

International Academy for Engineering and Media Science

Engineering Division

Architectural Engineering Department

Program Specification

For

Architectural Engineering Program

Bylaw 2012

Program Specification

International Academy for Engineering and Media Science

Engineering Division

Architectural Engineering Programme.

A. Basic information

- 1- Program Title** : Architectural Engineering
- 2- Program type** : single
- 3- Department** : Architectural Engineering
- 4- Program Coordinator** : Dr. Mohamed Abdraboh Amirah
- 5- External Evaluators** : 1 – Dr. Mai Wahbah Mohamed
(Asst. Professor of Architecture, Faculty of Engineering, Tanta University)
In Oct. 2023
: 2 - Dr. Wael Youssef
(Professor of Architecture & Urban Design, Faculty of Engineering, Al-Azhar University)
In Sep. 2020
- 6- Internal Evaluators** : 1 - Dr. Muhammad Ghonim
(Professor of Architecture& Design, Faculty of Engineering, Cairo University)
In Jul. 2023
: 2 - Dr. Shaima Magdy
(Professor of Urban Planning & Design, Faculty of Engineering, Fayoum University)
In Dec. 2022
- 7- Date of program Bylaw approval** : Ministerial decision No. 4266 dated
17/9/2012
- 8- Date of program specification approval:** 10/2020

B. Professional information

1. Architectural Engineering Program Mission:

In the framework of the mission of the Engineering Division of the International Academy of Engineering and Media Sciences, the Architectural Engineering Program is committed to preparing graduates who are capable of innovation and development in the field of architecture to meet the needs of the local and regional labor market and keep abreast of technological, environmental and applied technologies in accordance with national academic reference standards in order to meet the goals of sustainable development in light of professional values.

2. Architectural Engineering Program Objectives: -

The Architectural Engineering program aims to equip its graduates with a diverse range of knowledge and skills in architecture. The graduate should be able to:

- O1-** Provide students with theoretical and applied knowledge and skills related to architecture that align with the needs of society and the labor market, ensuring continuous self-learning and meeting sustainability requirements.
- O2-** Graduate competent architects with the scientific understanding and knowledge necessary for the architectural field. This includes supporting their ability to adhere to professional ethics, traditions, and rules of honest competition.
- O3-** Expand students' horizons, fostering creative and innovative abilities in all areas related to architecture.
- O4-** Support students in applying the scientific method to think critically, conduct research, and solve problems. This prepares them to produce architecturally and urbanistically efficient projects using advanced technologies and modern sciences.

- O5-** Provide students with practical experiences in design and execution by training them on realistic projects with various constraints, enhancing their capabilities for effective participation in work teams.
- O6-** Apply knowledge of engineering concepts, basic science, and analytical, critical, and systematic thinking to identify and solve engineering problems.
- O7-** Demonstrate professional and ethical responsibilities while applying engineering standards and sustainability principles to design, model, and develop digital systems.
- O8-** Contribute to the development of the profession and community by showcasing leadership qualities, business administration skills, and entrepreneurial capabilities.

3. Graduate Attributes of the Architectural Engineering Program:

The Architectural Engineering program is committed to preparing graduates to be able to:

- G1-** Designing creative, artistic and cultural architectural projects.
- G2-** Proficient in communication and presentation skills, with attention to detail and wholeness, and understanding the details of visuals and environmental data.
- G3-** Using advanced technologies and programs to produce implementation documents with the ability to learn and self-develop.
- G4-** Supervising and implementing architectural elements, solving problems using analytical and creative methods, and working within a team.
- G5-** Applying ethical, professional and humanitarian standards, union and governmental laws and regulations and their importance in practicing the profession of architecture.
- G6-** Realizing the importance of sustainability, environmental preservation, identity, style and human personality in architecture.

4. Relationship of program objectives with graduate attributes

Table 1 shows the relationship between the program objectives and graduate attributes.

(Table 1), The Matrix of the relationship between Program objectives and graduate attributes.

| Program Objectives | Graduate Attributes | | | | | |
|--------------------|---------------------|----|----|----|----|----|
| | G1 | G2 | G3 | G4 | G5 | G6 |
| O1 | * | | | * | | |
| O2 | | | | | * | * |
| O3 | | * | | | * | |
| O4 | | | * | | | |
| O5 | | | * | | * | |
| O6 | * | | * | | * | * |
| O7 | * | | | | | * |
| O8 | | | | * | | * |

5. The Academic Reference for the Program: -

In the Framework of the National Academic Reference Standards for the Engineering Sector 2018 (NARS 2018), the program competencies are classified into two levels:

- **Level A:** This level reflects the general competencies that any graduate from the College of Engineering should have gained.
- **Level B:** This level reflects the general specialized competencies that any graduate in the field of architecture engineering should possess.

Competencies for Engineering Graduates (Level A)

The Engineering Graduate must be able to:-

- A1.** Identify formulate, and solve complex engineering problems by applying

engineering fundamentals, basic science and mathematics.

- A2.** Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
- A3.** Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
- A4.** Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
- A5.** Practice research techniques and methods of investigation as an inherent part of learning.
- A6.** Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.
- A7.** Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams.
- A8.** Communicate effectively - graphically, verbally and in writing - with a range of audiences using contemporary tools.
- A9.** Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
- A10.** Acquire and apply new knowledge; and practice self: lifelong and other learning strategies.

Competencies for Architectural Engineering Graduates (Level B)

In addition to the Competencies for All Engineering Programs the basic Architectural Engineering graduate and similar programs must be

able to: -

- B1.** Create architectural, urban and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of: history and theory, related fine arts, local culture and heritage, technologies and human sciences.
- B2.** Produce designs that meet building users' requirements through understanding the relationship between people and buildings, and between buildings and their environment; and the need to relate buildings and the spaces between them to human needs and scale,
- B3.** Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology and engineering problems associated with building designs.
- B4.** Transform design concepts into buildings and integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations and procedures involved.
- B5.** Prepare design project briefs and documents, and understand the context of the architect in the construction industry, including the architect's role in the processes of building, procurement of architectural services and building production.

