic Language.
Date of Specification Preparation/Revision	May 2021
Mode of Study	Full time
Study System	Courses& Thesis
Main Location of Study	Faculty of Engineering/Sana'a University
Mode of Delivery	Full-time
Study Duration	Minimum: 2 Academic years (Two terms each, full-time) Maximum: 3 Academic years (two terms each - full time)
Award(s) or Final Award	Master of Science in architectural Engineering
Qualification required to join the program:	BSc. in architectural Engineeringor any other equivalent field
Minimum grade requirements to enroll in the program	Good 65%
Other admission requirements	Detailed below
Name of the program coordinator	Dr. Fadhl Mohamed Alwaraqi
Approval date:	

3. Program Curriculum Committee

Dr. Fadhl Mohamed Alwaraqi Dr. Samir Mohsen Al-Sirry DR. Wael ALaghbari Dr. Amal Abdul Karim Al-Arashi Dr. Ahmed Ghalib Farea AL-Sharjabi	Dr. Mohammad Abdulla Algorafi Dr.Saif .Abdullah Ahmed. AL-Kubati Dr.Samira Saleh Hussein Alshawesh Dr. Mohammed Mohammed Ahmed Al - Alifi

Head of the Department	Quality Assurance Unit	Dean of the Faculty	Academic Development Center & Quality Assurance
Dr. Samir Mohsen Al-Sirry	Assoc. Prof. Dr. Mohammad Algorafi	Prof. Dr. Mohammed AL-Bukhaiti	Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

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4. Vision, Mission & Aims of the University

Vision of the University

Sana'a University aspires to achieve a national leading role in teaching, learning, scientific research and community service; and to be among the best regional universities and the foremost house of expertise and think tank in Yemen.

Mission of the University

To contribute to the sustainable development efforts by providing an accredited higher education environment and excellent research services within a fruitful national partnership based on transparency, professionalism and creativity.

Aims of the University

The University seeks to achieve the following objectives:

1. To provide specialized and in-depth academic opportunities for students in different fields of knowledge to meet the country's needs of specialties, technicians and experts, with special focus on the following:
2. To boost the level and quality of preparation and qualification tasks.
3. To create a general culture aiming at developing the elements of sound Islamic personality and the proper cognitive and scientific training.
4. To stabilize the true Islamic vision emanating from the broad horizons of Islamic knowledge and its perception of the universe, man and life.
5. To develop innovative and critical scientific thinking skills.
6. To provide students with the required knowledge and scientific and applied skills for solving problems effectively and efficiently.

5. Vision, Mission & Aims of the Faculty

Vision of the Faculty

To excel in engineering education & scientific research with distinction at the local and regional levels.

Mission of the Faculty

To provide excellent and accredited engineering education to meet the development needs and match the labor market requirements locally and regionally

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5. Vision, Mission & Aims of the Faculty

Aims of the Faculty

1. To offer study programs in various fields of knowledge and equip students with required knowledge and scientific and know-how skills to utilize them in resolving problems effectively and efficiently.
2. To develop positive trends towards engineering science and its accelerating developments and enable students to use the techniques and methods of conducting scientific research in engineering fields.
3. To develop skills of scientific, innovative and critical thinking as well as the concept of continuous self-education.
4. To strengthen scientific ties with national and international colleges, scientific bodies, and research & development centers.
5. To provide technical and specialized studies and consultations to various state bodies and institutions, both public and semi-public, and utilize them in resolving the environment and society issues to promote sustainable development.
6. To develop a spirit of co-operation, group work, effective leadership, sense of responsibility, and ethical commitment.

6. Mission & Aims of the Department

Mission of the Department

To promote the architectural engineering education by adopting specialized and scientific curricula and rich Yemeni architectural heritage and scientific research.

Aims of the Department

1. To enable graduates to use their imagination, creative thinking, innovation and leadership in architectural work
2. To provide graduates with knowledge and advanced techniques in architectural design and urban planning
3. To enable graduates to collect data, identify problems, apply analyses, and draft work strategies
4. To provide graduates with practical efficiency related to communication skills and profession ethics
5. To graduate architects who are able to follow up the requirements of profession

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6. Mission & Aims of the Department
changes; using professional capacity, technological skills, and personal views; respecting profession ethics, including cooperation and communication; providing community with services; leading and directing the community

7. Vision, Mission & Aims of the Program
Vision of the Program
To be distinguished post-graduate program education & scientific research in architectural engineering, locally and regionally.
Mission of the Program
To graduate distinguished Masters students in the field architectural engineering through a strong academic program, qualified staff, and suitable research environment that meet local development requirements as well as and regional labor market needs.
Aims of the Program
1. To provide specialized studies and encourage fundamental and applied research in different architectural engineering disciplines.
2. To bridge the gap between the academic educational and industrial and technological environment.
3. To provide graduates with up-to-date advanced knowledge and skills needed to create high-quality systems, attain the excellence in architectural engineering and solve architectural design and urban planning problems.
4. To contribute effectively to the architectural engineering profession by applying ethical practices and communication skills, sharing innovative and clear ideas and pursuing further education through lifelong learning
5. To graduate researchers in architectural engineering disciplines who can pursue further studies and contribute to the scientific research community.

8. Program Standards& Benchmarks
Program Standards
1. Post-graduate Studies Rules and Regulations of the Ministry of Higher Education and Scientific Research, Yemen.
2.
Program Benchmarks
1. Master of Science in Architectural Engineering, United Arab Emirates University ,UAE
2. Master of Architectural Engineering, The University Jordan, Jordan

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8. Program Standards& Benchmarks
3. Master of Architectural Engineering, University of Melbourne , Australia
4. Master of Science in Architecture (M Sc) degree , American University in Cairo, Egypt
5. Master of Architecture Engineering And Urban Planning , Libyan Academy for Postgraduate Studies ,Libya
6. Master of Architecture Engineering , University, Palestine

9. Summary of Similar Programs (Benchmarks) for architectural Engineering Program

	The Similar Programs (Benchmarks)						**Current Program**
	1st Program	2nd Program	3rd Program	4th Program	5th Program	6th Program	
Program Title	Master of Science in Architectural Engineering	M.Sc. Architecture Engineering	Master of Architectural Engineering (MC-ARCHENG)	Master of Science in Architecture (M Sc)	M.Sc. Architecture Engineering	M.Sc. Architecture Engineering	MSc. in ArchitecturalEngineering
Faculty	College of Engineering	School of Engineering	School of Design	School of Sciences and Engineering	School of Engineering Sciences	Faculty Of Graduate Studies	**Faculty of Engineering**
University	United Arab Emirates University	The University of Jordan	University of Melbourne	The American University in Cairo	Libyan Academy for Postgraduate Studies	An-Najah National University	**Sana'a University**
Country	UAE	Jordan	Australia	Egypt	Libya	Palestine	**Yemen**
Type of Program	Courses + thesis	Courses + thesis	Courses	Courses + thesis	Courses + thesis	Courses + thesis	**Courses + thesis**
Study methods in the program:	Full and part-time regular	Full-time	Full and part-time regular	Full-time	Full-time	Full-time	**Full-time**
Number of semesters	Full time 12-24 months	4	6	4	4	4	**4**
Total Credit Hours (without Thesis)	**21 credit hours**	**33**	**350 credit points**	**33**	**34**	**30**	**36 credit hour**
No. of Compulsory Courses (with Faculty requirement)	**4**	**6**	**8**	**5**	**6**	**6**	**5**

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9. Summary of Similar Programs (Benchmarks) for architectural Engineering Program

Credit Hours for Compulsory Courses	**12**	**18**	**100 points**	**15**	**18**	**18**	**15**
No. of Elective Courses	**3**	**2**	**250 points**	**3**	**6**	**4**	**5**
Credit Hours for Elective Courses	**9**	**6**	**-**	**9**	**16**	**12**	**15**
Complementary courses to join the program and their number	--	--	--	--	--	--	-
Credit Hours for Thesis	**9**	**9**	**-**	**9**	**6**	**6**	**6**
Total Credit Hours for courses & Thesis	**30**	**33**	**350 points**	**33**	**40**	**36**	**36**
The period for thesis completion	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**Min.=2 semesters Max.=4 semesters**
The min. period to complete the program	-	**2 years**	**3-years**	**N/A**	**2 years**	**2 years**	**4 semesters**
The max. period to complete the program	-	-	**6 years**	-	**3 years**	-	**6 semesters**

10. Program Intended Learning Outcomes (PILOs)

A. Knowledge and Understanding

Upon successful completion of the Master of Science in Structural Engineering Program, graduates should be able to:

A1.	Demonstrate in understanding of knowledge of applied mathematics and engineering science to the field of architectural engineering.
A2.	Discuss concepts, principles, techniques and theories in the areas of building architecture, urban planning and design, contemporary architecture in the Islamic context and environmental design.
A3.	Define Knowledge of current practice contexts, including environmental, technological, and regulatory and project-delivery systems.
A4.	Demonstrate critical thinking towards architectural current paradigms towards making an impact in the future of the architectural domain.

