



Architectural department
Faculty of Engineering Benha
Benha University

ARCHITECTURE ENGINEERING PROGRAM

Architectural Department Program



Program specification – Bylaw 2017

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A- Basic Information

Program Title	Architectural Engineering Program
Program Type	<input checked="" type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> Multiple
Department responsible of program	Architectural Engineering
Program Coordinator	Prof. Dr. Zeinab Faisal
Quality Coordinator	DR Kamal Elgabalawy
Date of program Approval	2017
Date of Internal Evaluator	June 2023
Internal Evaluator	Dr. Ahmed Abd El Rasoul
Date of External Evaluator	August 2023
External Evaluator	Dr. Gehan El Sayed
Program URL	arch.prog@beng.bu.edu.eg

B- Professional Information

1. Program Mission

The architecture program at the Faculty of Engineering Benha is committed to preparing an architect who is intellectually and scientifically qualified and has the ability to compete in the labor market and keep pace with scientific and technological development in the field of architecture in a manner that serves and achieves the needs of society within the framework of an ethical approach that allows continuous improvement and preservation of the environment and society.

2. Program Objectives

The objectives of the BSc in The Architectural Engineering Program are to enable its graduates to:

PO1. Apply a wide spectrum of fundamentals of the science and specialized skills with analytic, creativity and critical thinking to identify and solve architecture design problems in real life situation.

PO2. Prepare qualified innovative architects who can adhere to architectural engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.

PO3. Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.

PO4. Use techniques, skills, and modern engineering tools necessary for architectural engineering practice.

PO5. Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.

PO6. Strengthening students' ability to make decisions, solve problems, and develop architectural and urban solutions to develop and serve the local community.

PO7. Create architectural designs that satisfy both aesthetic, technical and meet building users' requirements.

3. Graduates Attributes

The graduate of the Architectural Engineering Program must be able to:

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
11. Knowing the laws, legislations and requirements in the field of architecture and urbanism and how to apply them to meet local needs and global developments.

12. The ability to combine outstanding creative and innovative design with technological development to improve the quality of the built environment and meet social, technological, and environmental challenges.
13. Solve architectural problems with a wide range of complexity and variation throughout applying analytic critical and systemic thinking.
14. Demonstrate understanding of cultural, historical and established architectural theories, philosophies and context.

4. Program Learning Outcomes (PLO's)

The program courses fulfill the NARS 2018

Level A: The engineering graduate must be able to:

A1- PLO1: Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.

A2- PLO2: 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- PLO3: 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- PLO4: Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.

A5- PLO5: Practice research techniques and methods of investigation as an inherent part of learning.

A6- PLO6: Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.

A7- PLO7: Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.

A8- PLO8: Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.

A9- PLO9: Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

A10-PLO10: Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.

Level B: Architecture Engineering Graduate must be able to:

B1- PLO11: 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- PLO12: 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- PLO13: Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of: structural design, construction, technology and engineering problems associated with building designs.

B4- PLO14: 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- PLO15: 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. Program Academic Standards

Academic reference Standards of Architectural Engineering Program approved by department council on 18-9-2022 and faculty council on 11-10-2022

6. Reference Standards

National Academic reference Standards of 2018 which were issued by the National Authority for Quality Assurance & Accreditation of Education NAQAAE.

7. Program Structure and Contents

7.1 Program Duration:

Five years (10 semesters)

7.2 Program Structure:

Total hours of the program:-	231 hours
Theoretical:-	131 hours
Practical/Exercises:-	100 hours
Compulsory:-	213 hours
Elective Course:-	16 hours
Humanity – Elective :-	2 hours
Selective:-	none