6. The Academic Reference and Program Aims: -

Table 2 explains how the competencies of the current program achieve the program aims:

(Table 2), The Matrix of the relation between Program Aims and Academic Reference

| | | Academic Reference (NARS 2018) | | | | | | | | | | | | | | |
|--------------------|----|--------------------------------|----|----|----|----|----|----|----|----|-----|----|----|----|----|----|
| | | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | B1 | B2 | B3 | B4 | B5 |
| Program Objectives | O1 | * | * | * | | | | | | | * | * | * | * | | |
| | O2 | | | * | * | | | | | | | | * | * | | |
| | O3 | | | | | | | * | | * | | | | | * | |
| | O4 | | | | * | * | | | | | | | | | | * |
| | O5 | | | | | * | | | | * | * | | | | | * |
| | O6 | * | * | * | | | | | | | | * | * | * | | |
| | O7 | | | * | | | | | * | | | * | * | * | * | |
| | O8 | | | | | | * | | | | | | | * | * | * |

7. Program Intended Learning Outcomes (ILOs)

I. Knowledge, Understanding and Awareness: -

KU1 - Define a variety of concepts, principles, and theories of engineering, architecture and related disciplines.

KU2 - Describe the attributes of architectural products and the influences that affect their design and implementation, within historical, contemporary, local, and global contexts.

KU3 - Explain how architectural and urban products are studied, researched, designed and produced, in relation to the adopted tools, techniques, processes and methods.

- KU4** - Discuss a variety of topics, problems and issues related to architecture, including functional, aesthetic, social, cultural, environmental, technical, and economic aspects.
- KU5** - Recognize the architects' roles in designing, implementing, appraising and developing architectural and urban products.
- KU6** – Express the values and ethics of architects towards the society, environment and profession.
- KU7** - Argue the implications of globalization, innovation, climate change, energy saving, and digitalization on architecture and urbanism.

II. Intellectual and Cognitive Skills: -

- ICS1** - Use the fundamentals of mathematics, physics, science, and engineering, in solving of specific architectural and engineering problems.
- ICS2** - Apply knowledge, principles, and standards of functional requirements in different situations of architectural and engineering practice.
- ICS3** - Utilize design specifications, codes, and regulations to create buildings and designs that are comfortable, accessible, healthy, safe, and risk-free.
- ICS4** - Select in response to their performance expectations the appropriate structural and non-structural systems, as well as, construction and finishing materials.
- ICS5** - Appraise the principles of fine arts and aesthetics as an influence on the quality of architectural design.
- ICS6** - Employ the community social needs in designing the architectural and urban products.
- ICS7** - Adopt the principles and standards of sustainable and environmental design to produce buildings that are eco-friendly.
- ICS8** - Operate effectively a range of computer software to complete several tasks related to the architectural practice.

ICS9 - Propose the proper methods and processes when designing urban and architectural projects and preparing the necessary drawings and documents.

ICS10 - Integrate research-based decisions in various design processes.

ICS11 - Implement logical reasoning to compare, defend, criticize, and evaluate architectural products and solutions.

ICS12 - Report a group of professional activities related to design and construction works to document projects phases and responsibilities.

III. Practical and Professional Skills: -

PPS1 - Produce two-dimensional and three-dimensional drawings and models, using manual and digital tools.

PPS2 - Conduct scientific research and investigations using a range of sources, tools, and methods, to identify, understand, and solve architectural problems.

PPS3 - Formulate effective reports and presentations for various tasks, ideas and projects.

PPS4 - Prepare construction drawings, specifications, and documents for architectural products.

PPS5 - Develop briefs, programs, and plans for managing the design and construction processes in architecture.

PPS6 - Generate ideas keeping in mind users' needs, building's usage and environmental impact.

PPS7 - Propose architectural responses that incorporate principles of anthropometry, health, safety, and welfare.

PPS8 - Create ideas and solutions to architectural problems that consider aesthetic, functional, social, cultural, environmental, technical, and economical aspects.

PPS9 - Design several types of architectural products, systems, buildings and projects.

IV. General and Transferable Skills: -

GTS1 - Manage effectively tasks, time, and resources, with respect of priorities.

GTS2 - Demonstrate fluently the verbal, visual and written communication skills required for the profession.

GTS3 - Act in stressful situations to carry workloads, achieve goals and meet deadlines.

GTS4 - Find information and knowledge to keep engaged in self-directed learning and life-long education.

GTS5 - Demonstrate listening and discussion skills with respect to different opinions and investment of feedback.

GTS6 - Work collaboratively in teams as a member or a leader in multi-disciplinary and multi-cultural situations.

8. Program Structure: -

Program Duration : 5 years.

Program Credit : 165 Hrs.

Compulsory Courses : 139 Hrs.

Elective Courses : 26 Hrs.

(Table 3), Courses Classification

| Course Contents | | | | | | | |
|-----------------|--------|-------|---------|-------|---------|---------|-------|
| Norms % | A | B | C | D | E | F | G |
| | 8-12 % | 2-4 % | 18-22 % | 4-6 % | 25-30 % | 25-30 % | 4-6 % |
| Hours | 18 | 6 | 33 | 9 | 49 | 42 | 8 |

| Course Contents | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|---------|
| Norms % | A | B | C | D | E | F | G |
| | 8-12 % | 2-4 % | 18-22 % | 4-6 % | 25-30 % | 25-30 % | 4-6 % |
| Actual | 10.9 % | 3.6 % | 20 % | 5.5 % | 29.7 % | 25.5 % | 4.8 % |
| Matching | Matched | Matched | Matched | Matched | Matched | Matched | Matched |

Humanities and Social Science, University Requirements.

