Future University in Egypt

Faculty of Engineering and Technology

ARCHITECTURAL ENGINEERING

PROGRAM SPECIFICATIONS
2021 Bylaw
2023-2024

Faculty of Engineering and Technology
Department of Architectural Engineering

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Program Specifications

B.Sc. in Architectural Engineering 2023-2024

A-Basic Information

1. **Program title:** B. SC. in Architectural Engineering
2. **Program type:** Single ■ Double ☐ Multiple ☐
3. **Faculty:** Faculty of Engineering & Technology
4. **Department offering the programs:**
   - Architectural Engineering
   - Interior Architectural Engineering
5. **Coordinator:** Assistant Prof. Dr. Dina Khater
6. **External evaluator(s):** Prof. Dr. Murad Abdel Kader
7. **Internal evaluator(s):** Prof. Dr. Samir Sadek Hosny
8. **Date of program bylaw approval by the Ministry of Higher Education:** January 2022
9. **Starting Date of the program:** September 2021
10. **Date of recent programme specifications approval:**
    - Department Council: 5 September 2023
    - Faculty Council: 19 September 2023

B- Professional Information

1. The Shift to Competency-based Engineering Education

The council of the Faculty of Engineering and Technology (FET) – Future University (FUE), on its session dated 30/12/2019, has adopted the National Academic Reference Standards (NARS) of Engineering, issued by the National Authority of Quality Assurance and Accreditation of Education (NAQAAE) in 2018, as the main benchmark for developing a competency-based program and course specifications for each of the study programs offered by the faculty. Accordingly, the Architectural Engineering Department has prepared a relevant gap analysis study of the shift to NARS 2018. This study was approved by the Faculty Council on its session dated 28/5/2020.

2. Architectural Engineering (AE) Program's Mission

The mission of the AE program was approved by the Architectural Engineering Department Council on its session dated **1/3/2020**, and was approved by the Faculty Council on its session dated 28/5/2020.

رســالة برنامج الهندسة المعمارية

يوفر البرنامج بيئة أكاديمية وثقافية واعدة تمكن من تأهيل مهندسين متميزين في مجال الهندسة المعمارية، قادرين علي المنافسة محليا وإقليميا، ومتوافقين مع متطلبات سوق العمل مهنيا وأخالقيا، كما تحفز هذه البيئة علي اجراء البحوث العلمية والمساهمة في خدمة المجتمع وتنمية البيئة.

Architectural Engineering Program Mission

The Architectural Engineering Program provides a promising academic environment that enables qualifying distinguished architectural engineers who can compete nationally and regionally and comply with the requirements of the job market professionally and ethically. It also motivates conducting scientific research and contributes to the community service and environment development.

Breakdown of AE Program Mission

The Architectural Engineering program provides a promising academic environment that:

PM1. enables qualifying distinguished architectural engineers who can compete nationally and regionally,

PM2. complies with the requirements of job market professionally and ethically,

PM3. motivates conducting scientific research,

PM4. contributes to community service and environment development.

3. Architectural Engineering (AE) Program aims

The main aims of the "Architectural Engineering" program at the "Faculty of Engineering and Technology" in "Future University in Egypt" are to equip graduates with the proper and fair scientific knowledge and train them to be able to:

PA1. Identify, formulate, and solve complex architectural engineering problems by applying principles of engineering, science, and mathematics.

PA2. Apply architectural engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

PA3. Communicate effectively with a range of audiences.

PA4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of architectural engineering solutions in global, economic, environmental, and societal contexts.

PA5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

PA6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PA7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

PA8. Use techniques, skills and modern engineering tools necessary for architectural engineering practice.

PA9. Demonstrate leadership qualities, business administration and entrepreneurial skills.

PA10. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community.

To achieve these aims, the program is designed to target the following **Graduate Outcomes**

4. Outcomes for AE Program's Graduate

General Program Outcomes (Level A)

PO1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.

PO2. 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.

PO3. 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.

PO4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.

PO5. Practice research techniques and methods of investigation as an inherent part of learning.

PO6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.

PO7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.

PO8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

PO9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

PO10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

Specialized Program Outcomes (Level B)

PO11. 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.

PO12. 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.

PO13. Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of structural design, construction, technology and engineering problems associated with building designs.

PC14. 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.

PC15. 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 bidding, procurement of architectural services and building production.

5. Academic Reference standards

The AE Program Aims, and Program graduate general and specialization outcomes are developed in light of the Academic Reference Standards for the Architectural Engineering (NARS-AE 2020), approved by the Faculty Council on its session dated 28/5/2020. These standards represent the minimum academic quality requirements for AE program.

6. Benchmarks

The Academic Reference Standards for the Electrical Power Engineering (ARS-EPE 2020), is developed based on the following benchmarks:

- Outcomes for Engineering graduates (NARS-2018), NAQAAE, 2018.
- Outcomes for Architectural Engineering graduates (NARS-2018), NAQAAE, 2018.
- Criteria for Accrediting Architectural Engineering Programs, UNESCO-UIA Validation Council for Architectural Education- 2017.

7. Curriculum Structure and Contents

7.1 Program duration:

- The program applies Credit Hour-System, the average student is expected to finish in a minimum of 8 semesters and maximum of 20 semesters, 164 Credit Hours.
- The teaching plan is distributed over **8 semesters**.