Head of Department: Prof. Dr. Zeinab Faisal

Date: 6 / 9 / 2022



7.3 Program Courses VS Requirements

7.3.1 List of Compulsory Courses

Year	Program Courses		Weekly Contact Hours			Credit Hours of Subject Area							Requirements		
	Code	Course Title	Lect.	Tut.	Lab.	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary	University Requirements	Faculty University	Program Requirements
Preparatory Year	B 1011	Mathematics (1) (a)	4	2	0		5							*	
	B 1012	Mathematics 2	4	2	0		5							*	
	B 1021	Mechanics (a)	4	1	1		5							*	
	B 1022	Mechanics (b)	4	1	1		5							*	
	B 1031	Physics (a)	4	0	2		5							*	
	B 1032	Physics (b)	4	0	2		5							*	
	B 1041	Chemistry (a)	2	0	2		3							*	
	B 1042	Chemistry (b)	2	0	2		3							*	
	M 1071	Producion Eng & Workshops (a)	2	0	3		3							*	
	M 1072	Producion Eng & Workshops (b)	0	0	3		1							*	
	M 1002	Technology & society	2	0	0	2								*	
	E 1021	Computer Fundamentals and Programming (a)	0	0	2					1				*	
	E 1022	Computer Fundamentals and Programming (b)	0	0	2					1				*	
	M 1061	Eng. Drawing (a)	0	0	3			1						*	
	M 1062	Eng. Drawing (b)	0	0	3			1						*	
	U 1011	Technical English Language	0	0	2	1							*		
	U 1012	Technical English Language	0	0	2	1							*		

Year	Program Courses		Weekly Contact Hours			Credit Hours of Subject Area							Requirements		
	Code	Course Title	Lect.	Tut.	Lab.	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary	University Requirements	Faculty University	Program Requirements
1st Year	AE1112	Architecture Design 1B	3	7	0	1		1	2		2				*
	AE1121	Building Construction 1A	2	4	0			1	3						*
	AE1122	Building Construction 1B	2	4	0			1	3						*
	AE1131	History & Theory of Architecture 1A	2	2	0	1		2							*
	AE1132	History & Theory of Architecture 1B	2	2	0	1		2							*
	AE 1171	Theory of Structure	3	2	0			4							*
	AE 1172	Plane Surveying	2	2	0			3							*
	AE 1174	Properties of materials	2	2	0			3							*
	AE1101	Visual Training	2	5	0			4							*
	AE1102	Perspective and Sciography	2	4	0			4							*
	U1103	English Language	0	0	2	1							*		
	U1104	Human Rights	2	0	0	2							*		

Year	Program Courses		Weekly Contact Hours			Credit Hours of Subject Area							Requirements		
	Code	Course Title	Lect.	Tut.	Lab.	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary	University Requirements	Faculty University	Program Requirements
2nd Year	AE1211	Architecture Design 2A	3	7	0				5		1				*
	AE1212	Architecture Design 2B	3	7	0				5		1				*
	AE1221	Building Construction 2A	2	4	0				3		1				*
	AE1222	Working Drawings & Const.Methods (1)	2	4	0				3		1				*
	AE1231	History&Theory of Architecture 2A	2	2	0	1		2							*
	AE1232	History&Theory of Architecture 2B	2	2	0	1		2							*
	AE 1271	Reinforced Concrete and Foundations 1	2	2	0			3							*
	AE1272	Reinforced Concrete and Foundations 2	2	2	0			3							*
	AE 1216	Technical Installations	2	4	0			4							*
	AE1201	Environmental Control	2	3	0							3			*
	AE1202	Human Studies in Architecture	2	2	0	1						2			*
	AE1203	Computer application 1	2	0	3					3					*

Year	Program Courses		Weekly Contact Hours			Credit Hours of Subject Area							Requirements		
	Code	Course Title	Lect.	Tut.	Lab.	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary	University Requirements	Faculty University	Program Requirements
3rd Year	AE1311	Architectural Design 3A	3	7	0				4	1	1				*
	AE1312	Architectural Design 3B	3	7	0				4	1	1				*
	AE 1321	Working Design 1A	2	6	0				3	1	1				*
	AE1322	Working Design 1B	2	6	0				3	1	1				*
	AE1331	History&Theory of Architecture 3A	2	2	0			3							*
	AE1332	History&Theory of Architecture 3B	2	2	0			3							*
	AE 1361	Town Planning (I)	2	4	0				2	1		1			*
	AE1362	Urban Design(1)	2	4	0				2	1		1			*
	AE13**	Elective A	2	2	0	1			2						*
	AE1301	Computer Application 2	2	0	2					3					*
	AE 1302	Technical Report	2	0	0	2									*
	AE 1303	Peronals Skills	2	0	0	2									*