Business Administration

Mathematics and Basic sciences

Engineering Culture.

Basic Engineering Sciences

Engineering and design applications

Project and field training

Firstly: General Culture Requirement

A total of 23 credit hours (13 Hrs. compulsory + 10 Hrs. elective), representing 14% of the total grade requirement and covers humanities, social sciences, and general culture courses that are meant to build student personality and capabilities, including the following course:

a) General Culture Requirement (Compulsory)

(Table 4), General culture, social sciences, and humanities course (13 compulsory credit hours)

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|--------------------|-----|-----|----|-----|----------|--------------------|---------|
| HUM 011 | Arabic language | 2 | 2 | | | | اللغة العربية | أنس 011 |
| HUM 012 | English language 1 | 2 | 1 | 2 | | | اللغة الإنجليزية 1 | أنس 012 |
| HUM 013 | English language 2 | 2 | 1 | 2 | | HUM 012 | اللغة الإنجليزية 2 | أنس 013 |
| HUM 352 | Human wrights | 1 | 1 | | | | حقوق الإنسان | أنس 352 |

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|-------------------------------------|-----|-----|----|-----|----------|-----------------------|---------|
| HUM 081 | Computer skills | 0 | 1 | | 4 | | مهارات الحاسب الآلي | أنس 081 |
| HUM 181 | Communication & Presentation Skills | 2 | 1 | 2 | | | مهارات الاتصال والعرض | أنس 181 |
| HUM 182 | Analysis & Research Skills | 2 | 1 | 2 | | | مهارات البحث والتحليل | أنس 182 |
| HUM 381 | Principles of Negotiation | 2 | 2 | | | | مبادئ التفاوض | أنس 381 |

b) General Culture Requirement (Elective A)

(Table 5), General culture, social sciences, and humanities course (8 credit hours-elective A)

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|--|-----|-----|----|-----|----------|----------------------------|---------|
| HUM x62 | Music Appreciation | 2 | 2 | | | | التذوق الموسيقي | أنس x62 |
| HUM x71 | Introduction to the History of Civilizations | 2 | 2 | | | | مقدمة في تاريخ الحضارات | أنس x71 |
| HUM x72 | Trend in Contemporary Arts | 2 | 2 | | | | الاتجاهات الفنية المعاصرة | أنس x72 |
| HUM x73 | Recent Egypt's History | 2 | 2 | | | | تاريخ مصر الحديث | أنس x73 |
| HUM x74 | Heritage of Egyptian Literature | 2 | 2 | | | | التراث الأدبي المصري | أنس x74 |
| HUM x75 | Arabic & Islamic Civilization | 2 | 2 | | | | الحضارة العربية والإسلامية | أنس x75 |
| HUM x76 | Literary Appreciation | 2 | 2 | | | | التذوق الأدبي | أنس x76 |

c) General Culture Requirement (Elective B)

(Table 6), General culture, social sciences, and humanities course (2 credit hours-elective B)

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|--------|----------------------------|-----|-----|----|-----|----------|-------------------|---------|
| HUM121 | Introduction to Accounting | 2 | 2 | | | | مقدمة في المحاسبة | أنس 121 |

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|--------|-------------------------|-----|-----|----|-----|----------|-------------|---------|
| HUM221 | Business Administration | 2 | 2 | | | | إدارة أعمال | أنس 221 |

Secondly: Institute Requirement

It covers the minimum required level of engineering courses that all engineering graduates must study, the following table these courses comprising a total of 45 credit hours (39 Hrs. compulsory + 6 Hrs. elective)

a) Compulsory Requirement (39 Credit Hours)

(Table 7), Institute Requirement Courses (39 credit hours)

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|-------------------------------------|-----|-----|----|-----|----------|----------------------------|---------|
| 291 | Field Training 1 | 1 | | | | | تدريب ميداني 1 | 291 |
| 391 | Field Training 2 | 1 | | | | | تدريب ميداني 2 | 391 |
| BAS 011 | Mathematics 1 | 3 | 2 | 2 | | | رياضيات 1 | أسس 011 |
| BAS 012 | Mathematics 2 | 3 | 2 | 2 | | BAS 011 | رياضيات 2 | أسس 012 |
| BAS 212 | Statistics & Probability Theory | 3 | 2 | 2 | | | إحصاء ونظرية احتمالات | أسس 212 |
| BAS 021 | Physics 1 | 3 | 2 | 1 | 2 | | فيزياء 1 | أسس 021 |
| BAS 022 | Physics 2 | 3 | 2 | 1 | 2 | BAS 021 | فيزياء 2 | أسس 022 |
| BAS 031 | Mechanics | 4 | 3 | 2 | | | ميكانيكا | أسس 031 |
| BAS 041 | Engineering Chemistry | 3 | 2 | 1 | 2 | | كيمياء هندسية | أسس 041 |
| CIW 331 | Environmental Impact of Projects | 1 | 1 | | | | الأثر البيئي للمشروعات | مدش 331 |
| MED 011 | Engineering Drawings & Projection | 3 | 1 | 3 | 3 | | الرسم الهندسي والإسقاط | مكص 011 |
| MED 021 | History of Engineering & Technology | 1 | 1 | | | | تاريخ الهندسة والتكنولوجيا | مكص 021 |