7.2 Program structure

Credit Hours and Student Workload (SWL) for Graduation Requirements' Categories

Graduation Requirements' Category	Credit Hours (CH)	SWL / CH / Week*	SWL / Category / Week	Total SWL / Category
University Requirements	13	2	26	416
Faculty Requirements	32	2.7	86.4	1382
Specialty Requirements	119	3	357	5712
Sub-Specialty Requirements				
CH / Program	**164**	**SWL / Program**		**7510**
Average SWL / Semester	**750**	**Average ECTS / Semester**		**30**

*Calculation of SWL / CH / Week for each Category
(For most of the courses of the category)

Category	CH	Structured SWL / Course / Week		Unstructured SWL / Course / Week	Total SWL / Course / Week	SWL / CH / Week
		Lecture	Tut/Lab			
University Req.	2	2	0	2	4	2
Faculty Req.	3	2	2	4	8	2.7
Specialty & Sub-specialty Req.	3	2	2	5	9	3

Overall data of the programs

#	Study Program	NC	Credits and SWL			Total Contact Hours				4 Requirements				BS%
			CH	SWL	ECTS	Lec	Tut	Lab	TT	UR %	FR %	DR %	PR %	
1	Architectural Engineering	59	164	750	30	98	122	17	237	8%	20%	35%	37%	16%
2	Interior Architecture Engineering	59	164	750	30	100	116	19	235					

CH	Total Credit Hours /program	NC	Total number of Courses / program
ECTS	European Credit Transfer System / program	UR	University Requirement
SWL	Total Student Workload / program	FR	Faculty Requirement
Lec	Total Lecture hours / program	DR	Discipline Requirement
Tut	Tutorial hours / program	PR	Program Requirement
Lab	Laboratory hours / program	BS	Basic Sciences Percentage TT
Total contact hours / program			

7.3 Program Courses

A. University Requirements *(13 credit hours)*

Compulsory Courses List *(9 credit hours)*

No.	Code	Course Title	CH
1	CSC 101	Introduction to Computers	2
2	ENG KET	English KET	2
3	ENG PET	English PET	2
4	GEN201	Practical Training 1	0
5	GEN301	Practical Training 2	0
6	GEN401	Practical Training 3	1
7	PSC 110	Human Rights	2

Elective Courses List *(4 credit hours)*

No.	Code	Course Title	CH
1	BSA H01	Administration of Small Projects	2
2	ENV 101	Environmental Science	2
3	HUM H09	Specific Computer Applications	2
4	PSC 101	Psychology	2
5	SCT 101	Scientific Thinking	2
6	SOC 101	Sociology	2

B. Faculty Requirements *(32 credit hours)*

No.	Code	Course Title	CH
1	EED160	Computer Programming	2
2	EMP111	Differentiation with Applications and Algebra	3
3	EMP112	Integration with Applications and Analytical Geometry	3
4	EMP121	Properties of Matter and Thermodynamics	4
5	EMP122	Electricity and Magnetism	4
6	EMP130	Engineering Mechanics	4
7	EMP140	Engineering Graphics	4
8	EMP150	General Chemistry	2
9	GENx11	Communication and presentation skills	2
10	GENx12	Engineering Ethics and Legislations	2
11	MEC161	Production Technology	2

C. Architectural Engineering Specialty Requirements *(57 credit hours)*

No.	Code	Course Title	CH
1	ARC213	Architectural Design 1	4
2	ARC214	Architectural Design 2	4
3	ARC223	History & Theories of Architecture 1	3
4	ARC233	Graphics & Visual Skills	3
5	ARC243	Building Construction & Materials 1	3
6	ARC244	Building Construction & Materials 2	3
7	ARC315	Architectural Design 3	4
8	ARC316	Architectural Design 4	4
9	ARC324	History & Theories of Architecture 2	3
10	ARC325	Human Studies in Architecture	2
11	ARC331	Computer Aided Drafting	2
12	ARC345	Building Construction & Materials 3	3
13	ARC346	Building Construction & Materials 4	3
14	ARC363	Environmental Control & Technical Installations	3
15	ARC371	Building Information Modeling (BIM)	2
16	EMP215	Mathematics, Statistics & Computers	2
17	SCM216	Theory of Structures	2
18	SCM218	Properties & Strength of Materials	2
19	SCM224	Surveying	2
20	SCM318	Reinforced Concrete & Foundations for Architects	3
		Subtotal	**57**

D. AE Program Sub-Specialty Requirements *(62 credit hours)*

Compulsory Courses *(54 credit hours)*

No.	Code	Course Title	CH
1	ARC317	Architectural Design 5	4
2	ARC418	Architectural Design 6	4
3	ARC419	Architectural Design 7	4
4	ARC326	History & Theories of Architecture 3	2
5	ARC427	History & Theories of Architecture 4	2
6	ARC351	Urban Planning 1	3
7	ARC454	Urban Planning 2	3
8	ARC455	Urban Design & Housing 1	3
9	ARC456	Urban Design & Housing 2	3
10	ARC453	Landscape Architecture	3
11	ARC373	Execution Designs 1	3
12	ARC474	Execution Designs 2	3
13	ARC475	Execution Designs 3	3
14	ARC483	Project Management & Feasibility Studies	2
15	ARC484	Buildings' Laws & Regulations	2
16	ARC491	Graduation Project Studies	2
17	ARC492	Graduation Project	5
18	SCM319	Steel Structures for Architects	3
		Subtotal	**54**

E. Elective Courses List *(8 CH)*

No.	Code	Course Title	CH
1	ARCE1X	Program Elective 1	2
2	ARCE2X	Program Elective 2	2
3	ARCE3X	Program Elective 3	2
4	ARCE4X	Program Elective 4	2
		Subtotal	**8**

8. Architectural Engineering Student Study Plan

Level 1 (FRESHMAN)

(*COMMON TO ALL ENGINEERING STUDENTS)*

Level 2 (SOPHOMORE)

Third Semester

(COMMON TO ALL ARCHITECTURAL ENGINEERING STUDENTS)