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10. Program Intended Learning Outcomes (PILOs)

B. Intellectual Skills

Upon successful completion of the Master of Science in Structural Engineering Program, graduates should be able to:

B1.	Evaluate engineering systems in high performance built environment according to relevant regulations and codes.
B2.	Evaluate and develop the cognitive and creative skills in design concept that demonstrates the exercise of theoretical reflection, critical choice, imagination and professional responsibility, through the exploration, testing and refinement of different technical and aesthetic alternatives.
B3.	Employing the skills of higher thinking, critical and creative thinking, and practicing scientific thinking and logical analysis in investigating, diagnosing and addressing the issues and problems of architecture engineering, urban planning and design.

C. Practical and Professional Skills

Upon successful completion of the Master of Science in Structural Engineering Program, graduates should be able to:

C1.	Apply advanced research methods to the analysis and solution of engineering problems.
C2.	Develop comprehensive engineering systems, highly specialized components, or appropriate processes for built environment.
C3.	Apply advanced knowledge in a specialized and emerging area in high performance built environment.
C4.	Use relevant techniques in the fields of environmental design, technology and sustainability in architecture engineering.

D. Key Transferrable Skill

Upon successful completion of the Master of Science in Structural Engineering Program, graduates should be able to:

D1.	Demonstrate ethical principles, awareness of professional and ethical responsibility as well as knowledge of the standards utilized in related fields.
D2.	Conduct independently and communicate research that advances and extends knowledge and scholarship in related fields.
D3.	Own intellectual independence, with initiative and creativity in new situations and/or for further learning, plan and execute original research with full responsibility and accountability for personal outputs.
D4.	Demonstrate interest in independent self-learning and continuous professional development, demonstrates commitment to acquire and generate unique knowledge and skills, and proposes new ideas and programs that contribute to the development of architecture engineering.

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11. Teaching Strategy to Achieve Program Learning Outcomes		
ILOs	**Teaching Strategy**	**Assessment Methods**
A1	Lectures, Seminars, Active learning, Self-Learning, Independent study, Computer hands-on sessions, Laboratory works	Written Exam, Assignments, Quizzes, Oral discussion, Experimental and field work, Laboratory Report
A2		
A3		
A4		
B1	Lectures, Analysis and Problem Solving, Seminars, Project supervision, Laboratory works, Self-Learning, Simulation exercises, independent study, Brain storming, Research Presentations	Written Exam, Assignments, Quizzes, Course project and Course research, Oral discussion, Experimental and field work.
B2		
B3		
C1	Lectures, Analysis and Problem Solving, Seminars, Project supervision, Laboratory works, Self-Learning, Simulation exercises, independent study, Brain storming, Research Presentations	Written Exam, Assignments, Quizzes, Course project and Course research, Oral discussion, Experimental and field work.
C2		
C3		
D1	Dissertation supervision, independent study, presenting reports, Brainstorming, presenting researches, Publish research papers Survey	Written research proposal, thesis and publication, Written Exam, Assignments, Experimental and field work, laboratory report, survey, presentation, written report.
D2		
D3		
D4		

Teaching Strategy	**Description of the Main Strategy Used**
Lectures.	These are interactive lectures weekly conducted according to course plan in a classroom and supported with variety of teaching formats including, lectures and multimedia presentations, use of whiteboard and solved examples, and class discussions, in which concepts, approaches, and case studies are presented, explored, and shown students what they need to know.
Independent study	Independent study is an individualized learning experience that allows students to select a topic focus, define problems or questions, gather and analyze information, apply skills, and create a product to show what has been learned.

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Teaching Strategy	Description of the Main Strategy Used
Self-Learning.	Students are encouraged to undertake independent study to both supplement and consolidate what are being learned.
Analysis and Problem Solving.	The study of architectural engineering involves applying knowledge and problem-based learning. This allows students to become more active in their learning as they work out wet information, they need to find out how to solve a particular problem. They can work out a problem collaboratively, practice research as well as testing different components to come up with a valid solution.
Presentations/ Presenting researches	Students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Presentation sessions provide an opportunity to address questions, queries, and problems.
Project supervision	The teacher needs to set advance work for students, and then have the students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Project sessions provide an opportunity to address questions, and problems.
Brain storming	Brainstorming is an effective technique for generating lists of ideas and creating interest and enthusiasm for new concepts or topics. Brainstorming provides teachers and students with an overview of what students know and/or think about a specific topic. Students can use brainstorming to organize their knowledge and ideas.
Dissertation supervision	Guiding, reviewing, and approving the MSc research work at all stages.
Publish research	Guiding and reviewing MSc student to writing research paper to be accepted for publication.
Seminar	The teacher needs to set advance work for a selected number of students, and then have the selected students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Seminar

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Teaching Strategy	Description of the Main Strategy Used
	sessions provide an opportunity to address questions, queries, and problems.
Research activities	Research-led activities envisage activities in which students learn about current research in the discipline and are frequently an audience. The emphasis is put on the research content.
Survey	Searching and investigating previous scientific papers, studies, reports, thesis, and case studies.

Assessment Strategy	Description of the main strategy used.
Written Exam	Mid-term test is conducted in the 8thweek and final exam is conducted at the end of each course. Both tests are closed or open book, notes and resources. At least two quizzes must be done through the course.
Oral Discussion	To know the knowledge of the students.
Presentations	For Final Results displaying, to enhance the level of students in different subjects.
Quizzes	The entire assessment of Quizzes activities during the teaching period of each course.
Reports	To demonstrate the personal skills, practical expertise, communication skills, report writing skills, and team work expertise they are expected to be learned and gained through their education.
Experimental and field work	For evaluation, to demonstrate the personal skills, practical expertise, communication skills, report writing skills, and team work expertise they are expected to be learned and gained through their education.
Assignments	The entire assessment of coursework activities during the teaching period of each course (which includes group and individual work, tests and presentations, etc.)
Written research proposal	To assess the MSc student ability to commence and conduct his/her research.
Thesis and publications	To assess the entire acquired knowledge and skill through the MSc thesis and publications.

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12. 10. Intended Learning Outcomes Mapping:

See Annex 10

13. Program Structure

Program Requirement	No. of Courses	Credit Hours	%
Complementary Courses	-	-	
Faculty Requirement	1	3	8%
Compulsory Courses	4	12	33%
Elective Courses	5	15	42%
Thesis	-	6	17%
Total		36	100%

Complementary Courses (00 hrs)

No	Course Code	Course Title	Lec.	Tut.	Pr.	Total C.H.	Prerequisites
1							
2							
3							
4							
5							
6							
Total						**00**	

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	Faculty Requirement (1 course, 3 CH)						
No	**Course Code**	**Course Title**	**Lec.**	**Tut.**	**Pr.**	**Total C.H.**	**Prerequisites**
1	FR501	Scientific Research Methodology	3			3	
	Total						

	Compulsory Courses (4 Courses, 12 CH						
No	**Course Code**	**Course Title**	**Lec.**	**Tut.**	**Pr.**	**Total C.H.**	**Prerequisites**
1		Arch. Design Theories	3			3	
2		Urban Planning	3			3	
3		Housing	3			3	
4		vernacular architecture	3			3	
	Total					**12**	

	Elective Courses (5 Courses, 15 CH) **Selected 4 courses from Architecture or Planning elective +1 course from general elective**						
No	**Course Code**	**Course Title**	**Lec.**	**Tut.**	**Pr.**	**Total C.H.**	**Prerequisites**
	Architecture Elective Courses(4 Courses, 12 CH)						
1		Environmental Design	3			3	
2		Architecture Technology	3			3	
3		Aesthetics and Architectural Criticism	3			3	
4		Architectural Conservation	3			3	
5		Contemporary Islamic Architecture					
	Planning Elective Courses(4 Courses, 12 CH)						

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6		Urban Design	3			3	
7		Urban Sociology	3			3	
8		Islamic city planning	3			3	
9		21th Century city planning	3			3	
10		Sustainability in architecture and urban planning					
	General Elective Courses(1 Courses, 3 CH						
11		Project Management	3			3	
12		Advanced Statistics	3			3	
	Total					-	

		MSc Thesis(6 CH)					
No	**Course Code**	**Course Title**	**Lec.**	**Tut.**	**Pr.**	**Total C.H.**	**Prerequisites**
	THISIS599	MSc Thesis				6	
	Total					**06**	

Thesis

The student must prepare and discuss aMSc Thesis by (6) credit hours.

Thesis and Its Requirements (if any)

1.Registration of the thesis:

(Requirements/conditions and procedures for registration of the thesis as well as controls, responsibilities and procedures of scientific guidance)

- Completion of all required Compulsory & Elective Courses with average grade more than or equal to 75% .
- Completion of all university requirements.
- Field of Research and precise research topic with short Description andsuggested time plan.
- First Department Seminar.
- Decision letter (Supervisors) of acceptance of the research topic.