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|---|-----|-----|----|-----|----------|--------------------------|---------|
| MED 022 | Principles of Manufacturing Engineering | 2 | 2 | 1 | 1 | | مبادئ هندسة التصنيع | مكص 022 |
| IEN 314 | Project Management | 2 | 2 | 1 | | | إدارة المشروعات | صنع 314 |
| IEN 131 | Monitoring & Quality Control Systems | 1 | 1 | | | | نظم المراقبة وضبط الجودة | صنع 131 |
| IEN 351 | Engineering Economics | 2 | 2 | 1 | | | اقتصاد هندسي | صنع 351 |
| HUM 111 | Technical Report Writing | 2 | 1 | 2 | | | إعداد التقارير الفنية | إنس 111 |
| HUM 351 | Professional Ethics | 1 | 1 | | | | أخلاقيات المهنة | أنس 351 |

b) Institute Elective Courses (6 Elective Credit Hours)

(Table 8), Institute Requirement Courses (6 Elective Credit Hours)

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|---|-----|-----|----|-----|----------|------------------------------|---------|
| CIS 111 | Principles of Construction & Building Engineering | 2 | 2 | 1 | | | مبادئ هندسة التشييد والبناء | مدن 111 |
| ARC 111 | Arts & Architecture | 2 | 2 | 1 | | | الفنون والعمارة | عمر 111 |
| ELP 111 | Principles of Electrical Engineering | 2 | 2 | 1 | | | مبادئ الهندسة الكهربائية | هتك 111 |
| ELE 121 | Principles of Electronic Engineering | 2 | 2 | 1 | | | مبادئ الهندسة الإلكترونية | هكت 111 |
| MED 111 | Principles of Design & Manufacturing Engineering | 2 | 2 | 1 | | | مبادئ هندسة التصميم والتصنيع | مكص 111 |

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|--|-----|-----|----|-----|----------|-------------------------------|--------|
| MEP 111 | Principles of Mechanical Power Engineering | 2 | 2 | 1 | | | مبادئ هندسة القوى الميكانيكية | مق 111 |

Thirdly: Major Requirements (Compulsory)

a) Compulsory Requirement (87 Credit Hours)

(Table 9), Major Compulsory Courses (87 Credit Hours)

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|-------------------------------------|-----|-----|----|-----|----------|-----------------------------|---------|
| CIS 112 | Structure Analysis 1 | 3 | 2 | 2 | | | تحليل إنشائي 1 | مدن 112 |
| CIS 222 | Reinforced Concrete & Foundations | 3 | 2 | 2 | | | خرسانة مسلحة وأساسات | مدن 222 |
| CIS 231 | Design of Steel Structures 1 | 3 | 2 | 2 | | | تصميم المنشآت المعدنية 1 | هكق 111 |
| CIS 141 | Behaviour of Materials | 3 | 2 | 1 | 2 | | خواص المواد | هكت 111 |
| CIW 121 | Engineering Surveying | 3 | 2 | 1 | 1 | | المساحة الهندسية | مدش 121 |
| CIW 232 | Sanitary installations in Buildings | 2 | 2 | 1 | | | التركيبات الصحية في المباني | مدش 232 |
| ARC 112 | Visual Training & Freehand Drawing | 3 | 1 | 4 | | | تدريب بصري ورسم حر | عمر 112 |
| ARC 113 | Sciagraphy & Perspective | 3 | 1 | 4 | | | ظل ومنظور | عمر 113 |
| ARC 121 | History & Theory of Architecture 1 | 2 | 2 | | | | تاريخ ونظريات عمارة 1 | عمر 121 |
| ARC 122 | History & Theory of Architecture 2 | 2 | 2 | | | | تاريخ ونظريات عمارة 2 | عمر 122 |
| ARC 223 | History & Theory of Architecture 3 | 2 | 2 | | | | تاريخ ونظريات عمارة 3 | عمر 223 |

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|------------------------------------|-----|-----|----|-----|----------|------------------------------|---------|
| ARC 224 | History & Theory of Architecture 4 | 2 | 2 | | | | تاريخ ونظريات عمارة 4 | عمر 224 |
| ARC 131 | Building Construction 1 | 3 | 1 | 4 | | | إنشاء معماري 1 | عمر 131 |
| ARC 132 | Building Construction 2 | 3 | 1 | 4 | | | إنشاء معماري 2 | عمر 132 |
| ARC 233 | Building Construction 3 | 3 | 1 | 4 | | | إنشاء معماري 3 | عمر 233 |
| ARC 331 | Working Drawings 1 | 3 | | 6 | | | تصميمات تنفيذية 1 | عمر 331 |
| ARC 332 | Working Drawings 2 | 3 | | 6 | | | تصميمات تنفيذية 2 | عمر 332 |
| ARC 241 | Environmental Control | 3 | 2 | 2 | | | تحكم بيئي | عمر 241 |
| ARC 242 | Acoustics & Illumination | 3 | 2 | 2 | | | صوتيات وإضاءة | عمر 242 |
| ARC 151 | Architectural Design 1 | 3 | | 6 | | | تصميم معماري 1 | عمر 151 |
| ARC 252 | Architectural Design 2 | 3 | | 6 | | | تصميم معماري 2 | عمر 252 |
| ARC 253 | Architectural Design 3 | 3 | | 6 | | | تصميم معماري 3 | عمر 253 |
| ARC 354 | Architectural Design 4 | 3 | | 6 | | | تصميم معماري 4 | عمر 354 |
| ARC 355 | Architectural Design 5 | 3 | | 6 | | | تصميم معماري 5 | عمر 355 |
| ARC 261 | Landscape & Urban Design | 3 | 1 | 4 | | | تنسيق مواقع وتصميم عمراني | عمر 261 |
| ARC 262 | History & Theory of Planning | 2 | 2 | | | | تاريخ ونظريات التخطيط | عمر 262 |
| ARC 463 | Housing | 3 | 2 | 2 | | | إسكان | عمر 463 |
| ARC 371 | Architectural & Urban Legislations | 2 | 2 | | | | تشريعات معمارية وعمرانية | عمر 371 |
| ARC 472 | Execution Documents | 3 | 2 | 2 | | | مستندات التنفيذ | عمر 472 |
| ARC 491 | Project 1 | 1 | | 2 | | | مشروع 1 | عمر 491 |
| ARC 492 | Project 2 | 5 | | 10 | | | مشروع 2 | عمر 492 |
| MEP 342 | Air Conditioning in Buildings | 2 | 2 | 1 | | | تكييف هواء في المباني | مكق 342 |

b) Elective Requirement – Group A (4 Credit Hours)