No.	Course		Weekly Hours					Prerequisite Courses
	Code	Title	Lec.	Tut/ Studio	Lab	Total	CrH	
1	ARC213	Architectural Design 1	2	4	0	6	4	EMP140
2	ARC223	History & Theories of Architecture 1	3	0	0	3	3	-
3	ARC243	Building Construction & Materials 1	1	4	0	5	3	EMP140
4	EMP215	Mathematics, Statistics & Computers	1	1	1	3	2	EMP112
5	ENG PET	English PET	2	0	0	2	2	ENG KET
6	SCM216	Theory of Structures	1	2	0	3	2	EMP130
Total			**10**	**11**	**1**	**22**	**16**	

Fourth Semester

(COMMON TO ALL ARCHITECTURAL ENGINEERING STUDENTS)

No.	Course		Weekly Hours					Prerequisite Courses
	Code	Title	Lec.	Tut/ Studio	Lab	Total	CrH	
1	ARC214	Architectural Design 2	2	4	0	6	4	EMP140
2	ARC233	Graphics & Visual Skills	2	3	0	5	3	EMP140
3	ARC244	Building Construction & Materials 2	1	4	0	5	3	ARC243
4	GENx11	Communication & Presentation Skills	1	2	0	3	2	-
5	SCM218	Properties & Strength of Materials	1	1	1	3	2	-
6	SCM224	Surveying	1	1	1	3	2	-
Total			**8**	**15**	**2**	**25**	**16**	

Summer Training

No	**Course**		**Contact Hours**	**CH**	**Prerequisite Courses**
	Code	Title			
1	GEN201	Practical Training 1	80 Contact Hours (2 Weeks × 40 hrs/Week)	**0**	Completion of 50 CH

Level 3 (JUNIOR)
Fifth Semester

(COMMON TO ALL ARCHITECTURAL ENGINEERING STUDENTS)

No.	Course		Weekly Hours					Prerequisite Courses
	Code	Title	Lec.	Tut/ Studio	Lab	Total	CrH	
1	ARC315	Architectural Design 3	2	4	0	6	4	ARC214 or ARC213
2	ARC324	History & Theories of Architecture 2	3	0	0	3	3	ARC223
3	ARC325	Human Studies in Architecture	2	0	0	2	2	-
4	ARC331	Computer Aided Drafting	1	0	2	3	2	CSC 101
5	ARC345	Building Construction & Materials 3	1	4	0	5	3	ARC244
6	UNV E01	University Elective 1	2	0	0	2	2	See List
Total			**11**	**8**	**2**	**21**	**16**	

Sixth Semester

(COMMON TO ALL ARCHITECTURAL ENGINEERING STUDENTS)

No.	Course		Weekly Hours					Prerequisite Courses
	Code	Title	Lec.	Tut/ Studio	Lab	Total	CrH	
1	ARC316	Architectural Design 4	2	4	0	6	4	ARC315 or ARC214
2	ARC346	Building Construction & Materials 4	1	4	0	5	3	ARC345
3	ARC363	Environmental Control & Technical Installations	2	3	0	5	3	-
4	ARC371	Building Information Modeling (BIM)	1	0	2	3	2	ARC331
5	SCM318	Reinforced Concrete & Foundations for Architects	2	2	0	4	3	SCM216
6	UNV E02	University Elective 2	2	0	0	2	2	See List
Total			**10**	**13**	**2**	**25**	**17**	

Summer Training

No	**Course**		**Contact Hours**	**CH**	**Prerequisite Courses**
	Code	Title			
1	GEN301	Practical Training 2	80 Contact Hours (2 Weeks × 40 hrs/Week)	**0**	GEN201

Level 3 (JUNIOR) – continued

Seventh Semester

(ARCHITECTURE STUDENTS) Sub-specialty

No.	Course		Weekly Hours					Prerequisite Courses
	Code	Title	Lec.	Tut/ Studio	Lab	Total	CrH	
1	ARC317	Architectural Design 5	1	6	0	7	4	ARC316 or ARC315
2	ARC326	History & Theories of Architecture	2	0	0	2	2	ARC324
3	ARC351	Urban Planning 1	2	2	0	4	3	As Advised
4	ARC373	Execution Design 1	1	4	0	5	3	ARC371+ARC346+ARC36
5	ARCE1X	Program Elective 1*	1	2		2	2	As Advised
6	SCM319	Steel Structures for Architects	2	2	0	4	3	SCM216
Total			**9**	**16**		**25**	**17**	

**Student is to choose ONE course From the Electives offered by the Department*

Level 4 (SENIOR)

Eighth Semester

(ARCHITECTURE STUDENTS) Sub-specialty

No.	Course		Weekly Hours					Prerequisite Courses
	Code	Title	Lec.	Tut/ Studio	Lab	Total	CrH	
1	ARC418	Architectural Design 6	1	6	0	7	4	ARC317 or ARC316
2	ARC427	History & Theories of Architecture 4	2	0	0	2	2	ARC326
3	ARC453	Landscape Architecture	2	2	0	4	3	ARC315
4	ARC455	Urban Design & Housing 1	2	2	0	4	3	ARC315
5	ARC474	Execution Design 2	1	4	0	5	3	ARC373
6	ARCE2X	Program Elective 2*	1	2		3	2	As Advised
Total			**9**	**16**		**25**	**17**	

**The student is to choose ONE course From the Electives offered by the Department*

Summer Training

No	**Course**		**Contact Hours**	**CH**	**Prerequisite Courses**
	Code	Title			
1	GEN401	Practical Training 3	80 Contact Hours (2 Weeks x 40 hrs/Week)	**1***	GEN301

**Student scores 1 Credit Hour upon successful completion of 240 training hours*

Level 4 (SENIOR) - continued
Ninth Semester
(ARCHITECTURE STUDENTS) Sub-specialty