Year	Program Courses		Weekly Contact Hours			Credit Hours of Subject Area							Requirements		
	Code	Course Title	Leet.	Tut.	Lab.	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary	University Requirements	Faculty University	Program Requirements
4th Year	AE 1411	Architecture Design (4)	3	7	0				2	2	2				*
	AE1421	Working Dr.&Const.Methods (2)	2	6	0				2	2	1				*
	AE14**	Elective B	2	4	0	2			2						*
	AE14**	Elective C	2	4	0					2		2			*
	AE15**	Elective D	2	4	0					2		2			*
	AE15**	Elective E	2	4	0					2		2		*	
	AE1400	Field Training	0	0	2							1			*
	AE 1402	profession practice & Legislations	2	2	0					3					*
	AE 1500	Graduation Project	5	13	2				1	1	9	1			*
						Total (H)	21	40	48	53	28	24	15		
						% (H)	9%	16%	20%	22%	11%	10%	6%		
						Ref. (%)	9-12%	20-26%	20-23%	20-22%	9-11%	8-10%	6-8%		

7.3.2 List of Elective Courses

Year	Program Courses	
	Code	Course Title
Elective A	AE 1324	Building Technology
	AE 1364	Site Planning and Landscape Architecture
	AE1352	Introduction to Environmental Studies
	AE 1382	Computer Application 3
Elective B	AE1461	Town Planning (2)
	AE1463	Urban Design2
Elective C	AE1413	Principals Interior design
	AE 1465	Computer Aided Analysis (Information Systems) (1)
	AE 1451	Computer Aided Environmental Design
Elective E:	AE1411	Analytical Skills and Critical Thinking
	AE 1562	Computer Aided Analysis (Information Systems) (2)
	AE 1512	Architectural Criticism
	AE 1514	Interior Design
	AE1516	Aesthetics and Form Generation
	AE 1552	Environmental Assessment & Rating Tools in Building
	AE1532	Architecture of Islamic Societies
	AE1522	Project management
AE1524	Quantities & Specifications	

8. Subject Area

Subject Area	Required	Program Total Credit Hours	
		Total hours of five Levels	% Hours of five Levels
Humanities and Social Sciences	9-12%	21	9%
Mathematics and Basic Sciences	20-26%	40	16%
Basic Engineering Sciences	20-23%	48	20%
Applied Engineering and Design	20-22%	53	22%
Computer Applications and ICT	9-11%	28	11%
Projects and Practice	8-10%	24	10%
Discretionary	6-8%	15	6%

9. Program Admission Requirements

Following the below clauses:

Clause (3)

For obtaining a bachelor's degree in engineering the studying duration is five years, each year is divided into two semesters, starting with a general preparatory year for all students. Then the specialization for the students begins in the second year according to selected courses shown in the regulations.

10. Regulations for Progression and Program Completion

Following the below clauses:

Clause (9)

The student can transfer to the following academic year with failing subjects if he/she fails in no more than two courses from the previous year. Student is enrolled in the courses of a lower level in addition to at most two additional courses from the group of university required courses. The exam for these failed courses is to be taken with the students of the academic year according to the regular schedule. If the student manages to succeed in the courses he/she will not be graded higher than a "pass" grade with a maximum of 64%.

For the two-part courses, student is considered to succeed the course if he passed the two parts constituting the course. However, if a student fails the course, the exam can be retaken in the part he failed in with the students that part is originally taught. If the student manages to succeed he will not be graded higher than a "pass" grade with a maximum of 64%. This grade is added to the previous part he passed. The student will be graded "fail" if he/she did not pass one or both parts, and if a student failed both parts and then passed them, he will be graded in both of them with the highest grade in the "pass" grade (64%).