(Table 10), Major Elective Courses – Group A (4 Credit Hours)

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|--|-----|-----|----|-----|----------|-----------------------------------|---------|
| ARC 327 | Architectural Criticism & Project Evaluation | 2 | 2 | | | | نقد معماري وتقييم مشاريع | عمر 327 |
| ARC 334 | Building Economics | 2 | 2 | | | | اقتصاديات البناء | عمر 334 |
| ARC 335 | Advanced Technical Installations | 2 | 2 | | | | تركيبات فنية متقدمة في المباني | عمر 335 |
| ARC 336 | Maintenance of Buildings | 2 | 2 | | | | تأهيل وصيانة المباني | عمر 336 |
| ARC 372 | Feasibility Studies of Urban Projects | 2 | 2 | | | | دراسات الجدوى المشروعات العمرانية | عمر 372 |

c) Elective Requirement – Group B (6 Credit Hours)

(Table 11), Major Elective Courses – Group B (6 Credit Hours)

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|--------------------------------|-----|-----|----|-----|----------|----------------------------|---------|
| ARC 411 | Computer Applications in Arch | 3 | 1 | 2 | 3 | | تطبيقات الحاسب في العمارة | عمر 411 |
| ARC 457 | Interior Design | 3 | 1 | 4 | | | تصميم داخلي | عمر 457 |
| ARC 458 | Sustainable Architecture | 3 | 1 | 4 | | | العمارة المستدامة | عمر 458 |
| ARC 464 | Urban Renewal | 3 | 1 | 4 | | | تجديد وارتقاء عمراني | عمر 464 |
| ARC 481 | Conservation of Urban Heritage | 3 | 1 | 4 | | | الحفاظ على التراث العمراني | عمر 481 |

9. Suggested Study Plan for Architectural Engineering Program

Preparatory Level

المستوى الإعدادي

First Semester

(جدول 12)، الفصل الدراسي الأول

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|---|-----|-----|----|-----|----------|------------------------|---------|
| BAS 011 | Mathematics 1 | 3 | 2 | 2 | | | رياضيات 1 | أسس 011 |
| BAS 021 | Physics 1 | 3 | 2 | 1 | 2 | | فيزياء 1 | أسس 021 |
| BAS 041 | Engineering Chemistry | 3 | 2 | 1 | 2 | | كيمياء هندسية | اسس 041 |
| MED 011 | Engineering Drawing & Projection | 3 | 1 | 3 | 3 | | الرسم الهندسي والإسقاط | مكص 011 |
| MED 022 | Principles of Manufacturing Engineering | 2 | 2 | 1 | 1 | | مبادئ هندسة التصنيع | مكص 022 |
| HUM 012 | English Language 1 | 2 | 1 | 2 | | | اللغة الإنجليزية 1 | إنس 012 |
| HUM 352 | Human Rights | 1 | 1 | | | | حقوق الإنسان | إنس 352 |
| | | 17 | 11 | 10 | 8 | | | |
| | | | | 29 | | | | |

Second Semester

(جدول 13)، الفصل الدراسي الثاني

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|-------------------------------------|-----|-----|----|-----|----------|----------------------------|---------|
| -A1 | Institute Elective A | 2 | 2 | 1 | | | اختياري معهد أ | -A1 |
| BAS 012 | Mathematics 2 | 3 | 2 | 2 | | | رياضيات 2 | أسس 012 |
| BAS 022 | Physics 2 | 3 | 2 | 1 | 2 | | فيزياء 2 | اسس 022 |
| BAS 031 | Mechanics | 4 | 3 | 2 | | | ميكانيكا | اسس 031 |
| MED 021 | History of Engineering & Technology | 1 | 1 | | | | تاريخ الهندسة والتكنولوجيا | مكص 021 |
| HUM 011 | Arabic Language | 2 | 2 | | | | اللغة العربية | إنس 011 |
| HUM 013 | English Language 2 | 2 | 1 | 2 | | | اللغة الإنجليزية 2 | إنس 013 |
| HUM 081 | Computer Skills | | 1 | | 4 | | مهارات الحاسب الآلي | إنس 081 |
| | | 17 | 14 | 8 | 6 | | | |
| | | | | 28 | | | | |

First Level

المستوى الأول

First Semester

(جدول 14)، الفصل الدراسي الأول

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|--------|------------------------------------|-----------|-----------|-----------|-----|----------|-----------------------|---------|
| -A2 | Institute Elective A | 2 | 2 | 1 | | | اختياري معهد أ | -A2 |
| -A3 | Institute Elective A | 2 | 2 | 1 | | | اختياري معهد أ | -A3 |
| CIS112 | Structural Analysis1 | 3 | 2 | 2 | | | تحليل انشائي 1 | مدن 112 |
| Arc112 | Visual Training & Freehand Drawing | 3 | 1 | 4 | | | تدريب بصري ورسم حر | عمر 112 |
| Arc113 | Sciagraphy & Perspective | 3 | 1 | 4 | | | ظل ومنظور | عمر 113 |
| Arc121 | History & Theory of Architecture 1 | 2 | 2 | | | | تاريخ ونظريات عمارة 1 | عمر 121 |
| ARC131 | Building Construction 1 | 3 | 1 | 4 | | | انشاء معماري 1 | عمر 131 |
| | | 18 | 11 | 16 | | | | |
| | | | | 27 | | | | |