No.	Course		Weekly Hours					Prerequisite Courses
	Code	Title	Lec.	Tut/ Studio	Lab	Total	CrH	
1	ARC419	Architectural Design 7	1	6	0	7	4	ARC418 or ARC317
2	ARC454	Urban Planning 2	2	2	0	4	3	ARC351
3	ARC456	Urban Design & Housing 2	2	2	0	4	3	ARC455
4	ARC475	Execution Design 3	1	4	0	5	3	ARC474
5	ARC491	Graduation Project Studies **	2	0	0	2	2	ARC418+ARC427+ARC455
6	ARCE3X	Program Elective 3*	1	2		3	2	As Advised
Total			**9**	**16**		**25**	**17**	

**Student is to choose ONE course From the Electives offered by the Department*
***Student must have succeeded in 116 CH + the pre-requisites to register the course*

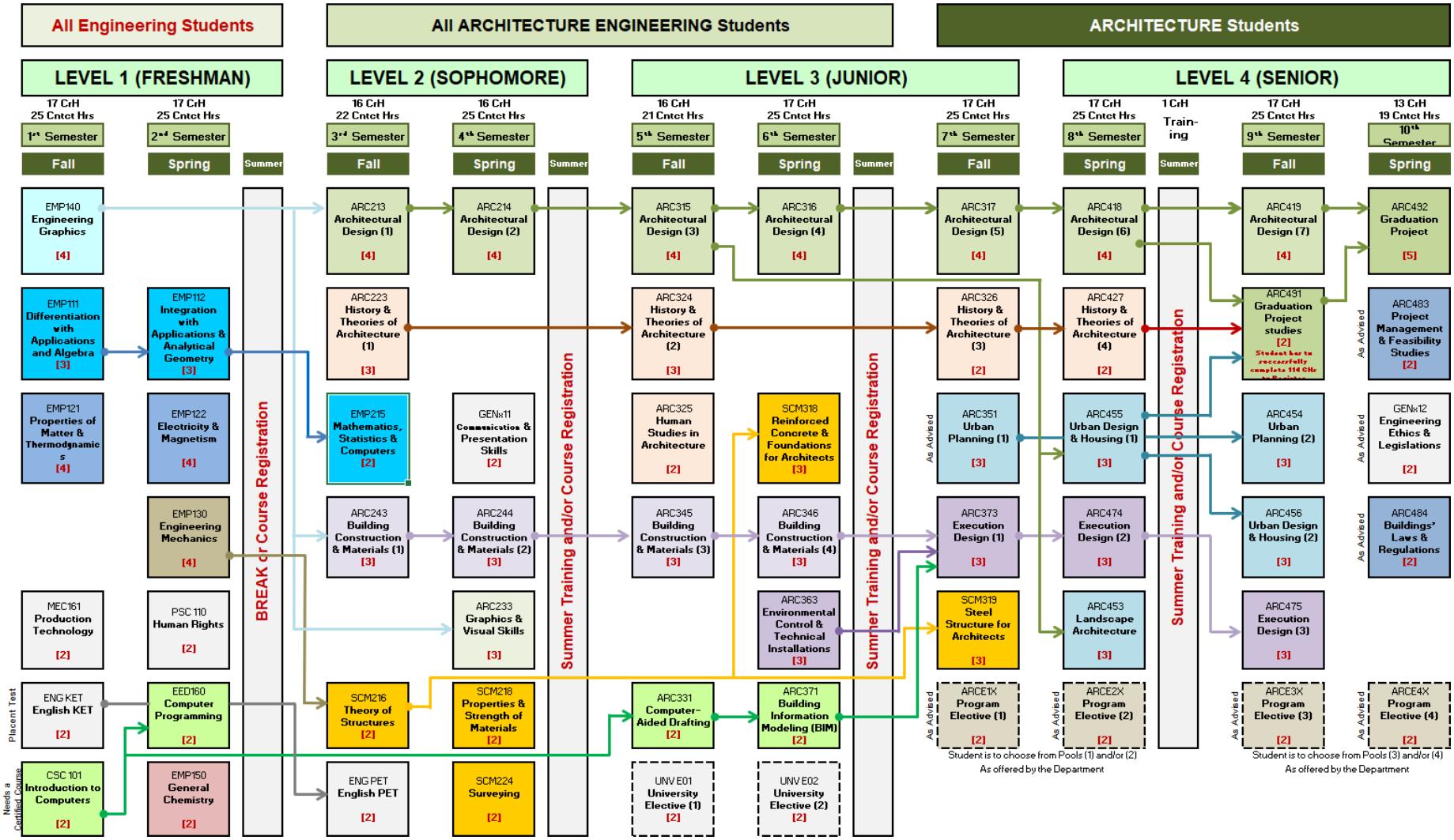
Tenth Semester
(ARCHITECTURE STUDENTS) Sub-specialty

No.	Course		Weekly Hours					Prerequisite Courses
	Code	Title	Lec.	Tut/ Studio	Lab	Total	CrH	
1	ARC483	Project Management & Feasibility Studies	1	2	0	3	2	Level 4 Student
2	ARC484	Buildings' Laws & Regulations	1	2	0	3	2	Level 4 Student
3	ARC492	Graduation Project	1	7	0	8**	5	ARC419+ARC491
4	GENx12	Engineering Ethics & Legislations	2	0	0	2	2	As Advised
5	ARCE4X	Program Elective 4*	1	2		3	2	As Advised
	Student may register any missing courses – if needed – to graduate							
Total			**6**	**13**		**19**	**13**	

**Student is to choose ONE course From the Electives offered by the Department*
***This number does not account for the contact hours during the four weeks following the final exams*

9. Architectural Engineering Program (164 CH) Courses' Tree

* Summer Training: A total of 240 hours - at least - during the whole study program Credited for 1 CH



10. Internal Regulations of the Undergraduate Programs

Article (2): Admission Requirements

Students eligible for enrollment in the Faculty are those holding the Egyptian General Secondary Education Certificate (Thanaweya Amma) or any equivalent certificate, or those transferred from other universities, in accordance with the rules and conditions issued annually by the Egyptian Council of Private and Community Universities (CPU).