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Thesis
• Thesis work should be done in at least 2-semesters. • Thesis work should be done in at most 4-semesters. • Any further requirements and controls based on post-graduate deanship regulations.
2.Scientific Supervision: (The regulations of the selection of the scientific supervisor and his/her responsibilities, as well as the procedures/ mechanisms of the scientific supervision and follow-up)
- At most 2-supervisors are selected for the supervision of a thesis. - At least 1-Associate (or Full) Professor is appointed as supervisor either from the department or from another department outside the faculty. - Any Assistant Professor appointed as supervisor should have at least 4-year experience in the field of research and have published at least one paper. Candidates may apply for one-year extension (full-time) for completion of the thesis to the Postgraduate Program Administration at the Faculty of Engineering, which will be granted if the candidate provides a valid reason for extension. The supervisor responsibilities are - : - Help and assist the candidate/researcher in preparing the research plan. -Guide the candidate to adhere to certain standards of academic integrity and research ethics، including combating plagiarism. - Monthly، follow up and meeting with the researcher (at least one meeting per month), - Guide the researcher at every step to be done during thesis work، - Write follow-up (progress report) after each meeting - Write a follow-up (evaluation report) every semesters. -The supervisor shall submit copies of these reports to the Postgraduate-Program coordinator، the Head of the Department and the Head of the Faculty Post-graduate. - Write the final thesis acceptance report in order to prepare the final department seminar and then initiating the preparation for thesis presentation، defense and approve. The candidate/student responsibilities are - : - Student present his/her accomplishment at the end of every semesters - plan and actively pursue the research; - identify and deal with any research-related problems; - comply with administrative requirement;

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Thesis
- meet ethical guidelines; - take responsibility for the final form of the thesis - A thesis or research portfolio is the outcome of independent research، or creative activity conducted under supervision. - The length of a 6 credit hours thesis or research portfolio will be appropriate to the discipline and must not exceed 30,000 words, including bibliography, footnotes or endnotes and essential appendices, unless specific permission has been granted by the Department.
3.Thesis Defense/Examination: (The regulations for selection of the defense/examination committee and the requirements to proceed for thesis defense, the procedures for defense and approval of the thesis, and criteria for evaluation of the thesis)
- A thesis proceeds for defense following completion of: - At least one research paper is accepted in a journal in the field of research. - Final acceptance letters provided by the supervisor(s) and the department final seminar committee (at least 3-department members)، - The examination committee should consist of - : - One -Associate (or Full) Professor specialized in the field of research from an external university ، - One-Associate (or Full) Professor from the department of electrical engineering in addition to the supervisor of the thesis. - A session for presentation، defense and approval of the thesis should be done based on the following- : - At least two members of the examination committee accept their assignment and reply by acceptance letter and approve the thesis for defense within one month. - The session of defense should be declared within two weeks after receiving of examination committee members' approval letters.

14. System of Study	
Type of program	Courses +Thesis
Study methods in the program:	Full time
The period to complete the program	Min. 2 Years (4 Terms) Max.3 Years (6 Terms)
Total Credit Hours for Courses + Research	36

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15. Study Plan

FR stands for Faculty Requirements.
CE5XX stands for Architecture Department Requirements.

First Year		First Semester						
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Tut.	Pr.	Total C.H.	
1	AE601	Arch. Design Theories	نظريات تصميم معماري	3			3	
2	AE602	Urban Planning	تخطيط عمراني	3			3	
3	AE603	Housing	اسكان	3			3	
4	AE604	vernacular architecture	عمارة محلية	3			3	
5	AE605	Scientific Research Methodology	مناهج بحث علمي	3			3	
		Total Credit Hours					**15**	

First Year		Second Semester						
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec	Tut.	Pr.	Total C.H.	
	FR501	Elective 1	اختياري1	3			3	
1	AE606	Elective 2	اختياري2	3			3	
2	AE607	Elective 3	اختياري3	3			3	
3	AE608	Elective 4	اختياري4	3			3	
4	AE609	Elective 5	اختياري5	3			3	
		Total Credit Hours					**15**	

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Second Year			First Semester					
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Tut.	Pr.	Total C.H.	
	AE701	MSc Thesis					3	
	Total Credit Hours						3	

Second Year			Second Semester					
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Tut.	Pr.	Total C.H.	
		MSc Thesis					3	
	Total Credit Hours						3	

Architecture Elective Courses (4 Courses, 12 CH)
(Selected from the courses shown below)

No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec	Tut.	Pr.	Total C.H.	
1	AE606	Architectural and urban Conservation	الحفاظ المعماري والعمراني	3			3	
2	AE607	Environmental Design	التصميم البيئي				3	
3	AE608	Architecture Technology	تكنولوجيا البناء	3			3	
4	AE609	Aesthetics and Architectural Criticism	علم الجمال والنقد المعماري	3			3	
5	AE610	Contemporary Islamic Architecture	العمارة الإسلامية المعاصرة	3			3	
	Total Credit Hours						12	

Head of the Department Dr. Samir Mohsen Al-Sirry	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

Program Specification

Planning Elective Courses (4 Courses, 12 CH) (Selected from the courses shown below)				Second Semester				
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Tut.	Pr.	Total C.H.	
1	AE610	Urban Design	التصميم الحضري	3			3	
2	AE611	Urban Sociology	علم الاجتماع الحضري	3			3	
3	AE612	Sustainability in architecture and urban planning	العمارة والتخطيط العمراني المستدام	3			3	
4	AE613	21th Century city planning	تخطيط مدن القرن الواحد والعشرين	3			3	
5		Islamic city planning	تخطيط المدن الإسلامية					
		Total Credit Hours					**15**	

General Elective								
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec	Tut.	Pr.	Total C.H.	
1	AE614	Project Management	ادارة مشاريع				3	
2	AE615	Advanced Statistics	احصاء متقدم				3	
		Total Credit Hours					**12**	

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Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

Program Specification

16. Admission Requirements:

1. Bachelor of Architectural Engineering Certificate with not less than 65 % passing ratio, or equivalent.
2. Interview
3. TOEFL / IBT:60
4.ICDL (Computer Skills):
5.Arabic Language:
6. Student number capacity of 10 students per year
7. Transfer Requirements, and Courses Equivalency
8. Annex -13: shows the Admission Requirements for the Program.

17. Graduation Requirements:

Student attendance should not be less than 75%.
Student will graduate after successfully passing the 30 credit hours coursesand6 credit hours Research.
Student must achieve a minimum average score for all courses is 75% degree
Minimum score for any student to pass any credit hours course is 65% degree.
Grading System: From 90% to 100% of total marks Excellent From 80% to less than 90% Very Good From 75% to less than 80% Good From 65% to less than 75% Pass Less than 65% Poor/Fail

18. Learning Resources, Facilities, and Equipment for Running the Program

Learning Resources.

Policies and Procedure for providing and quality assurance of learning resources textbooks, references and other resource materials, including electronic and web-based resources, Journal Database, etc.

- textbooks, reference

Library upgrading necessary, List of required new publications to be provided by Master Program teaching staff

Electronic Library (Existing, allows access to international research papers and publications).

Facilities and Equipment

Policies and Procedure for providing and quality assurance of Facilities and Equipment (Library, laboratories (Structure, material Labs), medical facilities, classrooms, etc.).

List of laboratories

Material Engineering Laboratory (Upgrading necessary)

Computer Laboratory

Head of the Department Dr. Samir Mohsen Al-Sirry	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
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Program Specification

19. Teaching staff:				
	Professor	**Associate Professor**	**Assistant Professor**	**Technicians Assistants**
Required Number				
Available Number	3	7	4	6
Note:				

20. Program Management and Regulations

1. Program Management

1.1 Program Structure

(Including boards, councils, units, committees, etc.)

Architectural Engineering Department Board
Postgraduate Studies Administration
Vice Dean for Postgraduate Studies
College of Engineering Board
Vice Presidency of the University for Postgraduate Studies

1.2 Stakeholders' **Involvement**

Describe the representation and involvement of stakeholders in the program planning and development. (Students, professional bodies, scientific societies, alumni, employers, etc.)

The stakeholders were involved in designing the program, including universities, research centers, the public and private sectors, through their participation in a workshop as well as in responding to and submitting a questionnaire.

2. Program Regulations

Provide a list of related program regulations, including their link to online version: admission, study and exams, recruitment, appeals and complaint regulations, etc.)

Decision of the Presidency of the Council of Ministers No. 40 of 2008
Decision of the Presidency of the Council of Ministers No. 141 of 2008
Graduate Studies Guide to Sana'a University

Head of the Department Dr. Samir Mohsen Al-Sirry	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

Program Specification

21. Evaluation of Program Quality Matrix:			
Evaluation Areas/Aspects	**Evaluation Sources/References**	**Evaluation Methods**	**Evaluation Time**

Note:
Evaluation Areas/Aspects (e.g., leadership, effectiveness of teaching & assessment, learning resources, partnerships, etc.)
Evaluation Sources (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others (specify)
Evaluation Methods (e.g., Surveys, interviews, visits, etc.)
Evaluation Time (e.g., beginning of semesters, end of academic year, etc.)