Clause (10)

Success in all courses is a must before obtaining a bachelor's degree. For students in the fourth year who have failed in no more than two of their curriculum courses and with two additional university requirement courses at most. A second-round exam is held during October in the new academic year, and the student must pass all the failing courses in this exam. Otherwise, the student remains for repetition and must retake the courses which he failed to pass. Also, the grade will not exceed the "pass" grade with a maximum of 64%, and there is no repetition exam for the graduation project.

Clause (11)

If the exam for one of the courses includes a written exam and another oral or practical part, the student's grade in this course is estimated from the total of the written, oral or practical exams in addition to the work of the term. A student who is absent in the written exam is considered failed in the course. If one of the courses does not include a written exam (such as the graduation project), the practical or oral exams are treated as the written exam.

Clause (12)

A- The student will be assessed in the exams each academic year, and the total grade will be according to one of the following:

Excellent:	85% or more of the total score
Very good:	from 75% to less than 85% of the total score
Good:	from 65% to 75% of the total score
Pass:	from 50% to less than 65% of the total score

The student's failure is estimated by one of the following two grades:

Poor:	from 30% to less than 50% of the total score
Very poor:	less than 30% of the total score

- B- The student's success grade in the courses he has previously failed in is a "pass" grade with a maximum of 64%.
- C- The total grade of students in the Bachelor's degree is calculated on the basis of the total grades (cumulative) achieved in all academic years, and the students are ranked according to this total grade.
- D- The student is granted honors if his final grade is excellent or at least very good, and his annual grade is not less than very good in any of the academic years except for the preparatory year, and he must not fail any exam in any of the academic years except for the preparatory one.

11. Teaching and Learning Methods:

Teaching & Learning Methods
Lecture
Tutorials
Computer-based Instruction
Design Studio
Problem-based Learning
Project-based Learning
Interactive Learning
Presentations
Case Study
Report
Co-operative Learning
Brain Storming
Projects
Simulation
Discussion
Practical-based Learning
Self-Learning
Modeling

12. Student Assessment (Methods and rules for student assessment):

Assessment Method	
Tests	Oral Test
	Mid Term Exam
	Quizzes
Reports	
Observation	
Discussions	
Projects	Projects
	Mini Projects
Assignments	
Presentations	
Modeling	
Portfolio	
Final Exam	

13. Program Evaluation

Evaluator	Tool	Sample
Senior Students	Questionnaire-meeting	50% of the students
Graduates	Questionnaire-meeting	25 % of the Graduates
Stakeholders	Questionnaire-meeting	10
Internal Evaluator	Report	6/2023
External Evaluators	Report	7/2023

14. Appendix

14.1. Program Mission

Program Mission		Faculty Mission			(NARS 2018) CBE															
		F1	F2	F3	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	
The architecture program at the Faculty of Engineering Benha is committed to preparing an architect who is intellectually and scientifically qualified and has the ability to compete in the labor market and keep pace with scientific and technological development in the field of architecture in a manner that serves and achieves the needs of society within the framework of an ethical approach that allows continuous improvement and preservation of the environment and society.	M1	The architecture program at the Faculty of Engineering Benha is committed to preparing an architect who is intellectually and scientifically qualified and has the ability to compete in the market labor.	*					*			*	*	*			*			*	*
	M2	Keep pace with scientific and technological development in the field of architecture.		*		*	*			*				*	*		*	*	*	
	M3	In a manner that serves and achieves the needs of society within the framework of an ethical approach that allows continuous improvement and preservation of the environment and society.			*				*	*			*	*			*	*	*	

Faculty Mission	Benha Faculty of Engineering - Benha University is committed to graduate well prepared engineers equipped with knowledge and skills necessary to compete in labor market, and capable of using and developing modern technology, and providing research in engineering fields to serve society and community.
F1	Benha Faculty of Engineering - Benha University is committed to graduate well prepared engineers equipped with knowledge and skills necessary to compete in labor market.
F2	Capable of using and developing modern technology.
F3	Providing research in engineering fields to serve society and community.