Article (3): Study System

- The system of study of all the academic programs offered by the faculty is the credit hour system, in which one Credit Hour (CH) is granted for:
  - One contact hour of a weekly lecture over a 15-week semester.
  - Two-three contact hours of a weekly tutorial/ lab/ workshop/ studio over a 15-week semester.
- One contact hour is divided into a 50-minute session of instruction plus a 10-minute break.
- English is the language of instruction. It should be used for lecturing, discussions, and exams.

Article (4): Student Study Level

The student's study level is related to the credit hours he/she has completed successfully in percent of total CH of the program as follows:

Study Level	CH Completed Successfully in Percent of Total CH of the Program	Study Level Title
1	Less than 20%	Freshman
2	From 20% to less than 40%	Sophomore
3	From 40% to less than 70%	Junior
4	From 70% to less than 100%	Senior

Article (5): Academic Semesters and Course Registration

The academic year is composed of three study semesters:

- The first main semester (Fall Semester) usually starts late September and lasts for 15 weeks, followed by final exams for 3 weeks. Courses are registered within three weeks before the start of the semester.
- The second main semester (Spring Semester) usually starts early February and lasts for 15 weeks, followed by final exams for 3 weeks. Courses are registered during the week before the start of the semester.
- The Summer semester, which is an elective semester, starts late June or early July and lasts for 7 weeks, followed by 1-week final exams. Courses are registered during the week before the start of the semester.

Article (6): Program Study Duration

- The program study duration should not be less than 8 main semesters.
- The maximum allowed study duration is 20 main semesters (10 years), not including the semesters suspended for reasons accepted by the Faculty Council. After such period, the student is dismissed from the program.

Article (7): Academic Advising

The Academic Advisor is a Faculty member who is assigned the duty of counseling and monitoring a group of students. The academic advisor is responsible for assisting the student in selecting his academic track as well as in selecting courses for each semester. The academic advisor may ask the student to repeat courses which he/she already passed to raise his/her Cumulative Grade Point Average (CGPA) to that required for graduation. Also, the academic advisor assists the student in selecting the practical training and graduation project.

Article (8): Academic Load

- In a main semester (Fall or Spring), the academic load of the student, which he/she selects with the help of the academic advisor, may reach:
  1. Up to 21 credit hours for students with Cumulative Grade Point Average (CGPA) greater than or equal to 3.0.
  2. Up to 18 credit hours for students with CGPA greater than or equal to 2.0.
  3. Up to14 credit hours for students with CGPA less than 2.0.
- During the final semester of his/her study, the student can register an overload of no more than 3 CH over the upper limits mentioned before, based on the academic advisor's recommendation and approval of the Dean.
- In the Summer semester, the student may register up to 7 credit hours for any student, regardless of his/her CGPA.

Article (9): Add, Drop, and Withdraw of Courses

A student may add/drop courses within the first two weeks of a main semester, or the first week in a Summer semester, without incurring any penalty. After such time and no later than the 12th week of a main semester, or the 4th week of a Summer semester, a student may withdraw registered courses. In this case, the course(s) fees will not be refunded; nonetheless, the student is given a Withdrawn grade (W), and his/her CGPA will not be affected on account of such course(s) withdrawal.

Article (10): Incomplete Courses

If the student did not attend the final exam of the course with an excuse accepted by the Faculty Council, he/she gets a final grade Incomplete (I) in this course. The grade "I" is not included in calculating the Cumulative Grade Point Average (CGPA). In this case, the final exam will be postponed for the student till the beginning of the next semester while the student's semester work marks are kept. If the student didn't attend the final exam on the announced date without an excuse accepted by the Faculty Council, he/she gets a Fail (F) grade in the final examination.

Article (11): Semester Withdrawal

- The student has the right to withdraw from an academic semester within the withdrawal period, announced in the academic calendar of the semester.
- The student will be considered failed if he/she withdraws after the withdrawal period unless he/she has a valid reason which is accepted by the Faculty Council.

Article (12): Course Repeating

Repeating a course requires attending all its activities, including lectures, exercises, and exams. Two cases are considered for course repeating:

1. Retaking a passed Course

A student may repeat a previously passed course, aiming to improve his/her CGPA, subject to the following conditions:

A1. The student will get the highest grade among the two attempts, and this grade will be used in the calculation of the CGPA. All grades will appear in the academic record.

A2. The student may improve a maximum of 5 courses during the program study duration, excluding the extra courses required for getting out of the academic warning or satisfying the graduation requirements.

A3. If the student fails in the retake for improvement, without a valid excuse accepted by the Faculty Council, the grade of the first take will be disregarded, and he/she will get the Fail grade (F).

2. Retaking a Failed Course

A student who completes a course with failing grade (F) is subject to the following conditions:

B1. Fail grade (F) for any course shall be recorded on the student's transcript and is counted in the calculation of the semester GPA and CGPA, whether the course is compulsory or elective.

B2. If a student fails a compulsory course in any semester, he/she must retake this course in a subsequent semester.

B3. If the student fails an elective course, he/she may retake the same course or another elective course, after the approval of his/her academic advisor.

B4. When the student passes a previously failed course, the highest grade recorded for him/her is B+.