Second Semester

(جدول 15)، الفصل الدراسي الثاني

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|------------------------------------|-----|-----|----|-----|----------|-----------------------|---------|
| CIS 141 | Behavior of Materials | 3 | 2 | 1 | 2 | | خواص مواد | مدن 141 |
| CIW 121 | Engineering Surveying | 3 | 2 | 1 | 1 | | المساحة الهندسية | مدش 121 |
| ARC 122 | History & Theory of Architecture 2 | 2 | 2 | | | | تاريخ ونظريات عمارة 2 | عمر 122 |
| ARC 132 | Building Construction 2 | 3 | 1 | 4 | | | إنشاء معماري 2 | عمر 132 |

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|--------------------------------------|-----|-----|----|-----|----------|--------------------------|---------|
| ARC 151 | Architectural Design 1 | 3 | | 6 | | | تصميم معماري 1 | عمر 151 |
| IEN 131 | Monitoring & Quality Control Systems | 1 | 1 | | | | نظم المراقبة وضبط الجودة | صنع 131 |
| HUM 182 | Analysis & Research Skills | 2 | 1 | 2 | | | مهارات البحث والتحليل | إنس 182 |
| | | 17 | 9 | 14 | 3 | | | |
| | | | | 26 | | | | |

Second Level

المستوى الثاني

First Semester

(جدول 16)، الفصل الدراسي الأول

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|------------------------------------|-----|-----|----|-----|----------|---------------------------|---------|
| CIS222 | Reinforced Concrete & Foundation | 3 | 2 | 2 | | | خرسانة مسلحة وأساسيات | مدن 222 |
| ARC223 | History & Theory of Architecture 3 | 2 | 2 | | | | تاريخ ونظريات عمارة 3 | عمر 223 |
| ARC233 | Building Construction 3 | 3 | 1 | 4 | | | انشاء معماري 3 | عمر 233 |
| Arc 252 | Architecture Design 2 | 3 | | 6 | | | تصميم معماري 2 | عمر 252 |
| ARC261 | Landscape & Urban Design | 3 | 1 | 4 | | | تنسيق مواقع وتصميم عمراني | عمر 261 |
| HUM111 | Technical Report Writing | 2 | 1 | 2 | | | إعداد تقارير فنية | إنس 111 |

| Code | Course Tittle | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|--------|-------------------------------------|-----|-----|----|-----|----------|-----------------------|---------|
| HUM181 | Communication & Presentation Skills | 2 | 1 | 2 | | | مهارات الإتصال والعرض | إنس 181 |
| | | 18 | 11 | 16 | | | | |
| | | | | 27 | | | | |

Second Semester

(جدول 17)، الفصل الدراسي الثاني

| Code | Course Tittle | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|-------------------------------------|-----|-----|----|-----|----------|-----------------------------|---------|
| 291 | Field Training 1 | 1 | | | 6 | | تدريب ميداني 1 | 291 |
| CIS 231 | Design of Steel Structures 1 | 3 | 2 | 2 | | | تصميم المنشآت المعدنية 1 | مدن 231 |
| CIW 232 | Sanitary Installations in Buildings | 2 | 2 | 1 | | | التركيبات الصحية في المباني | مدش 232 |
| ARC 224 | History & Theory of Architecture 4 | 2 | 2 | | | | تاريخ ونظريات عمارة 4 | عمر 224 |
| ARC 241 | Environmental Control | 3 | 2 | 2 | | | تحكم بيئي | عمر 241 |
| ARC 242 | Acoustics & Illumination | 2 | 1 | 2 | | | صوتيات وإضاءة | عمر 242 |
| ARC 253 | Architectural Design 3 | 3 | | 6 | | | تصميم معماري 3 | عمر 253 |
| ARC 262 | History & Theory of Planning | 2 | 2 | | | | تاريخ ونظريات تخطيط | عمر 262 |
| | | 18 | 11 | 13 | 6 | | | |
| | | | | 30 | | | | |

Third Level

المستوى الثالث

First Semester

(جدول 18)، الفصل الدراسي الأول

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|--------------------------------------|-----|-----|----|-----|----------|--------------------------------|---------|
| BAS212 | Statistics & Probability Theory | 3 | 2 | 2 | | | إحصاء ونظريات إحتمالات | أسس 212 |
| CIW331 | Environmental Impact of Projects | 1 | 1 | | | | الأثر البيئي للمشروعات | مدش 331 |
| ARC 331 | Working Drawings 1 | 3 | | 6 | | | تصميمات تنفيذية 1 | عمر 331 |
| Arc354 | Architecture Design 4 | 3 | | 6 | | | تصميم معماري 4 | عمر 354 |
| Arc -A1 | Architectural Engineering Elective A | 2 | 2 | | | | الهندسة المعمارية اختياري أ | عمر -A1 |
| MEP342 | Air Conditioning in Buildings | 2 | 2 | 1 | | | تكييف هواء في المباني | مكق 342 |
| IEN351 | Engineering Economics | 2 | 2 | 1 | | | اقتصاد هندسي | صنع 351 |
| | | 16 | 9 | 16 | | | | |
| | | | | 25 | | | | |