14.2. Program Objectives

Program Objectives	Program Mission			(NARS 2018) CBE															Graduate Attributes														Requirements			Credit Hours of Subject Area									
	M1	M2	M3	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	University	Faculty	Program	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary			
PO1	*	*		*	*							*							*	*														*		*		*							
PO2	*		*			*										*					*	*	*							*				*		*						*			
PO3	*									*	*	*									*							*				*		*		*					*				
PO4		*					*	*								*					*								*				*		*		*				*				
PO5	*							*			*		*												*	*			*	*		*	*		*	*		*			*				
PO6			*						*		*			*	*		*											*	*		*	*		*	*		*				*				
PO7		*	*			*	*		*					*	*		*											*	*	*		*	*		*	*		*			*				

Program Mission	The architecture program at the Faculty of Engineering Benha is committed to preparing an architect who is intellectually and scientifically qualified and has the ability to compete in the labor market and keep pace with scientific and technological development in the field of architecture in a manner that serves and achieves the needs of society within the framework of an ethical approach that allows continuous improvement and preservation of the environment and society.
M1	The architecture program at the Faculty of Engineering Benha is committed to preparing an architect who is intellectually and scientifically qualified and has the ability to compete in the market labor.
M2	Keep pace with scientific and technological development in the field of architecture.
M3	In a manner that serves and achieves the needs of society within the framework of an ethical approach that allows continuous improvement and preservation of the environment and society.

14.3. Graduate Attributes

Graduate Attributes	Requirements			Credit Hours of Subject Area						
	University	Faculty	Program	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary
G1: Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.		1		1	1		1			
G2: Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.			1				1		1	1
G3: Behave professionally and adhere to engineering ethics and standards.		1		1		1				1
G4: Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.		1				1		1		1
G5: Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community.			1		1	1			1	
G6: Value the importance of the environment, both physical and natural, and work to promote sustainability principles.	1						1		1	
G7: Use techniques, skills and modern engineering tools necessary for engineering practice.		1						1		1
G8: 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.	1			1	1	1				
G9: Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.	1			1		1		1		
G10: Demonstrate leadership qualities, business administration and entrepreneurial skills	1						1	1		
G11: Knowing the laws, legislations and requirements in the field of architecture and urbanism and how to apply them to meet local needs and global developments.			1						1	1
G12: The ability to combine outstanding creative design with technological development to improve the quality of the built environment and meet social, technological, and environmental challenges.			1	1			1		1	
G13: Solve architectural problems with a wide range of complexity and variation throughout applying analytic critical and systemic thinking.			1				1		1	
G14: 14. Demonstrate understanding of cultural, historical and established architectural theories, philosophies and context.			1	1						1

14.6. Assessment Methods VS Teaching & Learning Methods

Assessment Methods		Teaching and Learning Methods																	
		Lecture	Tutorials	Computer-based Instruction	Design Studio	Problem-based Learning	Project-based Learning	Interactive Learning	Presentations	Case Study	Report	Co-operative Learning	Brain Storming	Projects	Simulation	Discussion	Practical-based Learning	Self Learning	Modeling
Formative Assessment	Tests	Oral Test					*		*	*	*			*		*	*	*	
		Mid- term	*	*															
		Experimental			*												*		
		Quizzes	*	*															
	Reports							*		*					*		*		
	Observation					*		*			*	*							
	Discussions	*	*		*	*	*		*	*	*		*	*	*	*		*	
	Projects	Projects				*	*		*	*	*	*		*	*	*	*	*	*
		Mini Projects				*	*		*	*		*		*	*	*	*		*
	Assignments		*	*	*	*													
Presentations						*		*	*	*			*						
Summative Assessment	Final Exam	*	*																