22. List of Annexes

Annex (1)	Academic Standards Curriculum Criteria of Accreditation Board for Architectural Engineeringprogram.
Annex (2)	Survey of names of Similar Accredited Programs at International Universities (Benchmarks) for Structural EngineeringPrograms.
Annex (3)	Survey of Intended Learning Outcomes for similar Accredited Architectural EngineeringPrograms at International Universities.
Annex (4)	Summary of similar Programs (Benchmarks) for Master of Science in Architectural Engineering Program.
Annex (5)	Survey of course names of Similar Programs.
Annex (6)	Survey/Mapping of Vision, Mission and Objectives of similar Accredited Programs at International Universities (Benchmarks) for Masters of Science in Architectural Engineering programs.
Annex (7)	Mapping of the mission and objectives of the program with the vision, mission and objectives of faculty, and the university.
Annex (8)	Main Themes/Sub-Themes with Relative weight for Program (if need)
Annex (9)	PILOs Distribution to General Themes for Program (if need)
Annex (10)	Matrix of mapping program P- ILO's with courses
Annex (11)	Mapping the benchmarks with PILO's (if need)
Annex (12)	Mapping Program's Goals with Intended Learning Outcomes

Head of the Department Dr. Samir Mohsen Al-Sirry	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
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Program Specification

23. Attachment of Courses specification and Syllabi of the Program

Head of the Department Dr. Samir Mohsen Al-Sirry	Quality Assurance Unit Assoc. Prof. Dr. Mohammad Algorafi	Dean of the Faculty Prof. Dr. Mohammed AL-Bukhaiti	Academic Development Center & Quality Assurance Assoc. Prof. Dr. Huda Al-Emad
Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas			

Program Specification

ملحق (1) المعايير الأكاديمية للمحتوى لهيئة الاعتماد المقترحة لبرنامج ماجستير الهندسة المعمارية

(Annex-1): Academic Standards Curriculum Criteria of Accreditation Board for Master of Science in Architectural engineering program

Program Specification

ملحق (2) مسح أسماء البرامج المعتمدة المماثلة لبرنامج ماجستير الهندسة المعمارية

Annex (2) Survey of names Similar Accredited Programs at International Universities (Benchmarks) for Master of Science in Architectural Engineering

#	The Academic Program اسم البرنامج المماثل	The University الجامعة	The Faculty الكليّة	The Department القسم	The Country الدولة	Program Accrediting Body جهة اعتماد البرنامج	Degree Award at Program Completion الدرجةالتي يمنحها البرنامج للخريج	Year of accreditation سنة الحصول على الاعتماد	Type of program
The 1st Program البرنامج الأول	Master of Science in Architectural Engineering	United Arab Emirates University	College of Engineering	Architectural Engineering Department	UAE	ABET	MSc Architectural Engineering	------	Courses + Thesis
The 2nd Program البرنامج الثاني	M.Sc. Architecture Engineering	The University of Jordan	School of Engineering	Department of Architecture Engineering	Jordan	-	M.Sc. Architecture Engineering	------	Courses + Thesis
The 3rd Program البرنامج الثالث	Master of Architectural Engineering (MC-ARCHENG)	University of Melbourne	School of Design	Faculty of Architecture	Australia	Engineers Australia	M.Sc. Architecture Engineering	-------	Courses

University of Sana'a
Faculty of Engineering
Department: Architectural Engineering
Title of the Program: Master of Science in Architectural Engineering

Program Specification

#	The Academic Program اسم البرنامج المماثل	The University الجامعة	The Faculty الكليّة	The Department القسم	The Country الدولة	Program Accrediting Body جهة اعتماد البرنامج	Degree Award at Program Completion الدرجةالتي يمنحها البرنامج للخريج	Year of accreditation سنة الحصول على الاعتماد	Type of program
The 4th Program البرنامج الرابع	Master of Science in Architecture (M Sc)	The American University in Cairo	School of Sciences and Engineering	Department of Architecture	Egypt	-	M.Sc. Architecture	--------	Courses + Thesis
The 5th Program البرنامج الخامس	M.Sc. Architecture Engineering	Libyan Academy for Postgraduate Studies	School of Engineering Sciences	Department of Civil and Architectural Engineering	Libya	-	M.Sc. Architecture Engineering	-------	Courses + Thesis
The 6th Program البرنامج السادس	M.Sc. Architecture Engineering	An-Najah National University	Faculty of Graduate Studies	-	Palestine	-	M.Sc. Architecture Engineering	-------	Courses + Thesis

Program Specification

ملحق (3) مسح مخرجات التعلم في البرامج المماثلة لبرنامج ماجستير الهندسة المعمارية

Annex-3, Survey of Intended Learning Outcomes for Similar Accredited for Master of Science in architectural Engineering Program at International Universities

ProgramIntendedOutcomes	Suggested PILOs for the Current Program: MSc Architectural Engineering Program at Sana'a University		1st Program: United Arab Emirates University	2nd Program: The University of Jordan	3rd Program: University of Melbourne	4th Program: The American University in Cairo	5th Program: Libyan Academy for Postgraduate Studies	6th Program: An-Najah National University
A. Knowledge and Understanding	**Upon successful completion of the Master of Science in architectural Engineering Program, graduates should be able to:**							
	A1.	Demonstrate in understanding of knowledge of applied mathematics and engineering science to the field of architectural engineering.						
	A2.	Discuss concepts, principles, techniques and theories in the areas of building architecture, urban planning and design, contemporary architecture in the Islamic context and environmental design.	√	√	√			
	A3.	Knowledge of current practice contexts, including environmental, technological,	√	√				

Program Specification

ProgramIntendedOutcomes	Suggested PILOs for the Current Program: MSc Architectural Engineering Program at Sana'a University		1st Program: United Arab Emirates University	2nd Program: The University of Jordan	3rd Program: University of Melbourne	4th Program: The American University in Cairo	5th Program: Libyan Academy for Postgraduate Studies	6th Program: An-Najah National University
		regulatory and project-delivery systems.						
	A4.	Demonstrate critical thinking towards architectural current paradigms towards making an impact in the future of the architectural domain.		√	√	√		
B. Cognitive/ Intellectual Skills	**Upon successful completion of the Master of Science in architectural Engineering program, graduates should be able to:**							
	B1.	Evaluate engineering systems in high performance built environment according to relevant regulations and codes.	√					
	B2.	Evaluate and develop the cognitive and creative skills in design concept that demonstrates the exercise of theoretical reflection, critical choice, imagination and professional responsibility, through the exploration, testing and refinement of			√	√		

Program Specification

ProgramIntendedOutcomes	Suggested PILOs for the Current Program: MSc Architectural Engineering Program at Sana'a University		1st Program United Arab Emirates University	2nd Program The University of Jordan	3rd Program University of Melbourne	4th Program The American University in Cairo	5th Program Libyan Academy for Postgraduate Studies	6th Program An-Najah National University
		different technical and aesthetic alternatives.						
	B3.	Employing the skills of higher thinking, critical and creative thinking, and practicing scientific thinking and logical analysis in investigating, diagnosing and addressing the issues and problems of architecture engineering, urban planning and design.	√	√	√	√		
C. Practical and Professional Skills	**Upon successful completion of the Master of Science in architectural Engineering program, graduates should be able to:**							
	C1.	Apply advanced research methods to the analysis and solution of engineering problems.	√	√	√			
	C2.	Develop comprehensive engineering systems, highly specialized components, or appropriate processes for built	√		√			

Program Specification

ProgramIntendedOutcomes	Suggested PILOs for the Current Program: MSc Architectural Engineering Program at Sana'a University		1st Program United Arab Emirates University	2nd Program The University of Jordan	3rd Program University of Melbourne	4th Program The American University in Cairo	5th Program Libyan Academy for Postgraduate Studies	6th Program An-Najah National University
		environment.						
	C3.	Apply advanced knowledge in a specialized and emerging area in high performance built environment.	√	√				
	C4.	Use relevant techniques in the fields of environmental design, technology and sustainability in architecture engineering.	√	√	√			
D. General and Transferable Skills	**Upon successful completion of theMaster of Science in architectural Engineering program, graduates should be able to:**							
	D1.	Demonstrate ethical principles, awareness of professional and ethical responsibility as well as knowledge of the standards utilized in related fields.		√	√			
	D2.	Conduct independently and communicate research that advances and extends			√			

Program Specification

ProgramIntendedOutcomes	Suggested PILOs for the Current Program: MSc Architectural Engineering Program at Sana'a University		1st Program: United Arab Emirates University	2nd Program: The University of Jordan	3rd Program: University of Melbourne	4th Program: The American University in Cairo	5th Program: Libyan Academy for Postgraduate Studies	6th Program: An-Najah National University
		knowledge and scholarship in related fields.						
	D3.	Own intellectual independence, with initiative and creativity in new situations and/or for further learning, plan and execute original research with full responsibility and accountability for personal outputs.			√			
	D4.	Demonstrate interest in independent self-learning and continuous professional development, demonstrates commitment to acquire and generate unique knowledge and skills, and proposes new ideas and programs that contribute to the development of architecture engineering.	√	√				

Program Specification

Intended Outcomes for Similar Programs

Program 1: United Arab Emirates University - Master of Science in Architectural Engineering

Upon successful completion of this program, students will be able to:

1. Apply advanced research techniques and methods to the analysis and solution of engineering problems Demonstrate advanced knowledge sufficient to analyze complex environmental issues related to building and urban systems.
2. Develop comprehensive engineering systems, highly specialized components, or appropriate processes for built environment.
3. Apply advanced knowledge in a specialized and emerging area in high performance built environment.
4. Develop communication skills to present, explain and criticize highly complex issues.
5. Evaluate engineering systems in high performance built environment according to relevant regulations and codes.
6. Evaluate knowledge of contemporary professional practice in high performance built environment.

Program 2: The University of Jordan - Master of Architectural Engineering

Upon completion of the Architecture Engineering program, the student is expected to be able to:

7. 1. Discuss and analyze concepts, principles, techniques and theories in the areas of building architecture, urban planning and design, contemporary architecture in the Islamic context and environmental design.
8. 2. Employing the skills of higher thinking, critical and creative thinking, and practicing scientific thinking and logical analysis in investigating, diagnosing and addressing the issues and problems of architecture engineering, urban planning and design.
9. 3. Use relevant techniques in the fields of environmental design, technology and sustainability in architecture engineering.
10. 4. Demonstrate interest in independent self-learning and continuous professional development, demonstrates commitment to acquire and generate unique knowledge and skills, and proposes new ideas and programs that contribute to the development of architecture engineering.
11. 5. Accomplish accuracy in achievement and works effectively within the team and prepares and presents presentations on important and modern topics in the fields of architecture engineering.
12. 6. Bear the responsibility and exercise his rights and duties within the value system of the society and deal with the national institutions and the local community.
13. 7. Employ the research methodologies and the tools derived from them and methods of data collection, analysis and interpretation in the preparation of his letter and the preparation of different types of research related to architecture engineering and prepare reports in the light of their results.

14. 8. Assess changes that have occurred in the field of architecture engineering and analyze the various factors that are controlled locally, regionally and globally, explore and diagnose the network of international relationships and interactions affecting them and provide scenarios for their future potential developments.

Program 3: University of Melbourne -Master of Architectural Engineering

Knowledge:

1. Advanced knowledge of the principles of engineering underpinning the provision of infrastructure.
2. Advanced knowledge of design based on architectural history, theory and contemporary practice.
3. Knowledge of current practice contexts, including environmental, technological, regulatory and project-delivery systems.
4. A knowledge of research and design-research methodologies and methods, including empirical and advanced research methods drawn from the sciences and humanities relevant to the disciplines of architecture and civil engineering.

Skills

1. The cognitive and creative skills to develop and evaluate a design concept that demonstrates the exercise of theoretical reflection, critical choice, imagination and professional responsibility, through the exploration, testing and refinement of different technical and aesthetic alternatives.
2. Technical and communication skills to design, evaluate, implement, analyse, theorise about developments that contribute to professional practice or scholarship in the fields of engineering and architecture
3. The technical and creative skills to produce output that demonstrates an appreciation of economic factors, environmental issues, social and cultural issues, building systems and materials.
4. The technical research skills to justify and interpret theoretical propositions, methodologies, conclusions, professional and business decisions to specialist and non-specialist audiences
5. The skills to generate design and contractual documentation that clearly conveys information to both specialist and non-specialist audiences and that enables a project to be realised.
6. Development of skills in research principles and methods relevant to engineering and architecture
7. Cognitive, technical and creative skills to investigate, analyse and synthesise complex information, problems, concepts and theories and to apply established theories to different bodies of knowledge or practice related to architecture and engineering

Application of knowledge and skills:

1. Demonstrate application of knowledge and skills in the fields of engineering and architecture, and an ability to operate effectively across the disciplines.
2. Use of cross-discipline knowledge to solve problems that span interdisciplinary space in professional practice
3. The ability to think strategically at different environmental and urban scales
4. The ability to establish and evaluate requirements and priorities in new project situations and contexts
5. The ability to work individually and collaboratively to prepare and deliver a project
6. The ability to prepare, structure, schedule, evaluate and deliver a substantial research or design research project.
7. Cognitive skills to demonstrate mastery of theoretical knowledge and to reflect critically on theory and professional practice of engineering and architectwre.

Generic skills

1. An ability to evaluate and synthesise research and professional literature
2. Advanced skills and techniques applicable to the areas of engineering and architecture
3. Well-developed problem-solving abilities, characterised by flexibility of approach
4. Advanced competencies in professional expertise and scholarship
5. A capacity to articulate their knowledge and understanding in oral and written presentations
6. An advanced understanding of the international context and sensitivities of professional practice in architecture and engineering
7. An appreciation of the design, conduct and reporting of original research
8. A capacity to manage competing demands on time, including self-directed project work
9. A profound respect for truth and·intellectual integrity, and for the ethics of scholarship
10. An appreciation of the ways in which advanced knowledge equips the student to offer leadership
11. The capacity to value and participate in projects which require team-work and problem-based collaborative learning
12. An understanding of the significance and value of their knowledge to the wider community
13. A capacity to engage where appropriate with issues in contemporary society, and
14. Advanced working skills in the application of computer systems and software and a receptiveness to the opportunities offered by new technologies

Program 4: The American University in Cairo - Master of Science in Architecture (M Sc) degree

Graduates of the Master of Science in Architecture will be able to:
1. Demonstrate sufficient academic and applied skills in architecture for employment within the architectural international and local firms and/or pursue a PhD degree in Architecture.
2. Demonstrate critical thinking towards architectural current paradigms towards making an impact in the future of the architectural domain.
3. Demonstrate awareness of the issues inherent in the multidisciplinary nature of the built environment and address them in a comprehensive and inclusive way.
4. Demonstrate awareness of the issues inherent in the rich culture and heritage of Egypt and the Middle East with a critical eye to relevant contexts
5. Work individually or within multidisciplinary teams and provide leadership to integrate different specialized groups.

Program 5Libyan Academy for Postgraduate Studies- M.Sc. Architecture EngineeringAnd Urban Planning

- none

Program 6 An-Najah National University- M.Sc. Architecture Engineering

- none

Program Specification

ملحق (4) مسح ملخص البرامج المماثلة لبرنامج ماجستير الهندسة المعمارية

Annex-4 Summary of Similar Programs (Benchmarks) for Master of Science in Architectural Engineering Program

1.Summary of Similar Programs (Benchmarks) for Architecture Engineering Program

	The Similar Programs (Benchmarks)						Current program
	The 1st Program	The 2nd Program	The 3rd Program	The 4th Program	The 5th Program	The 6th Program	
The Program Tittle	Master of Science in Architectural Engineering	M.Sc. Architecture Engineering	Master of Architectural Engineering (MC-ARCHENG)	Master of Science in Architecture (M Sc)	M.Sc. Architecture Engineering	M.Sc. Architecture Engineering	**M.Sc. Architecture Engineering**
The Faculty	College of Engineering	School of Engineering	School of Design	School of Sciences and Engineering	School of Engineering Sciences	Faculty Of Graduate Studies	**Faculty of Engineering**
The University	United Arab Emirates University	The University of Jordan	University of Melbourne	The American University in Cairo	Libyan Academy for Postgraduate Studies	An-Najah National University	**Sana'a University**
The Country	UAE	Jordan	Australia	Egypt	Libya	Palestine	**Yemen**

University of Sana'a
Faculty of Engineering
Department: Architectural Engineering
Title of the Program: Master of Science in Architectural Engineering

Program Specification

1.Summary of Similar Programs (Benchmarks) for Architecture Engineering Program							
	The Similar Programs (Benchmarks)						Current program
	The 1st Program	The 2nd Program	The 3rd Program	The 4th Program	The 5th Program	The 6th Program	
Type of program	Courses + Thesis	Courses + Thesis	Courses	Courses + Thesis	Courses + Thesis	Courses + Thesis	**Courses + Thesis**
Study methods in the program:	Full and part-time regular	Full time regular	Full and part-time regular	Full time regular	Full time regular	Full time regular	**Full Time**
Number of semesters	Full time 12-24 months	**4**	**6**	**4**	**4**	**4**	**Maximum =6 Minimum =4**
Total Credit Hours (without Thesis)	**21 credit hours**	**33**	**350 credit points**	**33**	**34**	**30**	**36**
No. of Courses for compulsory courses (with Faculty requirement)	**4**	**6**	**8**	**5**	**6**	**6**	**5**
Credit Hours for compulsory courses	**12 credit hours**	**18**	**100 points**	**15**	**18**	**18**	**15**

Program Specification

1.Summary of Similar Programs (Benchmarks) for Architecture Engineering Program							
	The Similar Programs (Benchmarks)						Current program
	The 1st Program	The 2nd Program	The 3rd Program	The 4th Program	The 5th Program	The 6th Program	
No. of Courses for Electives courses	3	2	250 points	3	6	4	5
Credit Hours for Electives courses	9	6	-	9	16	12	15
Complementary courses to join the program and their number	--	--	--	--	--	--	--
Credit Hours for Thesis	9	9	-	9	6	6	6
Total Credit Hours for courses & Thesis	30 credit hours	33	350 credit points	33	40	36	36
The period for thesis completion	-	-	-	-	-	-	Min.=2 semesters Max.=4 semesters

Program Specification

1.Summary of Similar Programs (Benchmarks) for Architecture Engineering Program							
	The Similar Programs (Benchmarks)						Current program
	The 1st Program	The 2nd Program	The 3rd Program	The 4th Program	The 5th Program	The 6th Program	
The min. period to complete the program	-	2 years	3-years	N/A	2 years	2 years	4 semesters
The max. period to complete the program	-	-	6 years	-	3 years	-	6 semesters

Program Specification

ملحق (5) مسح أسماء المقررات الدراسية في البرامج المماثلة لبرنامج ماجستير الهندسة المعمارية
Annex-5, Survey of Course Names of Similar Program

University		United Arab Emirates University	The University of Jordan	University of Melbourne	The American University in Cairo	Libyan Academy for Postgraduate Studies	An-Najah National University	Sana'a University
Faculty		College of Engineering	School of Engineering	School of Design	School of Sciences and Engineering	School of Engineering Sciences	Faculty Of Graduate Studies	Faculty of Engineering
Program		Master of Science in Architectural Engineering	M.Sc. Architecture Engineering	Master of Architectural Engineering (MC-ARCHENG)	Master of Science in Architecture (M Sc)	M.Sc. Architecture Engineering	M.Sc. Architecture Engineering	Master in Architecture Engineering
Country		UAE	Jordan	Australia	Egypt	Libya	Palestine	Yemen
No. of Courses		7	8	24	8	12	10	10
Total Cr. Hrs.		21	33	350 credit points	33	40	36	30 without thesis 36 with thesis
Total Years		-	-	3	-			Maximum =3 years Minimum =2 years
Term	**No**	**Course Name**	**Course Name**	**Course Name**	**Course Name**	**Course Name**	**Course Name**	**Course Name**
1	1	Research Methods	Architecture Research methodology		Research Methods in Architecture	Research methods		Scientific Research Methodology

Program Specification

University		United Arab Emirates University	The University of Jordan	University of Melbourne	The American University in Cairo	Libyan Academy for Postgraduate Studies	An-Najah National University	Sana'a University
	2		Architecture theories		philosophy & Theory of Architecture		Design Theory and Methodology	Arch. Design Theories
	3		Methods of urban planning			Urban Planning		Urban Planning
	4					Housing Development and Sustainable	Housing Issues & Policies	Housing
	5	Sustainable Urbanism	Architecture and sustainable development	Building Sustainability				Sustainability in architecture and urban planning
	6						Vernacular Architecture	vernacular architecture
	7	Climate Research in Build Energy Efficiency	Environmental design			Building environment		Environmental Design
	8		Contemporary Architecture and Technology			Building technology and	Building Systems & Technology	Architecture Technology

Program Specification

University		United Arab Emirates University	The University of Jordan	University of Melbourne	The American University in Cairo	Libyan Academy for Postgraduate Studies	An-Najah National University	Sana'a University
						Structural Systems		
2	1		Architectural criticism and analysis				Architecture Criticism	Aesthetics and Architectural Criticism
	2		Urban design and planning			Urban Design	Urban Design	Urban Design
	3						Urban & Rural Sociology	Urban Sociology
	4						Islamic Town Planning	Islamic city planning
	5							21th Century city planning
	6						Sustainable Architecture	Sustainability in architecture and urban planning
	7		Preserving the architectural heritage				Architectural Conservation Urban Conservation	Architectural and urban Conservation

Program Specification

University		United Arab Emirates University	The University of Jordan	University of Melbourne	The American University in Cairo	Libyan Academy for Postgraduate Studies	An-Najah National University	Sana'a University
	8		Contemporary architecture in the Islamic context				Contemporary Architecture in the Islamic World	Contemporary Islamic Architecture
	9							Project Management
	10							Advanced Statistics
	11							Sustainability in architecture and urban planning
	12						Urban Regeneration	Architectural and urban Conservation
	3							
	4							
	5							
	3							
	4							
	5							
Total CH								

Program Specification

ملحق (6) مسح الرؤية والرسالة والاهداف البرامج المعتمدة المماثلة لبرنامج الهندسة المعمارية

Annex (6) Survey/ Mapping of Vision, Mission and Objectives of Similar Accredited Programs at International Universities(Benchmarks) for Master of architectural engineering program

	The 1st Program	The 2nd Program	The 3rd Program	The 4th Program	The 5th Program	The 6th Program
Country	**UAE**	**Jordan**	**Australia**	**Egypt**	**Libya**	**Palestine**
University	United Arab Emirates University	The University of Jordan	University of Melbourne	The American University in Cairo	Libyan Academy for Postgraduate Studies	An-Najah National University
Faculty	College of Engineering	School of Engineering	School of Design	School of Sciences and Engineering	School of Engineering Sciences	Faculty Of Graduate Studies
Department/ Program	Architectural Engineering Department /Master of Science in Architectural Engineering	M.Sc. Architecture Engineering	Master of Architectural Engineering (MC-ARCHENG)	Master of Science in Architecture (M Sc)	M.Sc. Architecture Engineering	M.Sc. Architecture Engineering
Study Duration	-	-	3years	-	2-3 years	24 month
Program Accrediting Body	ABET	-	Engineers Australia	-	-	-
Website Link	https://eng.uaeu.ac.ae//en/programs/graduate/master-of-science-in-architectural-engineering.shtml	http://engineering.ju.edu.jo/Lists/OurPrograms/School_Postgraduate.aspx	https://study.unimelb.edu.au/find/courses/graduate/master-of-architectural-engineering/	https://www.aucegypt.edu/academics/graduate-studies	https://www.academy.edu.ly/en	https://www.najah.edu/en/academic/postgraduate-programs/program/architectural-engineering/info-card/

Program Specification

Department Vision	non	non	non	non	To be one of the leading departments in the field of research and studies, preparing scientific and educational cadres, and establishing an advanced and distinguished scientific center in the fields of civil and architectural engineering of interest to the country of Libya in particular and the world in general.	non
Department Mission	Architectural Engineering at the United Arab Emirates University seeks to provide the highest quality of graduate and undergraduate education through innovative and interactive broad-based educational experience, enabling students to address complex and multi-faceted architectural engineering problems			- The mission of the Department of Architecture is to train future architects who can lead the architectural profession into the digital age, with an understanding of context as means of respecting local heritage, by maintaining a	Preparing distinguished cadres in the field of civil and architectural engineering and pioneering in conducting research and studies, transferring knowledge and localizing technology, in order to serve and develop society.	

Program Specification

	and to advance in the profession to respond to changing technological and societal needs			balance between digital design, professional content, and contextual, humanistic and sustainable approaches		
Department Objectives	Prepare students to be effective participants in professional work teams responsible for shaping and improving the built environment of UAE cities without compromising heritage culture and values. Be a student-centered department with world-class curricula and a national and regional hub for academic excellence in architectural education & research. Expose students to strong science and engineering foundation for the diverse applications of	non		The aim is to equip future architects with a comprehensive vision integrating various aspects of the built environment: how it is planned, designed, used and appreciated by society; and to prepare students for starting a successful professional and academic career as Architects by granting them an internationally recognized Professional Degree validated	1. Preparing qualified engineers in subspecialties who are able to practice the profession with high efficiency according to the latest findings of science and using advanced technologies in the fields of analysis, design, implementation and supervision of engineering projects. 2. Preparing scientific and educational cadres to teach in engineering institutes and colleges	non

	architectural engineering in the built environment and have the capacity to work comfortable with data analysis, interpretation, experimentation, design and construction. Develop students' professional aptitude for gaining the necessary self-learning lifelong learning skills, teamwork, critical enquiry, reasoning, communicating in public. Expand students' capability to formulate their own opinions on contemporary professional issues and enable them to debate their opinions constructively in public. Graduate innovative engineers who are problems solvers at both architectural component design and the holistic building			by the International Union of Architects	and to carry out scientific research and studies. 3. Establishing and developing the base of scientific research among the students of the department and preparing specialists in the field of civil and architectural engineering through in-depth specialized studies and serious research in order to reach innovative scientific and applied additions and uncover new facts. 4. Encouraging scientific competencies to keep pace with the rapid progress of science and technology and pushing them to	

Program Specification

	levels with passion to use resources efficiently. Graduate engineering who can work and practice architectural engineering effectively using state of the art information technology methods, techniques, and tools. Graduate engineering who value professional ethics and conduct and recognize the importance of professional integrity and their socio-cultural and environmental responsibilities and obligations to society. Graduate competent and highly skilled engineers capable for participating effectively in the urbanization and development of the built environment of the UAE. Collaborate effectively with the society				creativity and innovation 5. Developing scientific research, encouraging and organizing it, and communicating with industrial and productive institutions using research results and technology applications, providing scientific and engineering consultations and technical services to public and private institutions in the country, and developing scientific trends to address community issues. 6. Adopting scientific conferences and seminars that could contribute to developing methods	

Program Specification

	through research and service				and approaches adopted in all areas of life. 7. Providing opportunities for higher and specialized education in the field of civil and architectural engineering to pursue their higher studies locally.	
Program Mission	non	non		non	non	non
Program Objectives	- Develop meaningful research on interactions between buildings and the surrounding environment at the local, national, and regional levels. - Provide research and professional training			1. Enable students to learn how to bridge between architecture and other disciplines in order to develop a responsive built environment.		

Program Specification

	necessary for graduates to advance and move into higher professional or academic functions. - Maintain high international academic standards in research and professional students' learning outcomes. - Promote the collaboration between the Architectural Engineering research and graduate studies and the government and industrial sectors nationally and internationally.			2. Enable students to explore the nature and substance of other field(s) to identify overlaps and value to address architectural issues. 3. Develop an understanding of the interplay of economic, social, psychological and tectonic aspects in shaping the built environment. 4. Develop an understanding of the past, present and future paradigms of Architecture. 5. Reflect on		

Program Specification

				"What's Next", pose relevant questions, and explore different directions, paths, or modes of thinking and frames of mind derived from a clear contextual understanding. 6. Develop competence in the formulation of, conduct and pursue of comprehensive research questions integrating other related disciplines.		

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Program Specification

ملحق (7) مؤائمة رسالة وأهداف البرنامج مع رؤية ورسالة واهداف الكلية والجامعة

Annex (7) Mapping of mission and objective of the program with vision, mission and objectives of faculty, and university

Mapping of program vision with Department, faculty, and university vision			
University Vision	**Faculty Vision**	**Department vision**	**Program vision**
Sana'a University aspires to achieve a national leading role in teaching, learning, scientific research and community service; and to be among the best regional universities and the foremost house of expertise and think tank in Yemen.	To excel in engineering education & scientific research with distinction at the local and regional levels.	To be distinguished post-graduate program education & scientific research in architectural engineering, locally and regionally.	To be distinguished post-graduate program education & scientific research in architectural engineering, locally and regionally.

Mapping of program mission with Department, faculty and university mission			
University Mission	Faculty Mission	Department Mission	Program Mission
To contribute to the sustainable development efforts by providing an accredited higher education environment and excellent research services within a fruitful national partnership based on transparency, professionalism and creativity.	To provide excellent and accredited engineering education to meet the development needs and match the labor market requirements locally and regionally.	To promote the architectural engineering education by adopting specialized and scientific Curricula and rich Yemeni architectural heritage and scientific research.	To graduate well qualified post-graduate students in the field of architectural engineering and research through qualified academic program, staff, and suitable infrastructure that meet the development requirements as well as local and regional labor markets.

Program Specification

Mapping of program objectives with Department, faculty, and university objectives			
University Objectives	**Faculty Objectives**	**Department Objectives**	**Program Objectives**
1. To provide specialized and in-depth academic opportunities for students in different fields of knowledge to meet the country's needs of specialties, technicians and experts, with special focus on the following:	1. To offer study programs in various fields of knowledge and equip students with required knowledge and scientific and know-how skills to utilize them in resolving problems effectively and efficiently.	1. To enable graduates to use their imagination, creative thinking, innovation and leadership in architectural work	**1.** To provide specialized studies and encourage fundamental and applied research in different architectural engineering disciplines.
2. To boost the level and quality of preparation and qualification tasks.	2. To develop positive trends towards engineering science and its accelerating developments and enable students to use the techniques and methods of conducting scientific research in engineering fields.	2. To provide graduates with knowledge and advanced techniques in architectural design and urban planning	**2.** To bridge the gap between the academic educational and industrial and technological environment.
3. To create a general culture aiming at developing the elements of sound Islamic personality and the proper cognitive and scientific training.	3. To develop skills of scientific, innovative and critical thinking as well as the concept of continuous self-education.	3. To enable graduates to collect data, identify problems, apply analyses, and draft work strategies	**3.** To provide graduates with up-to-date advanced knowledge and skills needed to create high-quality systems, attain the excellence in architectural engineering and solve architectural design and urbanplanning problems.

Program Specification

Mapping of program objectives with Department, faculty, and university objectives			
University Objectives	**Faculty Objectives**	**Department Objectives**	**Program Objectives**
4. To stabilize the true Islamic vision emanating from the broad horizons of Islamic knowledge and its perception of the universe, man and life.	4. To strengthen scientific ties with national and international colleges, scientific bodies, and research & development centers.	4. To provide graduates with practical efficiency related to communication skills and profession ethics	4. To contribute effectively to the architectural engineering profession by applying ethical practices and communication skills, sharing innovative and clear ideas and pursuing further education through lifelong learning
5. To develop innovative and critical scientific thinking skills.	5. To provide technical and specialized studies and consultations to various state bodies and institutions, both public and semi-public, and utilize them in resolving the environment and society issues to promote sustainable development.	5. To graduate architects who are able to follow up the requirements of profession changes; using professional capacity, technological skills, and personal views; respecting profession ethics, including cooperation and communication; providing community with services; leading and directing the community	5. To graduate researchers in architectural engineering disciplines who can pursue further studies and contribute to the scientific research community.
6. To provide students with the required knowledge and scientific and applied skills for solving problems effectively and efficiently.	6. To develop a spirit of co-operation, group work, effective leadership, sense of responsibility, and ethical commitment.		

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ملحق (8) المساقات الرئيسية واوزانها الفرعية لبرنامج ماجستير الهندسة المعمارية

Appendix (8) Main Themes/Sub-Themes with Relative weight for architectural engineering Program.

No.	Themes	Credit Hours	Courses Number	Relative weight for Theme	Sub-Themes
0	NA				-
1					-
2					-
3					-
4					-
5					-
6					-
7					-
	Total			**100%**	

* This total is the overall total of both Compulsory and Elective courses.

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ملحق (9) توزيع مخرجات التعلم لبرنامج ماجستير الهندسة المعمارية مع المساقات الرئيسية

Appendix (9)P- ILOs Distribution to Main Themes for Master of Science in architectural engineering program

No	PILOs	Themes							
		1st Theme	2nd Theme	3rd Theme	4th Theme	5th Theme	6th Theme	7th Theme	8th Theme
1	A1	NA							
2	A2								
3	A3								
4	A4								
5	B1								
6	B2								
7	B3								
8	C1								
9	C2								
10	C3								
11	D1								
12	D2								
13	D3								
14	D4								

Program Specification

ملحق (10) موائمة مخرجات تعلم برنامج ماجستير الهندسة المعمارية مع المقررات

Appendix (10) Mapping Program Intended Learning Outcomes with courses for Master of Science in architectural engineering program

Course Name	Program Intended Learning Outcomes (P-IOLs)															
	(A)				(B)				(c)				(D)			
	A1	A2	A3	A4	B1	B2	B3		C1	C2	C3	C4	D1	D2	D3	D4
Scientific Research Methodology		x	x						x				x			
Arch. Design Theories		x		x		x	x						x			
Urban Planning	x	x	x	x		x	x		x	x	x		x	x	x	x
Housing	x	x	x	x	x	x	x		x	x	x		x	x	x	x
Sustainability in architecture and urban planning		x	x		x	x	x		x	x	x		x	x	x	x
vernacular architecture		x	x	x		x	x						x	x	x	x
Environmental Design	x	x	x			x	x		x	x	x		x	x	x	x
Architecture Technology		x	x		x	x	x		x	x	x		x	x	x	x
Aesthetics and Architectural Criticism			x	x		x	x						x	x	x	x
Urban Design		x	x	x		x	x		x	x	x		x	x	x	x
Urban Sociology		x		x		x	x									

Program Specification

Course Name	Program Intended Learning Outcomes (P-IOLs)															
	(A)				(B)				(c)				(D)			
	A1	A2	A3	A4	B1	B2	B3		C1	C2	C3	C4	D1	D2	D3	D4
Islamic city planning		x	x			x	x		x	x	x	x	x	x	x	x
21th Century city planning		x	x	x	x	x	x		x	x	x		x	x	x	x
Architectural and urban Conservation		x	x	x	x	x	x		x	x	x		x	x	x	x
Contemporary Islamic Architecture		x	x	x	x	x	x		x	x	x		x	x	x	x
Project Management	x	x											x	x	x	x
Advanced Statistics	x	x														
THESIS																

Program Intended Learning Outcomes (PILOs) Upon successful completion of the Master in architectural Engineering Program, graduates should be able to:	
A. Knowledge and Understanding	
A1.	Demonstrate in understanding of knowledge of applied mathematics and engineering science to the field of architectural engineering.
A2.	Discuss concepts, principles, techniques and theories in the areas of building architecture, urban planning and design, contemporary architecture in the Islamic context and environmental design.
A3.	Knowledge of current practice contexts, including environmental, technological, regulatory and project-delivery systems.

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Program Intended Learning Outcomes (PILOs) Upon successful completion of the Master in architectural Engineering Program, graduates should be able to:	
A4.	Demonstrate critical thinking towards architectural current paradigms towards making an impact in the future of the architectural domain.
B. Intellectual Skills	
B1.	Evaluate engineering systems in high performance built environment according to relevant regulations and codes.
B2.	Evaluate and develop the cognitive and creative skills in design concept that demonstrates the exercise of theoretical reflection, critical choice, imagination and professional responsibility, through the exploration, testing and refinement of different technical and aesthetic alternatives.
B3.	Employing the skills of higher thinking, critical and creative thinking, and practicing scientific thinking and logical analysis in investigating, diagnosing and addressing the issues and problems of architecture engineering, urban planning and design.
C. Practical and Professional Skills	
C1.	Apply advanced research methods to the analysis and solution of engineering problems.
C2.	Develop comprehensive engineering systems, highly specialized components, or appropriate processes for built environment.
C3.	Apply advanced knowledge in a specialized and emerging area in high performance built environment.
C4.	Use relevant techniques in the fields of environmental design, technology and sustainability in architecture engineering.
D. Key Transferrable Skills	
D1.	Demonstrate ethical principles, awareness of professional and ethical responsibility as well as knowledge of the standards utilized in related fields.
D2.	Conduct independently and communicate research that advances and extends knowledge and scholarship in related fields.
D3.	Own intellectual independence, with initiative and creativity in new situations and/or for further learning, plan and execute original research with full responsibility and accountability for personal outputs.
D4.	Demonstrate interest in independent self-learning and continuous professional development, demonstrates commitment to acquire and generate unique knowledge and skills, and proposes new ideas and programs that contribute to the development of architecture engineering.

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ملحق (11) موائمة مخرجات تعلم برنامج ماجستير الهندسة المعمارية مع المرجعيات

Appendix (11) Mapping Program Intended Learning Outcomes with the benchmarks for Master In architectural engineering program

Standards and Benchmarks	(IOLs)Intended Learning Outcomes															
	(A)				(B)				(c)				(D)			
	A1	A2	A3	A4	B1	B2	B3		C1	C2	C3		D1	D2	D3	D4
N/A																

Program Intended Learning Outcomes (PILOs) Upon successful completion of the Master in architectural Engineering Program, graduates should be able to:	
A. Knowledge and Understanding	
A1.	Demonstrate in understanding of knowledge of applied mathematics and engineering science to the field of architectural engineering.
A2.	Discuss concepts, principles, techniques and theories in the areas of building architecture, urban planning and design, contemporary architecture in the Islamic context and environmental design.
A3.	Knowledge of current practice contexts, including environmental, technological, regulatory and project-delivery systems.
A4.	Demonstrate critical thinking towards architectural current paradigms towards making an impact in the future of the architectural domain.

Program Specification

Program Intended Learning Outcomes (PILOs) Upon successful completion of the Master in architectural Engineering Program, graduates should be able to:	
B. Intellectual Skills	
B1.	Evaluate engineering systems in high performance built environment according to relevant regulations and codes.
B2.	Evaluate and develop the cognitive and creative skills in design concept that demonstrates the exercise of theoretical reflection, critical choice, imagination and professional responsibility, through the exploration, testing and refinement of different technical and aesthetic alternatives.
B3.	Employing the skills of higher thinking, critical and creative thinking, and practicing scientific thinking and logical analysis in investigating, diagnosing and addressing the issues and problems of architecture engineering, urban planning and design.
C. Practical and Professional Skills	
C1.	Apply advanced research methods to the analysis and solution of engineering problems.
C2.	Develop comprehensive engineering systems, highly specialized components, or appropriate processes for built environment.
C3.	Apply advanced knowledge in a specialized and emerging area in high performance built environment.
C4.	Use relevant techniques in the fields of environmental design, technology and sustainability in architecture engineering.
D. Key Transferrable Skills	
D1.	Demonstrate ethical principles, awareness of professional and ethical responsibility as well as knowledge of the standards utilized in related fields.
D2.	Conduct independently and communicate research that advances and extends knowledge and scholarship in related fields.
D3.	Own intellectual independence, with initiative and creativity in new situations and/or for further learning, plan and execute original research with full responsibility and accountability for personal outputs.
D4.	Demonstrate interest in independent self-learning and continuous professional development, demonstrates commitment to acquire and generate unique knowledge and skills, and proposes new ideas and programs that contribute to the development of architecture engineering.

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ملحق (12) مواءمة أهداف البرنامج مع مخرجات التعلم المقصودة لبرنامج ماجستير الهندسة المعمارية
Annex-12, Alignment of Engineering Program Objectives with Program Intended Learning Outcomes

Program Objectives رقم ونص المعيار	Program Intended Learning Outcomes (PILOs) رموز مخرجات التعلم للبرنامج PILOs													
	A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**C1**	**C2**	**C3**	**D1**	**D2**	**D3**	**D4**
Upon successful completion of the MSc Architectural Engineering program, graduates should be able to:														
1. To provide specialized studies and encourage fundamental and applied research in different architectural engineering disciplines.	√	√	√	√	√	√	√	√	√	√	√	√	√	√
2. To bridge the gap between the academic educational and industrial and technological environment.		√			√	√	√	√	√	√	√	√	√	
3. To provide graduates with up-to-date advanced knowledge and skills needed to create high-quality systems, attain the excellence in architectural engineering and solve the technical and design problems and challenges in architecture.		√	√		√	√	√	√	√	√	√	√		√

Program Specification

Program Objectives رقم ونص المعيار	Program Intended Learning Outcomes (PILOs) رموز مخرجات التعلم للبرنامج PILOs													
	A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**C1**	**C2**	**C3**	**D1**	**D2**	**D3**	**D4**
4. To contribute effectively to the architectural engineering profession by applying ethical practices and communication skills, sharing innovative and clear ideas and pursuing further education through lifelong learning			√		√	√	√	√	√	√	√	√	√	√
5. To graduate researchers in architectural engineering disciplines who can pursue further studies and contribute to the scientific research community.		√		√	√	√	√	√	√	√	√		√	√

University of Sana'a
Faculty of Engineering
Department: Architectural Engineering
Title of the Program: Master of Science in Architectural Engineering

Program Specification

Program Intended Learning Outcomes (PILOs) Upon successful completion of the Master of Science in Architectural Engineering Program, graduates should be able to:	
A. Knowledge and Understanding	
A1.	Demonstrate in understanding of knowledge of applied mathematics and engineering science to the field of architectural engineering.
A2.	Discuss concepts, principles, techniques and theories in the areas of building architecture, urban planning and design, contemporary architecture in the Islamic context and environmental design.
A3.	Knowledge of current practice contexts, including environmental, technological, regulatory and project-delivery systems.
A4.	Demonstrate critical thinking towards architectural current paradigms towards making an impact in the future of the architectural domain.
B. Intellectual Skills	
B1.	Evaluate engineering systems in high performance built environment according to relevant regulations and codes.
B2.	Evaluate and develop the cognitive and creative skills in design concept that demonstrates the exercise of theoretical reflection, critical choice, imagination and professional responsibility, through the exploration, testing and refinement of different technical and aesthetic alternatives.
B3.	Employing the skills of higher thinking, critical and creative thinking, and practicing scientific thinking and logical analysis in investigating, diagnosing and addressing the issues and problems of architecture engineering, urban planning and design.
C. Practical and Professional Skills	
C1.	Apply advanced research methods to the analysis and solution of engineering problems.
C2.	Develop comprehensive engineering systems, highly specialized components, or appropriate processes for built environment.
C3.	Apply advanced knowledge in a specialized and emerging area in high performance built environment.
C4.	Use relevant techniques in the fields of environmental design, technology and sustainability in architecture engineering.

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Program Intended Learning Outcomes (PILOs) Upon successful completion of the Master of Science in Architectural Engineering Program, graduates should be able to:	
D. Key Transferrable Skills	
D1.	Demonstrate ethical principles, awareness of professional and ethical responsibility as well as knowledge of the standards utilized in related fields.
D2.	Conduct independently and communicate research that advances and extends knowledge and scholarship in related fields.
D3.	Own intellectual independence, with initiative and creativity in new situations and/or for further learning, plan and execute original research with full responsibility and accountability for personal outputs.
D4.	Demonstrate interest in independent self-learning and continuous professional development, demonstrates commitment to acquire and generate unique knowledge and skills, and proposes new ideas and programs that contribute to the development of architecture engineering.