Second Semester

(جدول 19)، الفصل الدراسي الثاني

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|--------------------------------------|-----|-----|----|-----|----------|--------------------------------|---------|
| 391 | Field Training 2 | 1 | | | 6 | | تدريب ميداني 2 | 391 |
| ARC 332 | Working Drawings 2 | 3 | | 6 | | | تصميمات تنفيذية 2 | عمر 332 |
| Arc355 | Architecture Design 5 | 3 | | 6 | | | تصميم معماري 5 | عمر 355 |
| ARC 371 | Architectural & Urban Legislations | 2 | 2 | | | | تشريعات معمارية وعمرانية | عمر 371 |
| Arc -A2 | Architectural Engineering Elective A | 2 | 2 | | | | الهندسة المعمارية اختياري أ | عمر -A2 |
| IEN 314 | Project Management | 2 | 2 | 1 | | | إدارة مشروعات | صنع 314 |
| HUM 351 | Professional Ethics | 1 | 1 | | | | اخلاقيات مهنة | إنس 351 |
| HUM 381 | Principles Of Negotiation | 2 | 2 | | | | مبادئ التفاوض | إنس 381 |
| | | 16 | 9 | 13 | 6 | | | |
| | | | | 28 | | | | |

Fourth Level

المستوى الرابع

First Semester

(جدول 20)، الفصل الدراسي الأول

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|--|-----|-----|----|-----|----------|--------------------------------|---------|
| ARC463 | Housing | 3 | 2 | 2 | | | اسكان | عمر 463 |
| ARC 491 | Project 1 | 1 | | 2 | | | مشروع 1 | عمر 491 |
| Arc -B1 | Architectural Engineering Elective B | 3 | 1 | 4 | | | الهندسة المعمارية اختياري ب | عمر -B1 |
| Arc -B2 | Architectural Engineering Elective B | 3 | 1 | 4 | | | الهندسة المعمارية اختياري ب | عمر -B2 |
| HUM -A1 | General Elective A | 2 | 2 | | | | ثقافة عامة – اختياري أ | إنس -A1 |
| HUM -A2 | General Elective A | 2 | 2 | | | | ثقافة عامة – اختياري أ | إنس -A2 |
| | | 14 | 8 | 12 | | | | |
| | | | | 20 | | | | |

Second Semester

(جدول 21)، الفصل الدراسي الثاني

| Code | Course Title | Cr. | Lec | Ex | Lab | Pre-req. | اسم المقرر | كود |
|---------|------------------------|-----|-----|----|-----|----------|------------------------|---------|
| ARC 472 | Execution Documents | 3 | 2 | 2 | | | مستندات التنفيذ | عمر 472 |
| ARC 492 | Project 2 | 5 | | 10 | | | مشروع 2 | عمر 492 |
| HUM -A3 | General Elective A | 2 | 2 | | | | ثقافة عامة – اختياري أ | إنس -A3 |
| HUM -A4 | General Elective A | 2 | 2 | | | | ثقافة عامة – اختياري أ | إنس -A4 |
| HUM -B1 | General Elective B | 2 | 2 | | | | ثقافة عامة – اختياري ب | إنس -B1 |
| | | 14 | 8 | 12 | | | | |
| | | | | 20 | | | | |

10. Program Admission Requirements:

Having Egyptian Secondary education or equivalent certificate with major in Mathematics, then after passing the preparatory year and fulfilling the admission requirements the students will be able to attend the department.

11. Regulations for progression and program completion:

- The student will be in the preparatory level when he joined the academy. Then, he moves to the first level after the completion of the study of 36 credit hours. In this level, the student must choose the department that he wants to join. After that, he moves to the second level after the completion of the study of 72 credit hours, and moving to the third level at the completion of the study of 108 credit hours. Finally, the student moves to the fourth level.
- Courses registration policy is based on the average GPA of the student as follows:

The maximum number of hours of teaching (36) credit hours spread over two semesters, and according to the following rules: -

1. Registration of 18 credit hours for students with an average GPA of 2 or more
2. Registration of 15 credit hours for students with an average GPA of less than 2 and even 1.5
3. Registration of 12 credit hours for students with an average GPA of less than 1.5 to 1
4. Registration of 9 credit hours for students with an average GPA of less than 1
5. Registration priority will be given in the decisions of the repetition and the decisions of the lower level.

The Grades of Success:

Table 22 shows the program grades of success.

(Table 22), The Grades of Success

| Symbol | Points | Grade | Percentage |
|--------|--------|-----------|---------------------------------|
| A | 4.0 | Excellent | more than 95% |
| A- | 3.7 | | More than 90% and less than 95% |
| B+ | 3.3 | Very good | More than 85% and less than 90% |
| B | 3.0 | | More than 80% and less than 85% |
| B- | 2.7 | | More than 75% and less than 80% |
| C+ | 2.3 | Good | More than 70% and less than 75% |
| C | 2.0 | | More than 65% and less than 70% |
| C- | 1.7 | | More than 60% and less than 65% |
| D+ | 1.3 | Fair | More than 55% and less than 60% |
| D | 1.0 | | More than 50% and less than 55% |
| F | 0 | Fail | Less than 50% |

12. Teaching and Learning Methods

طرق التدريس والتعلم

Table 23 clarify the relation between program teaching & learning methods and the program competencies

(Table 23), The Matrix of the relationship between Teaching and Learning Methods and Program Competencies

| | | Teaching and Learning Methods | | | | | | | |
|-----------------------------|------------|-------------------------------|---------------------|-------------|------------|------------|--------------|---------|----------|
| | | Lecture | Tutorial / Exercise | Discussions | Laboratory | Site Visit | Presentation | Project | Research |
| Program Competencies | A1 | * | * | | | | | | |
| | A2 | | | * | * | | | * | * |
| | A3 | * | * | | | | | | |
| | A4 | * | * | | | * | | | |
| | A5 | | | | | | | | * |
| | A6 | | | * | * | * | | * | |
| | A7 | | | | | | * | | * |
| | A8 | | | * | | | * | | |
| | A9 | | | * | | | * | | * |
| | A10 | | | * | | | | | * |
| | B1 | * | * | | | | | | * |
| | B2 | * | * | | | | | * | |
| | B3 | * | * | | * | | * | | |
| | B4 | * | * | | | | | * | |
| | B5 | * | * | | | * | | | |

13. Assessment Methods:

Table 24 illustrates how the program assessment methods achieve the program competencies.