Article (13): Attendance Policy

The student is required to attend all classes of the course he/she registers for. A student who is absent for more than 15% of the total contact hours of the course without an acceptable excuse is given an academic warning. A student who is absent for more than 25% of the course hours without a valid excuse accepted by the Faculty Council shall be deprived from taking all the following activities and/or examinations scheduled for that course and shall be given a Fail (F) grade.

The student can withdraw from a course if his absence ratio exceeds 25% during the first 12 weeks of the semester. If the absence ratio exceeds 25 % after the first 12 weeks, the student will not be allowed to withdraw the course.

Article (14): Course Assessment Policy

The Marks of a given course (100 Marks) are distributed on the semester's work and the final exam according to the nature of the course. The assessment policy must be declared to the students through course syllabus before the start of the course. Most of the Faculty courses comply with the regular assessment scheme of marks distribution, given below:

A1. Final Exam

The final exam constitutes 40 Marks. It shall be a comprehensive exam covering all course topics.

A2. Midterm Exam

The midterm exam constitutes 30 Marks. It shall be conducted during the 8th-9th weeks. Exam date should be announced to students. The graded midterm exam and its model answer should be discussed in class.

A3. Other assessment components

Other assessment components, which constitute 30 Marks, include: Quizzes, Assignments, Practical exams (if exist), Oral exams (if any), Course report/ project (if any), student's Performance and Participation.

1. Courses not complying with the regular assessment scheme of item (A) are characterized by adding a row, containing the adopted marks distribution, to the corresponding table of the course description of this Bylaw.
2. The distribution of marks of a course can be modified after the approval of the Faculty Council based on a proposal by the Scientific Department offering that course.

Article (15): Course Grading

- There are two conditions to pass a regular course:
  1. The student must attend the final exam and obtain at least 40% of its grade.
  2. The overall marks of the student for all assessment components of the course must be at least 60 Marks out of 100 Marks.
- For non-credit courses (0 CH), the earned grade is either Pass or Fail (P/F). Pass grade means the student obtained at least 60% of the course marks. The grade of non-credit courses shall not be included in the CGPA calculation.
- The following grading system is adopted by the faculty for all the offered courses:

Grade	Percentage Marks	Grade Points	Grade	Percentage Marks	Grade Points
A+	97% and higher	**4.0**	**C+**	73% to less than 76%	**2.3**
A	93% to less than 97%	**4.0**	**C**	70% to less than 73%	**2.0**
A-	89% to less than 93%	**3.7**	**C-**	67% to less than 70%	**1.7**
B+	84% to less than 89%	**3.3**	**D+**	64% to less than 67%	**1.3**
B	80% to less than 84%	**3.0**	**D**	60% to less than 64%	**1.0**
B-	76% to less than 80%	**2.7**	**F**	Less than 60%	**0.0**

- In addition to the regular grades, the non-credit grades are:

Grade	Meaning	Description
P/F	Pass/Fail	Grades for non-credit hour courses
I	Incomplete	According to the conditions of Article (10)
W	Withdrawn	According to the conditions of Article (11)

Article (16): Grade Appeal

A student can submit an appeal to review his course marks within 2 weeks from the course results announcement, and after paying the required fees in accordance with the Faculty regulations. In case of general complaints, a committee formed by the Scientific Department, with participation of the course instructor, should review the marks of all students.

Article (17): Calculation of Grade Point Average

- The Course points are the result of multiplying the grade points the student earned for that course by the credit hours of the course.
- The Grade Point Average (GPA) is calculated by dividing the total number of semester course points by the total number of semester hours attempted as follows:

$$GPA = \frac{\sum CH\ of\ each\ semester\ course \times course\ points}{\sum CH\ of\ graded\ semester\ course}$$

- The Cumulative Grade Point Average (CGPA) is calculated by dividing the total number of course points accumulated by the total number of credit hours attempted, as follows:

$$CGPA = \frac{\sum CH\ of\ each\ course\ attempted \times course\ points}{\sum CH\ of\ graded\ course\ s}$$

Article (18): Probation, and Dismissal

If the CGPA of a student drops below 2.0, he/she is placed under probation and is not allowed to register more than 14 credit hours per semester until his/her CGPA reaches 2.0 at least**.** A written warning should be sent to the student under probation and a copy of it is forwarded to his/her parents or guardians.

- The student will be dismissed from the university under the following situations:
  - If his/her CGPA drops below 2.0 throughout FIVE consecutive semesters, excluding Summer semesters.
  - If the student did not achieve the graduation requirements through the maximum allowed study duration.
- In dismissal situations, the student may apply to the Dean an appeal for continuing the study, supported by documents of his/her social and/or health condition. The Dean shall discuss the appeal with the Faculty Council. For a student who has successfully completed 80% of graduation requirements, the Faculty Council may give him/her a last chance of TWO extra main consecutive semesters to improve his/her CGPA before he/she is finally dismissed.

Article (19): Selection and Transfer of Study Programs

- To be eligible to join a study program, the student must earn at least 18 credit hours with a CGPA greater than or equal to 1.0.
- Every new academic year, the Faculty Council establishes general rules for the distribution of students eligible to the different programs considering:
  - the student preferences
  - the principle of equal opportunities
  - the requirements stated by the department offering the program
  - the available capacity of the program
- The student may change his/her specialization or be required to change it by a university action based on:
  - the student's will, and/or the recommendations of the Academic Advisor
  - approval of the Faculty Dean

Article (20): Graduation Projects

The Graduation Project represents the crowning achievement of an Engineering student's undergraduate experience. The student will be eligible to register the first course of the graduation project upon completing not less than 120 CH. The Faculty Council may permit decreasing this limit to 115 CH upon a request by the Academic Advisor and subject to special cases. The graduation project spans two main semesters.

Graduation projects apply both engineering knowledge and skills to the solution and design of real-world applications. The work done has to be based on the knowledge and skills acquired during the course work. The first part of the project should include a survey of the project subject area with reference to appropriate literature, and the time schedule for the design and implementation phases of the project. The project is considered as a decision-making process in which the basic science and mathematics as well as engineering sciences are integrated to convert resources optimally to meet a stated objective. Among the fundamental elements of the design process are the establishment of objectives and criteria, synthesis, analysis, construction, testing and evaluation. The student has to take into consideration the appropriate engineering standards and multiple constraints during the different phases of the project.

The engineering design must include most of the following features: development of student creativity, use of open-ended problems, development and use of modern design theory and methodology, formulation of design problem statements and specification, consideration of alternative solutions, feasibility considerations, concurrent engineering design, and detailed system description. Further, it is essential to include a variety of realistic constraints, such as economic factors, safety, reliability, aesthetics, ethics and social impact.

One extra month after the end of the second semester is available for the students to finalize their work. The supervisor evaluates the contribution of each student during the different phases of the project. A printed version of the project report beside the final product of the project work should be submitted to the Department prior to the date of discussion. The jury members from academy and industry evaluate the student work based on a submitted documents and final product, oral presentation and discussion. In case the student failed in the project, he/she is given a grace semester and will be eligible to present and defend the project by the end of the grace semester.

Article (21): Practical Training

Practical training is a part of all the study programs of the Faculty. The overall duration of the training is 240 hours, divided over 3 modules (80 hours each), and should be carried out during two or three summer semesters at one or more engineering facilities (inside or outside Egypt). The training program shall be related to the specialization of the study program in which the student is registered and must be approved by the scientific department offering the program. The student is eligible to register the first training module after completing the courses of Level Two (or a minimum of 50 CH). The student may practice at most one on-campus training module (80 hours) offered by the faculty. After completing each module, the student shall submit a report and conduct a presentation to be evaluated by the scientific department. The three training modules are equivalent to 1 CH.

Article (22): Graduation Requirements

To be awarded the Bachelor of Science (B.Sc.) Degree in Engineering and Technology, students must successfully complete 164 credit hours with a Cumulative Grade Point Average (CGPA) of 2.0 (C) or higher.

Article (23): Rank of Honor

To obtain the Rank of Honor, the student must:

- have a GPA not less than 3.3 in all study semesters,
- have not failed any course during the duration of the program,
- have no disciplinary sanctions (punishment) imposed on him during the duration of the program.

Article (24): Modification of Bylaw

The Faculty Council can perform some minor modifications on this Bylaw without referring to the Committee of Engineering Sector - Supreme Council of Egyptian Universities. Examples of the possible modifications are:

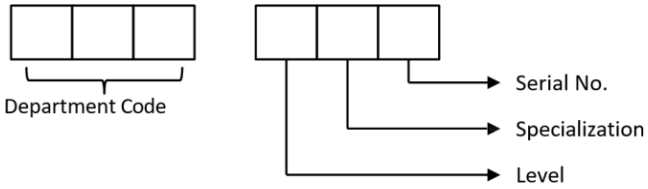
- Adding elective courses
- Modification of course contents (not more than 50%)
- Modification of marks distribution of a course
- Modification of contact hours of a course without changing its credit hours

Article (25): Provisions of Bylaws

- Following the issuance of the ministerial decree, and provided that the necessary clearing procedure is made, this bylaw shall be applicable to new students to be admitted to the Faculty starting from Fall 2021, as well as to the students already enrolled in the Faculty and earning 34 CH or less (Level-One students) by Fall 2021. The Faculty Council may add other student categories to the above, based on a study conducted by the academic advisors, for the purpose of appropriate implementation of these Bylaws.
- Any student, who is currently enrolled in the Faculty, can apply to the Dean requesting transfer to these Bylaws upon issuing the ministerial decree. If the Faculty Council approves his/her request, the necessary clearing procedure is made.

Article (26): Course Coding System

The course code starts by the abbreviation of the Department/ Program/ Specialization as per the table below, followed by 3 digits: The Course level, the Area of specialization number, and the course number within the Area.



FET Course Coding

11. Program Outcomes Teaching & Assessment Methods

The following methods are used in teaching for most cases. But for further details refer to the course's specifications.

- Interactive lecture
- Discussion
- Problem solving
- Lab. Experiments
- Projects
- Reports & presentations

The following methods are used to assess the program Outcomes in most cases. But for further details refer to the course's specifications.

- Written Exams
- Lab. Experiments
- Quizzes & Assignments.
- Projects
- Reports / Researches

12. Evaluation of Program Intended Learning Outcomes

Evaluator	**Tool**	**Sample**
Faculty members	Final Exams Results	100%
Faculty members	Evaluation sheet	100%
Senior student	Questionnaire	20 to 25%
Alumni	Questionnaire	10 to 15%
Stakeholders	Questionnaire / Interview	Represent different sectors
Internal Evaluator	Evaluation report	1
External Evaluator	Evaluation report	1

13. Appendices

- Table [1] Matrix of Program Aims Vs Institute's Mission
- Table [2] Matrix of Program Aims Vs NARS-2018 Engineers Attributes
- Table [3] Matrix of Program Aims Vs. Program Outcomes
- Table [4.2] Matrix of NARS 2018 Outcomes Vs Engineering Outcomes
- Table [4.2] Matrix of NARS 2018 Outcomes Vs Program Outcomes
- Table [5] Matrix of Courses with Program Outcomes

Table [1] Matrix of Program Aims Vs Institute Mission

Institute's Mission	Program Aims									
	PA1	**PA2**	**PA3**	**PA4**	**PA5**	**PA6**	**PA7**	**PA8**	**PA9**	**PA10**
The Faculty of Engineering and Technology at Future University in Egypt provides a promising academic and cultural environment that enables the graduation of outstanding engineers who are capable of competing nationally and regionally	■	■				■	■	■		■
And well acquainted with the job market professionally and ethically.			■	■					■	
It also motivates conducting innovative scientific research		■		■						
And contributes to community serving and development.										■

Table [2] Matrix of Program Aims Vs the NARS-2018 Engineers Attributes

NARS 2018 Attributes of the Graduates of Engineering	Program Aims									
	PA1	PA2	PA3	PA4	PA5	PA6	PA7	PA8	PA9	PA10
1) Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;		■								
2) Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation	■									
3) Behave professionally and adhere to engineering ethics and standards				■						
4) Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance					■					
5) Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community										■
6) Value the importance of the environment, both physical and natural, and work to promote sustainability principles							■			
7) Use techniques, skills and modern engineering tools necessary for engineering practice								■		
8) Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies						■				
9) Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner			■							
10) Demonstrate leadership qualities, business administration and entrepreneurial skills									■	

Table [3] Matrix of Program Aims Vs. Program Outcomes

Architectural Engineering (AE) Program aims	Outcomes for Engineering Graduate										Outcomes for AE Program's Graduate					Outcomes for IAE Program's Graduate			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	PO16	PO17	PO18	PO19
PA1. Identify, formulate, and solve complex architectural engineering problems by applying principles of engineering, science, and mathematics.	■				■						■	■				■			
PA2. Apply architectural engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.						■										■			
PA3. Communicate effectively with a range of audiences.								■							■		■		■
PA4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of architectural engineering solutions in global, economic, environmental, and societal contexts.			■										■					■	

PA5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.																		
PA6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.																		
PA7. Acquire and apply new knowledge as needed, using appropriate learning strategies.																		
PA8. Use techniques, skills and modern engineering tools necessary for architectural engineering practice.																		
PA9. Demonstrate leadership qualities, business administration and entrepreneurial skills.																		
PA10. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community																		

Table [4.1] Matrix of NARS 2018 Outcomes Vs Engineering Outcomes

NARS 2018 Engineering Graduate Competencies	Architectural Engineering Department Graduate Competencies									
	(Level A - Engineering) General Graduate Competencies									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	■									
2. 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		■								
3. 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			■							
4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.				■						
5. Practice research techniques and methods of investigation as an inherent part of learning.					■					
6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.						■				
7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.							■			
8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.								■		
9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.									■	
10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.										■

Table [4.2] Matrix of NARS 2018 Outcomes Vs Program Outcomes

NARS 2018 Architectural Engineering Graduate Competencies	Architectural Engineering Department Graduate Competencies														
	General Graduate Competencies										Level B Architecture engineering				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
3.1 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.											■				
3.2 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.												■			
3.3 Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of : structural design, construction, technology and enginnering problems associated with building designs.													■		
3.4 Transform design concepts into buildings and integrateplans into overall planning within thr constraints of: project finiancing, project management, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations and procedures involved.														■	
3.5 Prepare design project briefs and documents, and understand the context of the architect in the construction industry, including the architects role in the processes of bidding, procurement of architectural services and building production															■

Table [5] Matrix of Courses with Program Outcomes

Code	Course Title	(Level A - Engineering)										Level B Architecture engineering				
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
ARC101	Computer-Aided Drafting	■	■		■				■	■						
ARC111	Graphics & Visual Skills	■	■						■	■		■	■			
ARC121	History & Theories of Architecture (1)	■				■		■				■	■			■
ARC210	Architectural Design (1)	■	■	■		■			■	■		■	■	■	■	■
ARC222	History & Theories of Architecture (2)	■				■		■				■	■			■
ARC234	Building Construction & Materials (1)	■	■	■	■	■							■	■	■	
ARC245	Building' Laws & Regulations	■	■	■	■						■		■	■	■	■
ARC271	Building Information Modeling (BIM)	■	■		■		■								■	
ARC211	Architectural Design (2)	■	■	■		■			■	■		■	■	■	■	■
ARC235	Building Construction & Materials (2)	■	■	■	■	■							■	■	■	
ARC253	Landscape Architecture		■			■	■	■	■	■	■	■	■			■
ARC272	Computer Applications	■	■		■				■	■						
SCM218	Steel Structure for Architects	■	■	■			■					■	■	■	■	
SCM219	Properties & Strength of Materials	■	■	■			■					■	■	■	■	
ARC310	Architectural Design (3)	■	■	■			■					■	■	■	■	
ARC321	History & Theories of Architecture (3)	■	■	■			■					■	■	■	■	
ARC336	Building Construction & Materials (3)	■	■	■			■					■	■	■	■	
ARC352	Urban Planning	■	■	■			■					■	■	■	■	
ARC362	Environmental Control & Technical Installations	■	■	■			■					■	■	■	■	
SCM317	Reinforced Concrete & Foundations for Architects	■	■	■			■					■	■	■	■	
ARC311	Architectural Design (4)	■	■	■			■					■	■	■	■	
ARC355	Urban Design & Housing	■	■	■			■					■	■	■	■	
ARC374	Execution Design	■	■	■			■					■	■	■	■	
ARCExx	Program Elective (B)	■	■	■			■					■	■	■	■	
ARCExx	Program Elective (B)	■	■	■			■					■	■	■	■	

ARC410	Architectural Design (5)															
ARC411	Graduation Project studies															
ARC472	Building Technology (1)															
ARCExx	Program Elective (A)															
ARCExx	Program Elective (A)															
ARCExx	Program Elective (A)															
ARC412	Graduation Project															
ARC473	Building Technology (2)															
ARCExx	Program Elective (A)															
ARCExx	Program Elective (B)															
ARCExx	Program Elective (B)															