(Table 24), The Relation between Program Competencies and Assessment Methods.

| | | Assessment Methods | | | | | |
|----------------------|-----|--------------------|---------|----------|--------|---------|-------------|
| | | Exam | Quizzes | Research | Report | Project | Discussions |
| Program Competencies | A1 | * | * | * | * | | * |
| | A2 | | | * | * | | * |
| | A3 | * | * | | * | * | |
| | A4 | * | * | | * | | |
| | A5 | | | * | | | * |
| | A6 | | | * | * | * | * |
| | A7 | | | * | * | * | |
| | A8 | | | * | * | * | |
| | A9 | | | * | * | | |
| | A10 | | | | * | * | * |
| | B1 | * | * | * | * | * | * |
| | B2 | * | * | * | * | * | * |
| | B3 | * | * | * | * | * | * |
| | B4 | * | * | * | * | * | * |
| | B5 | * | * | * | * | * | * |

14. Evaluation of program learning outcomes

| No. | Evaluator | Tool | Sample |
|-----|--------------------------|----------------------|--------|
| 1 | Senior students | Meeting + questioner | 20% |
| 2 | Alumni | questioner | 20% |
| 3 | Stakeholders (Employers) | Site visits | NA |
| 4 | Evaluator | External members | NA |
| 5 | Others | - | NA |

Program Coordinator : Dr. Mohamed Abdraboh Amirah

Signature :

Date :

Division Dean : Prof. Saeid Elhalafawy

Date :

Signature :

الملاحق:

مصفوفة 1: علاقة رسالة البرنامج برسالة الشعبة:

يلتزم برنامج الهندسة المعمارية بتخريج:

PM1 مهندس معماري وفق /طبقا للمعايير القومية الأكاديمية المرجعية / القياسية والمعتمدة
.2018

PM2 استيفاء المتطلبات المهنية لسوق العمل (محلى – إقليمي – دولي).

PM3 مواكبة التقنيات التكنولوجية والبيئية والتطبيقية.

PM4 قادر على إجراء أبحاث علمية تطبيقية لخدمة المجتمع البيئية في ظل القيم المهنية.

PM5 متمكن من صياغة حلول واقعية قابلة للتطبيق لخدمة المجتمع وتنمية البيئة.

| | | رسالة البرنامج (PM) | | | | |
|------------------|-----|--|------|------|------|------|
| | | PM 1 | PM 2 | PM 3 | PM 4 | PM 5 |
| رسالة الشعبة (M) | M 1 | إعداد مهندسين متخصصين طبقاً للمعايير القومية الأكاديمية المرجعية والمعتمدة | | | | |
| | M 2 | لتلبية احتياجات سوق العمل المحلي والإقليمي | | | | |
| | M 3 | قادرين على إجراء أبحاث علمية تطبيقية | | | | |
| | M 4 | وتقديم الاستشارات الهندسية لخدمة المجتمع وتنمية البيئة في ظل قيم أخلاقية راقية | | | | |

مصفوفة 2: رسالة البرنامج بمواصفات الخريج:

| | | مواصفات الخريج (GA) | | | | | | | | | |
|---------------------|------|---------------------|------|------|------|------|------|------|------|------|-------|
| | | GA 1 | GA 2 | GA 3 | GA 4 | GA 5 | GA 6 | GA 7 | GA 8 | GA 9 | GA 10 |
| رسالة البرنامج (PM) | PM 1 | | | | | | | | | | |
| | PM 2 | | | | | | | | | | |
| | PM 3 | | | | | | | | | | |

| | | | | | | | | | | | |
|--|----|--|--|--|--|--|--|--|--|--|--|
| | PM | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| | PM | | | | | | | | | | |
| | 5 | | | | | | | | | | |

مصفوفة 3: جدارات البرنامج بمواصفات الخريج:

| جدارات البرنامج | مواصفات الخريج (GA) | | | | | | | | | |
|-----------------|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| | GA1 | GA2 | GA3 | GA4 | GA5 | GA6 | GA7 | GA8 | GA9 | GA10 |
| A1 | | | | | | | | | | |
| A2 | | | | | | | | | | |
| A3 | | | | | | | | | | |
| A4 | | | | | | | | | | |
| A5 | | | | | | | | | | |
| A6 | | | | | | | | | | |
| A7 | | | | | | | | | | |
| A8 | | | | | | | | | | |
| A9 | | | | | | | | | | |
| A10 | | | | | | | | | | |
| B1 | | | | | | | | | | |
| B2 | | | | | | | | | | |
| B3 | | | | | | | | | | |
| B4 | | | | | | | | | | |
| B5 | | | | | | | | | | |
| B6 | | | | | | | | | | |
| B7 | | | | | | | | | | |
| C1 | | | | | | | | | | |

| جدارات البرنامج | (GA) مواصفات الخريج | | | | | | | | | |
|-----------------|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| | GA1 | GA2 | GA3 | GA4 | GA5 | GA6 | GA7 | GA8 | GA9 | GA10 |
| C2 | | | | | | | | | | |
| C3 | | | | | | | | | | |
| C4a | | | | | | | | | | |
| C4b | | | | | | | | | | |
| C4c | | | | | | | | | | |
| C5a | | | | | | | | | | |
| C5b | | | | | | | | | | |
| C5c | | | | | | | | | | |
| C5d | | | | | | | | | | |
| C6a | | | | | | | | | | |
| C6b | | | | | | | | | | |

مصفوفة 4: جدارات البرنامج بمقررات البرنامج: