Department of Architectural Engineering



Architectural Engineering BSc. Program



Program Specification

A-Basic Information

		Pro	ogram Title			
	Archite	ectu	ıral Engir	neei	ring	
Program Type		Singl	e	Cat	egory	Undergraduate
Dept. Offering the Program	Architectu De	ıral E partn	ngineering 1ent	S	ystem	Credit Hours
Units Required for Graduation	20	09 un	its	Aw D	varded egree	BSc. In Architecture
	Preparato Year (Leve	ory el 0)	44 Units	N I	lo. of Level	5 Levels
Program Stages	Diploma (Level 1-2	ı 2)	81.5 Units	N Ser	lo. of nesters	15 Semesters
	Bachelon (Level 2	r 3)	83.5 Units	Aca	ademic Year	2022/2023
Program Coordinator			Dr. Hisham	Ali A	boelwafa	a
External Evaluator (s)		Р	rof. Dr. Isma	il Ah	med Am	er
Internal Evaluator(s)		Pr	of. Dr. Ashra	f Ab	o El-Oyo	oun
The most recent	approval		Dept. council	l		5/9/2021
Date of program s	pecification	A	cademic coun	cil	No.	(46) 19/9/2022

B- Specific Information

1- Program Vision and Mission

The program's vision and mission are both originate from the vision and mission of El-Minya high institute for engineering and technology.

The Vision	The Mission
The program seeks to graduate an Architect, well	The program commits to prepare a graduate in
qualified and able to compele professionally in	accordance with the National Academic Reference
design and planning to serve national projects and	Standards for Architect engineering, distinguished
community.	and qualified to carry research and serve
	community and country .

2- Program Aims

Upon successful completion of program, the graduate should be able to:

a) Apply knowledge of mathematics, geometry, physics, and engineering concepts to the solution of engineering problems.

b) Design a construction, or a system and/or conduct experiments within realistic constraints to collect, interpret data and analyse performance

c) Identify, formulate and seek the appropriate solution for engineering problems.

d) Consider the impacts of engineering solutions on society & environment.

e) Determine the impact of buildings on the community characters and identity by demonstrating good knowledge of cultural, diversity and differences between communities.

f) Demonstrate knowledge of contemporary engineering issues and engage in self-learning life- long.

g) Use the scientific techniques, personal skills, and engineering different tools, necessary for engineering practice and project management.

h) Work and communicate effectively within multi-disciplinary teams.

i) Act in professional ethics, seriously take the responsibilities; and display a contextual understanding.

j) Identify, formulate and seek the appropriate solution for engineering problems.

k) Apply knowledge practice self, lifelong and other learning strategies.

l) Employ high creativity skills and master technical architectural tools in designing robust architectural projects.

m) Consider the community needs related to urban issues and planning with addressing them in design work

3- Academic Standards

The program adopts the National Academic Reference Standards, NARS 2018 for engineering in general and Architectural Engineering in specific approved by the department council in 21/10/2020 and the institute academic council No. (23) in 24/10/2020

3-1 NARS Graduate Attributes with Program Aims

		Graduates Attributes	Program Aims
		 Upon successful completion of program, the graduate should 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. 	Upon successful completion of program, the graduate should be able to:a) Apply knowledge of mathematics, geometry, physics, and engineering concepts to the solution of engineering problems.
		2) Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.	b) Design a construction, or a system and/or conduct experiments within realistic constraints to collect, interpret data and analyse performance
		3) Behave professionally and adhere to	c) Identify, formulate and seek the appropriate solution for engineering problems.
		engineering ethics and standards.	d) Consider the impacts of engineering solutions on society & environment.e) Determine the impact of buildings on the
NARs 2018	ering	4) Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.	community characters and identity by demonstrating good knowledge of cultural, diversity and differences between communities.
	Engine	5) Recognize his/her role in promoting the engineering field and contribute to the development of the profession and the community.	f) Demonstrate knowledge of contemporary engineering issues and engage in self- learning life- long.
		6) Value the importance of the environment, both physical and natural, and work to promote sustainability principles.	g) Use the scientific techniques, personal skills, and engineering different tools, necessary for engineering practice and project management.
		7) Use techniques, skills, and modern engineering tools necessary for engineering practice.	h) Work and communicate effectively within multi-disciplinary teams.
		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.	i) Act in professional ethics, seriously take the responsibilities; and display a contextual understanding.
		9) Communicate effectively using different modes, tools, and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.	j) Identify, formulate and seek the appropriate solution for engineering problems.
		10) Demonstrate leadership qualities, business administration and entrepreneurial skills.	k) Apply knowledge practice self, lifelong and other learning strategies.

	1) Apply general and specialized knowledge and	1) Employ high creativity skills and master
	theories in all fields of architecture.	technical architectural tools in designing
	2) Using critical thinking to solve problems by	robust architectural projects.
	traditional or non-traditional methods in the field of architecture, taking into account all	m) Consider the community needs related to
	variables.	urban issues and planning with addressing
	3) Mastering an expanded set of specialized	Pl) Demonstrate the ability of adopting
	skills in the field of architecture.	investigative manner and visualize /
	4) Critical evaluation of the works and the results	conceptualize skills in their work with giving
	of the work tasks performed to build technical	attention to small details.
	expertise.	Pm) Adopt a holistic problem-solving
re	5) Using modern digital means to deal with	approach for complex, amonguous, and open-
setu	innovative manner	ended chanenges and scenarios.
nite	6) Demonstrate distinction in architectural	Pn) Recognize the new role of architectural
rcł	solutions to problems specific to the field of	engineer as the leader of design projects who
A	work.	has the ability to understand, assemble, and
	 7) Take responsibility for himself and the team. 8) Optimizing the exploitation and development 	coordinate all of the disciplines to create a
	of the workplace resources	sustainable environment.
	9) Familiarity with the levels of responsibility.	
	technical leadership, and project management.	
	10) Apply business ethics in all business	Po) Apply knowledge Prepare design project
	assignments.	and documents who has the ability to
	11) Implementation of standards of quality	understand the context of the architect in the
	assurance and occupational safety in all	construction industry, including the
	procedures related to architecture.	architect's role in the processes of bidding,
		building production

3-2 National Academic references Standards (NARS) Upon successful completion of program, the graduate should be able to: E1) Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics E2) 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 E3) 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 Engineering appropriate to the discipline and within the principles and contexts of sustainable design and development. E4) Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles E5) Practice research techniques and methods of investigation as an inherent part of learning. E6) Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements. E7) Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams. E8) Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools. E9) Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations. E10) Acquire and apply new knowledge, and practice self, lifelong and other learning strategies. M1) 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 M2) 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 Architecture buildings and the spaces between them to human needs and scale. M3) Generate ecologically responsible, environmental conservation and rehabilitation designs; through understanding of structural design, construction, technology, and engineering problems associated with building designs. M4) 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. M5) 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

4 Program Attributes Matrix in Relation to Courses for Every Stage and Level:

Stage: Preparatory Year

Level: 0

				•																			-
Store	Core -	Levels /	Course	Course Title						Er	ginee	ering							Arc	hitec	ture		No. of Competence
Stage	Courses	Courses	Code	Course The	A-01	A-02	A-03	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B 3	B4	B5	Satisfied by Course
			CHM 001	Industrial Chemistry				X															1
y Year			ENG 005	Production Technology (A)				X		X													
			ENG 021	Mechanics (1)				X															1
			MTH 001	Mathematics (A)				x															1
			PHY 001	Physics (A)				X															1
			CS 001	Introduction to Computer Science				X															1
			LNG 001	English Language (A)											X								1
			PHE 001	Physical Education (A)	X																		1
			ENG 011	Technology Concepts									X										1
ry Year			ENG 009	Production Technology Workshop (A)						X			x										2
	Irse	ero	ENG 003	Engineering Drawing (A)					x	x													2
ator	Cou	el Z	СНМ 002	Chemistry Laboratory					x														1
para	ore	Lev	ENG 022	Mechanics (2)				X		X													2
Prej	U U		MTH 002	Mathematics (B)				X															1
			PHY 002	Physics (B)				x															1
			CS 002	Computer Programming (A)					X														1
			HUM 001	Culture Heritage			x									-							1
			LNG 002	English Language (B)											x								1
			PHE 002	Physical Education (B)	x																		1
			ENG 004	Engineering Drawing (B)					X	X													2
			ENG 006	Production Technology (B)				x		x													2
			ENG 010	Production Technology Workshop (B)						x			x										2
			ITR 001	Industrial Training (preparatory)					x				x	x									3

			St	age: D	oiploma Stage						Lev	el:	1 + 2	2										
				MTH 101	Mathematics (C)				X															1
	ĺ			ARE 100	Fundamentals of Architectural Design						X	x	x				X	x	х					6
	ĺ	ng		ARE 101	Theories of Design							x	x						х	х				4
	ĺ	ini		ARE 102	Theory of Structures (1)				X	X				-		-					X			3
	ĺ	rai		ARE 103	History of Architecture								X						X					2
	ĺ	L I		ARE 105	Theories of Architecture							x	x						х	х				4
	ĺ	ria		ARE 110	Elements of								x				X	x	х					4
	ſ	lust	rch	ARE 112	Climate and Desert						X	x									x			3
		Ind	(A	ARE 116	Materials and its Properties				x	x											x			3
		+)ne	ARE 118	Surveying					X		X							X			X		4
	ĺ	sec.		ARE 122	Building Construction						X		x								X		x	4
	ĺ	Ino	eve	ARE 117	Perspective and					X	X	-		-		-				X				3
	ĺ	Ŭ	Γ	ARE 119	Visual Training (A)					X	X							X		X				4
	es	nity		ARE 129	Visual Training (B)					X	X							X		х				4
	ILS	nar		ENG 151	Eng. Economics(1)					X			X											2
	Col	Iun		LNG 101	Eng. Lang. (C)											X								1
	Le	d E		MNG 101	Management Princ.						X	х										Х		3
е	Co	an		PHE 101	Phys. Educ. & Activ. (C)	X																		1
tag		gy		FTR 101	Industrial Training (1)					X	X	X		X	Х	X	X	X				X	X	10
a S		luoi		ARE 104	History and Theories of Urban Planning								x						x					2
om		chn		ARE 106	Architectural Design of Simple Units						x		x				x		x					4
ipl	1	Te		ARE 107	Architectural Design of Complex(1)						x		x				X	x	x	X				6
D		lg,	ch)	ARE 114	Urban Design in New Towns						x	х			х		х		х	х	х	-		7
	ĺ	erir	Ar	ARE 128	Technical Installation for Buildings (A)							x	x	х							х	х		5
		ine	0 (ARE 124	App. of Computers in Architecture (A)					X		x		-		_			х					3
		'ngi	Tw	ARE 126	Building Construction						X		x								x		x	4
		E	vel	ARE 111	Diploma Project						X	X	X				Х	X	X	Х	X			8
	1	asic	Le	ARE 121	Environmental Control					X	x	x								X	X			5
		B		PHE 102	Phys. Educ. & Activ. (D)																			0
	ĺ			PHE 103	Phys. Educ. & Activ. (E)															X				1
				FTR 102	Industrial Training (2)					X	X	x		X	X	X	X	x				X	x	10
		ic		ENG 122	Applied Mechanics				Х															1
		Bas	ОM	MTH 102	Mathematics (D)				х															1
	ļ	י *	d T	MTH 103	Numerical Techniques				Х															1
	ve*	ses . ss *	e an	MTH 104	Mathematical Analysis				Х	Х														2
	ectiv	our	one	HUM 102	Modern Egyptian History			x										x						2
	E	ty C Co	evel	HUM 103	Islamic Civilization (A)			X										X	Х					3
		lani	Jr L	HUM 104	Arabic Literature			X										X						2
		Hum	F	LNG 103	German Language (A)											X		X						2
		H		LNG 104	French Language (A)											X		X						2
	D ¹ -			Ba	sic Courses for a	liplo	ma	stag	e: st	ude	nt sh	ould	l cho	oose	(4)	Unit	s					٦		
	Dipl	oma	stag	e H	umanity courses	for	dipl	oma	stag	ge: s	tude	nt s	houl	d ch	10050	e (2)	Uni	ts						

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			St	tage:]	Bachelor Stage						Le	vel:	3 +	4										
		lg		ME 142	Operations Researchs				X	X		X												3
		nir	ĺ	MTH 105	Statistical Teechnologies				X															1
		rai	ĺ	ARE 202	Theory of Structures (B)				X	X									X		Х			4
		Ε	ĺ	ARE 203	Architectural Design (A)						X						Х		Х	Х				4
		ria	(h)	ARE 204	Town Planning (A)						X			X					X	X		X		5
		ust	Arc	ARE 205	Theory of Architecture (B)							X	X						X					3
		ıpu	e (ARE 206	Architectural Design (B)				-		Х						X		X	Х				4
		I +	nre	ARE 212	Reinforced Concrete				X		X								X		X			4
		es	E	ARE 214	Town Planning (B)						X			X					X	X		Х		5
		urs	vel	ARE 222	Steel Construction				X		X								X		X			4
		Col	Le	ARE 224	App. of Computers in Architecture (B)					X		X					X		X	X	X			6
	5	ty (LNG 201	Eng. Lang. (D)											X								1
	rse	ani		PHE 201	Phys. Educ. & Act. (1)	X																		1
	Ino	im:		PHE 202	Phys. Educ. & Act. (2)	X																		1
	Ŭ	Ηu		FTI 201	Industrial Training (3)					X	X	X		X	X	X	X	X				X	X	10
	ore	nd		DDP 100	Desert Environment				X										X					2
	C	y a		ARE 207	Architectural Design of Complex(2)						X						X		X	X	Х	х	X	7
		nlg		ARE 208	Soil Mechanics and Foundation				X		X										X			3
		0U	(ų	ARE 217	Environmental Design							X							X	X	X			4
പ		ech	Arc	ARE 218	Technical Installation for Buildings (B)							X		X					x	x				4
ag		5, T	nr (ARE 219	Execution Design						X						X		X	X	X	X	X	7
S		ing	Fot	ARE 220	Execution Design and		x				x			X			x			x	x	х	x	8
S.C		Ieel	vel]	ARE 211	B.S.C. Project						X	X					X		X	X	X	X	X	8
B		ıgir	Lev	HUM 201	Egyptian History			X																1
		Er		MNG 201	Projects Management						х	X							X			х	X	5
		sic,	ĺ	PHE 203	Phys. Educ. & Act. (3)	X																		1
		Ba		FTI 202	Industrial Training (4)					X	x	X		X	X	x	X	X				x	X	10
ſ		*		ARE 221	Solar Architecture						X	X							X	X				4
		Irse		ARE 223	Passive Heating and						х	х							X	х	х			5
		C01		ARE 225	Architectural Design					X		X							X	X	X	x	x	7
		nlgy		ARE 226	Modern Technology &						x	X							X	X	X			5
		iout	our	ARE 230	spicial topics						X	X							X		X			4
	es*	Fec	d F	DDP 110	Uses of solar energy							X							X	X	X			4
	sın	*	e ar	HUM 202	English Literature											X								1
	e Co	ses:	hre	HUM 203	Commercial Law		X																X	2
	ctive	Cour	el T	HUM 204	Industrial Psychology			Х																1
	Elec	sic (Lev	HUM 205	Islamic Civilization (B)			Х											X					2
		l Ba	or	HUM 206	Islamic Studies			Х											X					2
		and		LNG 203	German Language (B)											X		X						2
		nity		LNG 204	French Language (B)											X		X						2
		amu		MNG 221	Engineering Economics 2				X		x	x											x	4
		Ηı		MNG 222	Behavior Discipline						x	X												2

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B.S.C Stage

Technology Courses for B.S.C Stage :student should choose (8) units Humanity courses for B.S.C Stage : student should choose (2) Units

5 Program competences with adopted Teaching and Learning Methods :

Attril	butes	Lectures	Tutorials and studio workshops	Open Discussion	Computer lab	projects	Report writing	Site visits – field survey	Case study	Office meeting
	A1	1	1			✓	~		✓	
	A2	1	1		1	✓				
	A3	1	1	1			~			
	A4	1	1	1		1	~	~		✓
	A5	1	1	1		1	~	~	✓	\checkmark
	A6	1	~	~			~		✓	✓
	A7	1	1							
	A8	1	1	1		1	1		1	
	A9	1	1	1			1			1
	A10									
	A01	1		1			1			
	A02	1		1			1			
	A03	1		1			1			
	B1	1	~	~		✓	1	1	1	✓
	B2	1	1	1		1	1			1
	B3	~	~	1			~	1	1	1
	B4	1	1	1			1		1	
	B5	1	1	1		√	1	1	✓	

Con	npetences	Written Exam	Oral Exam	Lab Test	Tutorials	Reports	Quiz	Projects	Oral Presentation
	A1	✓			✓	✓	~		
	A2	~	~	~	~	~	~		\checkmark
Iderstanding	A3	\checkmark			\checkmark	~		~	
ibui	A4		\checkmark					~	\checkmark
erste	A5					~			\checkmark
Inde	A6							\checkmark	
nd C	A7			~				\checkmark	\checkmark
e ar	A8					✓	\checkmark		\checkmark
ledg	A9		✓					~	\checkmark
wou	A10					~		\checkmark	\checkmark
Kr	A-01	~				~	\checkmark		
	A-02	~				~	\checkmark		
	A-03	\checkmark				✓	\checkmark		
lls	B1	✓	✓	✓					✓
l Ski	B2	✓	✓		✓	~	~	~	
ctual	B3		✓				~	~	✓
ellec	B4	✓			✓	✓		~	
Int	B5	✓	✓		✓	✓	~	~	✓

6 Program Competences with adopted Assessment Methods:

6- Program Courses Hours gap analysis in Relation to NARS Subject Areas:

								NAI	RS Subject	Areas		
				le	lit	Α	В	С	D	Е	F	G
Stage	Level	Category	Code	Course Tit	Total Cred Hours	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary Subjects
			CHM 001	Industrial Chemistry	2			2				
			ENG 005	Prod. Tech. (A)	3			3				
			ENG 021	Mechanices (A)	2		2					
			MTH 001	Mathematics (A)	3		3					
			PHY 001	Physics (A)	3		3					
			CS 001	Intro. to Computer	1					1		
			LNG 001	Eng. Lang. (A)	1	1						
			PHE 001	Phys. Educ. & Activ. (A)	0.5	0.5						
		y)	ENG 011	Technical Concepts	1	1						
L		ator	ENG 009	Workshop (A)	1				1			
Yea		and	ENG 003	Eng. Drawing (A)	2			2				
tory	el (0	s (M	CHM 002	Chemistry Laboratory	1				1			
para	Lev	urse	ENG 022	Mechanices (B)	2		2					
Prel		COI	MTH 002	Mathematics (B)	3		3					
		Core	PHY 002	Physics (B)	3		3					
		•	CS 002	Comp. Prog.(A)	2					2		
			HUM 001	Civil Heritage	1	1						
			LNG 002	Eng. Lang. (B)	1	1						
			PHE 002	Phys. Educ. & Activ. (B)	0.5	0.5						
			ENG 004	Eng. Drawing (B)	2			2				
			ENG 006	Prod. Tech. (B)	3			3				
			ENG 010	Workshop (B)	1				1			
			ITR 001	Intro. Indus. Training	5						5	
B	Г	Ses	MTH 101	Mathematics (C)	3		3					
_		ΰĘ	ARE 100	Fundamentals of	4			4				

	_							NAI	RS Subject	Areas		=
				le	it	А	В	С	D	Е	F	G
Stage	Level	Category	Code	Course Tit	Total Cred Hours	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary Subjects
				Architectural Design								
			ARE 101	Theories of Design	2			2				
			ARE 102	Theory of Structures (1)	3		3					
			ARE 103	History of Architecture	2	2						
			ARE 105	Theories of Architecture (1)	3			3				
			ARE 110	Elements of Architectural Design	4			2	2			
			ARE 112	Climate and Desert Architecture	2			2				
			ARE 116	Materials and its Properties	2		2					
			ARE 118	Surveying	2		2					
			ARE 122	Building Construction	2			2				
			ARE 117	Perspective and Sciagraphy	2			2				
			ARE 119	Visual Training (A)	1				1			
			ARE 129	Visual Training (B)	1				1			
			ENG 151	Eng. Economics(1)	1	1						
			LNG 101	Eng. Lang. (C)	1	1						
			MNG 101	Management Princ.	1	1						
			PHE 101	Phys. Educ. & Activ. (C)	0.5	0.5						
			FTR 101	Industrial Training (1)	5						5	
			ARE 104	History and Theories of Urban Planning	3			3				
			ARE 106	Architectural Design of Simple Units	4				4			
			ARE 107	Architectural Design of Complex(1)	4				4			
	rch		ARE 114	Urban Design in New Towns	3				3			
	2) A :		ARE 128	Technical Installation for Buildings (A)	2			2				
	vel (ARE 124	App. of Computers in Architecture (A)	3					3		
	Le		ARE 126	Building Construction and Materials	4				4			
			ARE 111	Diploma Project	3					1	2	
			ARE 121	Environmental Control	2		1	1				
			PHE 102	Phys. Educ. & Activ. (D)	0.5	0.5						
			PHE 103	Phys. Educ. & Activ. (E)	0.5	0.5						

								NAI	RS Subject	Areas		-
				٩	It	Α	В	С	D	Е	F	G
Stage	Level	Category	Code	Course Titl	Total Credi Hours	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary Subjects
			FTR 102	Industrial Training (2)	5						5	
			ENG 122	Applied Mechanics	2							
		for	MTH 102	Mathematics D	3		4					
		es i	MTH 103	Numerical Techniques	3		4					
		ILS	MTH 104	Mathematical Analysis	2							
		Cou	HUM 102	Modern Egyptian History	1	2						
		ive	HUM 103	Islamic Civilization (A)	1							
		eti	HUM 104	Arabic Literature	1	The student selects only						
		Ele	LNG 103	German Language (A)	1	two courses						
			LNG 104	French Language (A)	1							
			MTH 105	Statistical Techniques	2		2					
			ME 142	Operations Researchs	2		2					
			ARE 202	Theory of Structures (B)	3		3					
			ARE 203	Architectural Design (A)	4				3	1		
			ARE 204	Town Planning (A)	3			2	1			
	rch		ARE 205	Theory of Architecture (B)	4			2	2			
	Υ		ARE 206	Architectural Design (B)	4				3	1		
	(3)		ARE 212	Reinforced Concrete	2			2				
	rel	ry)	ARE 214	Town Planning (B)	4				4			
	Jev	ato	ARE 222	Steel Construction	2		1	1				
tage	Ι	and	ARE 224	App. of Computers in Architecture (B)	2					2		
r S		(N	LNG 201	Eng. Lang. (D)	1	1						
elo		es	PHE 201	Phys. Educ. & Act. (1)	0.5	0.5						
ch		urs	PHE 202	Phys. Educ. & Act. (2)	0.5	0.5						
Ba		Co	FTR 201	Industrial Training (3)	5						5	
		re	DDP 100	Desert Environment	3							3
		Co	ARE 207	Architectural Design of Complex(2)	4				4			
	\rch		ARE 208	Soil Mechanics and Foundation	3		2	1				
	I) A		ARE 217	Environmental Design	4							4
	vel (4		ARE 218	Technical Installation for Buildings (B)	3			2	1			
	Lev		ARE 219	Execution Design	3				1	2		
	_		ARE 220	Execution Design and Documents	3				3			
			ARE 211	B.S.C. Project	4		1		1	1	1	

								NAI	RS Subject	Areas		-
				<u>e</u>	it	Α	В	C	D	E	F	G
Stage	Level	Category	Code	Course Tit	Total Cred Hours	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary Subjects
			HUM 201	Egypt History	1	1						
			MNG 201	Projects Management	1	1						
			PHE 203	Phys. Educ. & Act. (3)	0.5	0.5						
			FTR 202	Industrial Training (4)	5					3	2	
			DDP 110	Uses of solar energy	2						<u> </u>	
	 	4	ARE 221	Solar Architecture	2							
		stage	ARE 223	Passive Heating and Cooling	2							6
		lor S	ARE 225	Architectural Design Using Computers	2							The student selects only
		ache	ARE 226	Modern Technology & Desert Architecture	2							three courses
	 	B	ARE 230	Special Topics	2					2		
	 	O r	HUM 202	English Literature	1	<u> </u>						
	 	es f	HUM 203	Commercial Law	1	'						
		ISC	HUM 204	Psychology	1	'						
	1	jou	HUM 205	Islamic Civilization (B)	1	2				ļ		
		C O	HUM 206	Islamic Studies	1	- terdoni				ļ	<u> </u>	
		ive	LNG 203	German Language (B)	1	The studenu selects only				ļ	<u> </u>	
	 	ect	LNG 204	French Language (B)	1	two courses					<u> </u>	
		E	MNG 221	Engineering Economics 2	1							
			MNG 222	Behavior Discipline	1	<u> </u>					<u> </u>	
Total 20				209	20	42	45	45	19	23	15	

Arch. Eng. BSc. Program Specification

Gap Analysis Summery

	Subject Area	Hours	NARS	EXISTING
Α	Humanities and Social Sciences	20	09:12	9.6
В	Mathematics and Basic Sciences	42	20:26	20.1
С	Basic Engineering Sciences	45	20:23	21.5
D	Applied Engineering and Design	45	20:22	21.5
Ε	Computer Applications and ICT	19	09:11	9.1
F	Projects and Practice	23	08:10	11
G	Discretionary Subjects	15	06:08	7.2
	Total	209	100%	100%

7- Program Structure and Contents:

7-a- Program Duration:

The program duration is at least five academic years including 3 semesters per year (Summer semester is optional) with max. total number of 15 semesters. Each semester is 15 weeks long except summer one that can extend to only 8 weeks. The maximum study duration is 8 years. The student who cannot fulfill the graduation requirements during this period could re-apply for the study conditioned on the number of credit hours not exceed (2/3) the graduation required credit hours.

7-b- Program Structure:

The program is based on credit-hours system where the credit hour (Cr-h) is the study measurement unit that equals one lecture hour or two practical / exercise hours in a weak within one semester.

Total (Cr-h) required for graduation	=	209	Cr-h
Core (Mandatory)	=	193	Cr-h
Elective	=	16 C	Cr-h

7-c- Program Stages & Levels:

The program has two stages in addition to the preparatory year (Diploma stage and Bachelor stage). In general, it consists of five levels over its all stages as follow:

Preparatory year= Level (0)= 44 Cr-hDiploma stage= Level (1) + Level (2)= 81.5 Cr-hBachelor stage= Level (3) + Level (4)= 83.5 Cr-h

7-c- Program Registration Rules:

- The student can apply for 20 Cr-h in each first and second semesters of the academic year.
- The student can apply for two courses only with 7 Cr-h or less in the summer semester.

8- Courses Contributing to the Program:

8-1 Preparatory Year:

Level (0)

		Weekly hours					
Code Course Title		Lect.	Exc.	Lab	Total	Total Cr-h	
CHM 001	Industrial Chemistry	2	0	0	2	2	
CHM 002	Chemistry Laboratory	0	0	3	3	1	
ENG 005	Production Technology (A)	2	2	0	4	3	
ENG 021	Mechanics (1)	2	2	0	4	2	
ENG 022	Mechanics (2)	2	2	0	4	2	
MTH 001	Mathematics (A)	2	2	0	4	3	
MTH 002	Mathematics (B)	2	2	0	4	3	
PHY 001	Physics (A)	2	0	3	5	3	
PHY 002	Physics (B)	3	0	2	5	3	
CS 001	Introduction To Computer Science	0	0	2	2	1	
CS 002	Computer Programming(A)	1	0	2	3	2	
ENG 003	English Graphics (A)	1	0	4	5	2	
ENG 004	English Graphics (B)	1	0	4	5	2	
ENG 006	Production Technology (B)	2	2	0	4	3	
ENG 009	Production Technology Workshop (A)	0	0	6	6	1	
ENG 010	Production Technology Workshop (B)	0	0	6	6	1	
ENG 011	Technology Concept	2	0	0	2	1	
HUM 001	Culture Heritage	2	0	0	2	1	
	Total Weekly Hours	26	12	74	112	44	

8-2 Diploma Stage Core Courses (Mandatory):

Level (1)

			Weekly hours					
Code	Course Title	Lect.	Exc.	Lab	Total	Total Cr-h		
MTH 101	Mathematics (C)	2	2	0	4	3		
ARE 100	Fundamentals of Architectural Design	1	6	0	7	4		
ARE 101	Theories of Design	2	1	0	3	2		
ARE 102	Theory of Structures (1)	2	2	0	4	3		
ARE 103	History of Architecture	2	0	0	2	2		
ARE 105	Theories of Architecture (1)	3	0	0	3	3		
ARE 110	110 Elements of Architectural Design		6	0	7	4		
ARE 112	RE 112 Climate and Desert Architecture		1	0	3	2		
ARE 116	116 Materials and its Properties		1	0	3	2		
ARE 118	Surveying	1	0	2	3	2		
ARE 122	Building Construction	1	2	0	3	2		
ARE 117	Perspective and Sciagraphy	1	2	0	3	2		
ARE 119	Visual Training (A)	0	2	0	2	1		
ARE 129	Visual Training (B)	0	2	0	2	1		
ENG 151	Eng. Economics(1)	1	0	0	1	1		
LNG 101	Eng. Lang. (C)	1	1	0	2	1		
MNG 101	NG 101 Management Princ.		0	0	1	1		
PHE 101	Phys. Educ. & Activ. (C)	0	0	1	1	0.5		
FTR 101	Industrial Training (1)	0	0	30	30	5		
	Total Weekly Hours	23	28	33	84	41.5		

8-3 Diploma Stage Core Courses (Mandatory):

Level (2)

		Weekly hours					
Code	Course Title	Lect.	Exc.	Lab	Total	Total Cr-h	
ARE 104	History and Theories of Urban Planning	2	2	0	4	3	
ARE 106	Architectural Design of Simple Units	1	6	0	7	4	
ARE 107	Architectural Design of Complex(1)	1	6	0	7	4	
ARE 114	Urban Design in New Towns	1	4	0	5	3	
ARE 128	28 Technical Installation for Buildings (A)		2	0	3	2	
ARE 124	App. of Computers in Architecture (A)	1	0	4	5	3	
ARE 126	Building Construction and Materials	2	4	0	6	4	
ARE 111	Diploma Project	1	4	0	5	3	
ARE 121	Environmental Control	2	0	0	2	2	
PHE 102	Phys. Educ. & Activ. (D)	0	0	1	1	0.5	
PHE 103	Phys. Educ. & Activ. (E)	0	0	1	1	0.5	
FTR 102	Industrial Training (2)	0	0	30	30	5	
	Total Weekly Hours	12	28	36	76	34	

8-4 Diploma Stage Elective Courses*:

Weekly hours Code Total **Course Title** Lect. Exc. Lab Total Cr-h ENG 122 Applied Mechanics 2 1 0 3 2 MTH 102 Mathematics D 2 2 0 4 3 MTH 103 Numerical Techniques 2 2 0 4 3 MTH 104 Mathematical Analysis 0 3 2 2 1 HUM 102 Modern Egyptian History 1 0 0 1 1 HUM 103 Islamic Civilization (A) 1 0 0 1 1 HUM 104 Arabic Literature 1 0 0 1 1 LNG 103 German Language (A) 1 1 0 2 1 LNG 104 French Language (A) 0 2 1 1 1 **Total Weekly Hours** 13 8 0 21 15

* Note: The student should select any number of courses in diploma stage with maximum 4 units through levels 1&2

8-5 Bachelor Stage Core Courses (Mandatory):

Level (3)

			Weekly hours					
Code	Course Title	Lect.	Exc.	Lab	Total	Total Cr-h		
MTH 105	Statistical Techniques	2	1	0	3	2		
ME 142	Operations Researchs		1	0	3	2		
ARE 202	Theory of Structures (B)	2	2	0	4	3		
ARE 203	Architectural Design (A)	1	0	6	7	4		
ARE 204	Town Planning (A)	2	2	0	4	3		
ARE 205	Theory of Architecture (B)	3	2	0	5	4		
ARE 206	Architectural Design (B)	1	6	0	7	4		
ARE 212	Reinforced Concrete	2	1	0	3	2		
ARE 214	Town Planning (B)	2	4	0	6	4		
ARE 222	Steel Construction	2	1	0	3	2		

Level (1&2)

ARE 224	App. of Computers in Architecture (B)	1	0	2	3	2
LNG 201	Eng. Lang. (D)	1	1	0	2	1
PHE 201	Phys. Educ. & Act. (1)	0	0	1	1	0.5
PHE 202	Phys. Educ. & Act. (2)	0	0	1	1	0.5
FTR 201	Industrial Training (3)	0	0	30	30	5
	21	21	40	82	39	

8-6 Bachelor Stage Core Courses (Mandatory):

Weekly hours Code Total **Course Title** Total Lect. Exc. Lab Cr-h DDP 100 Desert Environment ARE 207 Architectural Design of Complex(2) ARE 208 Soil Mechanics and Foundation ARE 217 Environmental Design ARE 218 Technical Installation for Buildings (B) ARE 219 Execution Design ARE 220 Execution Design and Documents ARE 211 B.S.C. Project HUM 201 Egypt History MNG 201 Projects Management PHE 203 Phys. Educ. & Act. (3) 0.5 FTR 202 Industrial Training (4) 34.5 **Total Weekly Hours**

8-7 Bachelor Stage Elective Courses*:

Level (3&4)

Level (4)

			W	eekly hou	irs	
Code	Course Title	Lect.	Exc.	Lab	Total	Total Cr-h
DDP 110	Uses of solar energy	2	1	0	3	2
ARE 221	Solar Architecture	2	1	0	3	2
ARE 223	Passive Heating and Cooling	2	1	0	3	2
ARE 225	Architectural Design Using Computers	1	0	2	3	2
ARE 226	Modern Technology & Desert Architecture	2	1	0	3	2
ARE 230	Special Topics	1	0	2	3	2
HUM 202	English Literature	1	0	0	1	1
HUM 203	Commercial Law	1	0	0	1	1
HUM 204	Psychology	1	0	0	1	1
HUM 205	Islamic Civilization (B)	1	0	0	1	1
HUM 206	Islamic Studies	1	0	0	1	1
LNG 203	German Language (B)	1	1	0	2	1
LNG 204	French Language (B)	1	1	0	2	1
MNG 221	Engineering Economics 2	1	0	0	1	1
MNG 222	Behavior Discipline	1	0	0	1	1
	Total Weekly Hours			4	29	21

* Note: The student should select any number of courses in bachelor stage with maximum 4 units through levels 3&4

9- Courses Contents:

Code	Course title	Contents
Preparato	ry Year – Level (0)	
MTH 001	Mathematics (1)	Functions, limits of functions, techniques for finding limits, limits involving infinity, continuous functions, the derivative, techniques of differentiation, differentials, the chain rule, implicit differentiation applications of the derivatives, extreme of functions, the mean value theorem, optimization problems, Newton's method, anti-derivative and indefinite integration, the definite integral, the fundamental theorem of calculus.
MTH 002	Mathematics (2)	Applications of the definite integral, area, solids of revolution, arc length and surfaces of revolution, logarithmic and exponential functions and their derivatives, inverse trigonometric and hyperbolic functions and their derivatives and integrals, techniques of integration, integration by parts, trigonometric integrals, integrals of rational functions, reduction formulae, in determined forms and improper integrals.
PHY 001	Physics (1)	Properties of Matter: physical quantities, standard units, dimensions, oscillations. Gravitation. Fluid statics, surface tension, fluid dynamics, viscosity. Elasticity, waves in elastic media, sound waves. Heat: temperature and temperature measurement, thermal expansion, heat transfer, the first law of thermodynamics, kinetic theory of gases, entropy and the second law of thermodynamics. Coulomb's law, the electric field, Gauss law, the electric potential, capacitance and dielectrics, current electricity, electric circuits.
PHY 002	Physics (2)	Electricity and magnetism: charge and matter, the electric field, Gauss law, electric potential, capacitors and dielectrics, current resistance and electromotive forces, the magnetic field, Ampere's law, Biot-Savart law. Maxwell's equations in integral form.
CHM 001	Industrial Chemistry	Kinetic molecular theory of gases, ideal gases. Boyle's law, Charlie's law, Avogadrro's law, ideal gas equation, some useful forms derived from ideal gas equation, Dalton's law, Graham's law and it's practical application, deviation of gases from ideal behavior, real gases, Van Der Waal's equation, liquifaction of gases and Joule-Thomson effect and it's application, Liquid state. Environmental chemistry petroleum
CHM 002	Preparatory Chemistry Lab	Qualitative analysis : identification of a simple salt. Quantitative analysis, volumetric analysis (neutralization, titration, oxidation, reduction, complex formation, precipitation).
CS 001	Introduction To Computer Science,	Computer terminology and concepts. The history, state of the art and future of data processing Basic hardware and software concepts. The computer's effect on society, Operating Systems, DOS as an example.
CS 002	Computer Programming (A)	Structured programming with the high level language PASCAL. The techniques of good programming style and how to design, code, debug, and document program laboratory assignments. Topics progress from basic PASCAL syntax and semantics to sequential non-text files. The control features, data structures, standard I/O libraries and the operators of the language.
ENG 003	Engineering Graphics (A),	Drawing practice, graphics geometry and tangency construction, projection of bodies of simple geometric, pictorial representation and technical sketching, orthographic projection, pictorial drawing and sectioned views.
ENG 004	Engineering Graphics (B)	Types of sectioned views, assembly drawing, familiarity with specifications, reading of blue prints, interpretation of various symbols commonly used, interpretation of material lists and bills of materials
ENG 005	Production Technology (A),	Introduction to production (manufacturing processes), manufacturing elements, properties of engineering materials, classification according to machinability, cast-ability. Principles of cutting and forming properties. Tools and tool geometry, machine tools simplified analysis, forming

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		machines simplified analysis, wood working, timber kinds and properties, Wood working tools and equipment, wood working machines, types of joints technology, finessing and protection processes, safety, costing. Sheet metal working, developing of surfaces. Shearing bending, duct tubes rolling, seam joints, safety, costing, .Bench works, marking sawing, chiseling, filing, etc. Casting of metals, the foundry, foundry sands, molding technology, pattern making, core making, melting in the foundry, pouring different casting processes, felting, cleaning, finishing and inspection. Powder metallurgy, rolling, forging process, wire drawing, extrusion, cupping and deep drawings, spinning, blanking and piercing, enclosing, coining and stamping.
ENG 006	Production Technology (B)	Welding: Joining of metals, mechanical joining, metallurgical joining, fusion welding, oxyacetylene welding and cutting, under water welding and cutting, electric arc welding. Physics of arc, power sources, TIG and MIG, argon welding, coated electrodes classifications, standards, coding systems, CO2 welding, carbon arc welding. Cold welding cladding. Hot pressure welding, forge welding, electric resistance welding, spot and seam welding, flash welding, percussive welding, projection welding, friction welding, diffusion welding, ultrasonic welding. Brazing, soldering, surfacing tests, welding defects, safety, costing. Machining processes: Theory of metal cutting, tool geometry, cutting speeds, feeds, cutting fluids, tool materials, work piece materials and properties, machinability. Machine tools classification, the lathe, description of mechanisms, turning processes, cylindrical, internal, taper, threads. Profile copying, cam turning, NC and CNC machines. Shaping and planing, boring, milling, sawing, broaching, gear cutting, indexing, gear sharpening, hobbling, non-conventional and modern machining processes.
ENG 009	Production Technology Workshop (A)	Practical training on the basic workshops like, machining (lathe, milling, shaping, drilling, and grinding machines). Identification of the main parts of each machine and how to select the cutting variables on each machine performance of simple exercises. Wood working; hand tools, types of wood and machines, filing. Welding; simple joints on arc welding and oxyacetylene welding. Length and angle measurements using micrometer, vernier and protractors. Sheet metal works; Cutting, Rolling, Binding and making joints on sheets. Casting; recognition of the main elements and tools used in casting and how to make a mold using a core and a pattern for a simple casting.
ENG 010	Production Technology Workshop (B)	Machining: Practical training on metal cutting, operations on center lathe, milling m/c, shaper and drilling m/c, gear cutting on milling m/c. hand press and mechanical press of different capacities, shearing (blanking, piercing and deep drawing processes). Welding: Oxyacetylene; different techniques used in oxyacetylene welding, fluxes, welding and cutting torches, prepare and make some joints, safety during welding operations. Arc welding; the main elements, different coatings, welding methods, prepare and make some joints, safety. Resistance welding; main elements, joints of different shapes. Soldering and brazing; the main differences between them and the tools used, joints by soldering.
ENG 011	Technology Concepts	Industry and technology. Engineering materials, standardization and interchange-ability. Material handling and storage. Energy. Pollution and waste disposal. Information systems. Report writing. Selected industries (textiles, garment, plastics, refrigeration, pumps, electric, etc.).
ENG 021	Mechanics (1)	Introduction to engineering mechanics. Vector analysis. Forces on particles and rigid bodies, equilibrium of particles and rigid bodies, forces and moments, applications on beams. Analysis of simple structures, kinematics of particles. displacement, velocity and acceleration using scalar and vectorial methods, kinetics of particles. Newton's law, work and energy, impulse and momentum.

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ENG 022	Mechanics (2)	Dynamics of a Particle: Kinematics of a Particle. Motion of a particle (position, displacement, velocity and acceleration). Coordinate systems (Cartesian, natural, polar and cylindrical). Kinetics of a Particle. Equation of motion. Applications (projectile, simple harmonic motion, motion in resisting medium). Work and. energy. Principle of conservation of energy. Momentum. Impulse. Impact.
HUM 001	Culture Heritage	Definition of Cultural heritage, its source, ups and downs, objectives and motivations. Throwing light on some of the scientific facts brought about by human civilization.
LNG 001	English Language (A)	Cambridge English course, developing reading skills, listening and keep listening. Basic technical English, from current course books and other authentic materials. English grammar in use.
LNG 002	English Language (B)	Headway intermediate course, developing reading skills, authentic reading, writing skills, task listening. Basic technical English interface, English for technical communication Grammar.
PHE 001	Physical Education (A)	General physical education concepts and theoretical topics. Introduction of sports psychology. The effect of movement activities on Organs of the body. Physical gymnastic exercises (1)
PHE 002	Physical Education (B)	Functional anatomy of muscles skeletal system, biomechanics of connective tissue, functional aspects of muscle and a discussion of mechanics and energetic. Factors that contribute to sport injuries, principles of prevention and car, first aid management, the treatment of injuries, rehabilitation techniques in sports medicine and safe practice and the low.
ITR 001	Industrial Training (A)	The student learns to identify the various production units and the way they inter-connect in the production process. The student is also trained to operate the various pieces of machinery in order to recognize his technical inclinations as a prelude to his selection of a specification within the institute. The student is also trained to identify the raw materials, as well as the handling, processing and machining of materials to obtain intermediate and final products. The duration of this industrial training is thirty hours per week spread over a minimum of five days for one academic term.
Dipioma S	stage Core Courses ((Viandatory)– Level (1)
ARE 100	Fundamentals Of Architectural Design	Study of architectural programs and development of design for simple buildings and different uses such as: dwellings, services, cultural and recreational buildings. The course envisages the emphasis on the study of various spaces in architectural design.
ARE 101	Theories Of Design	Types and principles of design of public building, profitable building: Residential, commercial (offices and commercial centers) and recreational. Non-profitable buildings: educational, cultural, medical, sport facilities, public services and religious.
ARE 102	Theory Of Structures	Reactions internal actions in statically determinate beams and cantilever beam, internal actions in statically determinate frames and statically determinate trusses. Properties of plane areas, members under axial forces, normal stresses, shear stresses and combined stresses
ARE 103	History Of Architecture	Prehistoric, Egyptian, Greek and Roman Architecture. Early Christian Architecture. Byzantine Architecture. Islamic Architecture.
ARE 105	Theories Of Architecture (1)	Theories of architecture: roots of contemporary architecture Revivalism: romantic, classicism, revolutionary architects in France, development in France, England, U.S.A, and Germany. Gothic Revival: England, Germany & U.S.A. Picturesque, Renaissance, revival, Eclecticism, Philosophy, 2nd Empire France, U.S.A. Higher Victorian. Structural logic: development of iron and reinforced concrete, writing of violet le Due and Chicago school. Functional logic: biological analogy, Wright, Mechanical Analogy, Le Corbusier and Bauhaus School. Formal development: Effect of Art, Cubicm, Purism, De Stjill and Picturesque Tendencies.

ARE 110	Elements Of Architectural Design	Functional logic: manipulation of human environment, functional elements, public, private, service elements, circulation elements, horizontal and vertical. Structural logic: development, material and geometric continuity, linear elements and surface elements.		
ARE 112	Climate And Desert Architecture	Man and environment, desert, sun, heat, heat transfer, wind, wind control, pollution, humidity, natural lighting and comfort zone. Desert architectural design-		
ARE 116	Materials And Its Properties	Engineering materials: classification, sources of raw materials, selection properties, testing and inspection, specification, standardization and standard specification. Concrete ingredients: aggregates, general classification, properties, requirements and testing. Ferrous and non Ferrous metals: types properties, alloys scope of use and effect of heat treatment on mechanical properties. Lab tests to study the behavior of engineering materials under static loads.		
ARE 117	Perspective And Sciagraphy	A study of shades and shadows of point, line, circle, and mass (cylinder, sphere) and their architectural applications. A study of picture planes: the vanishing point, parallel or one vanishing point perspective, two vanishing point perspectives, the cone of vision, the inverse perspective, and shades and shadows in perspective.		
ARE 118	Surveying	Plane and geodetic surveying, triangulation points kinds of maps, longitudinal and diagonal scales and enlarging maps. Pantograph and Areas.		
ARE 119	Visual Training (A)	Pencil points and line techniques, proportions and blocking in proportions, values and value scale, different planes, foreground, middle ground and background, depth, representation of buildings, building details and interiors, study of nature and tree representation, study of factors leading to the artistic success of sketches, sketching objects; and different architectural elements and nature. This is either in or out the studio by means of the pencil, charcoal, pen and ink, for the cause of training student's eyes and hands, and to let him achieve good proportions and beauty.F		
Diploma S	Stage Core Courses (Mandatory)– Level (2)		
Dipiona		A Study for the where and site conclusion through history (starting from		
ARE 104	History And Theory Of Urban Planning	ancient Egypt, Mesopotamia, Greek, Roman, Middle ages, Renaissance). The industrial revolution and its effect on the pattern of the city. Trends and theory of city planning.		
ARE 106	Architectural Design Of Simple Units	Analysis, studies and design of simple building elements with site planning. Constructional expression in architecture. PREREQUISITE: ARE 101, ARE 110 & ARE 129concrete (flat roofs) and exterior and interior stairways.		
ARE 107	Architectural Design Of Complex Units	Analysis, study; and design of complex buildings and sketch design with special characters.		
ARE 114	Architectural Design In New Towns	The course introduces three main aspects of urban design: the types of urban spaces (city, paths, public spaces, special projects); the lvels of perception of urban spaces (user, analyzer, critic and designer perceptions); the elements of analyzing or designing the urban spaces (components, activities, forms, materials, colors, characteristics, style). PREREQUISITE: ARE 112		
ARE 128	Technical Installation For Building (A)	Sanitary engineering, plumbing and building equipment sanitation. Public WW vital statistics - communicable disease control, public health education. Sewage disposal in general water supply public and private intakes and coagulation. Sedimentation and clarifies, filtration, chlorinating, disinfecting, storing and distribution, plumbing objects, plumbing system, plumbing fixtures the distribution system, the main and branches, connections and materials piping and house drain. Building equipment: lifts, escalators, kitchens and laundries.		
ARE124	Computers In Architecture (A)	architectural design and the graphic arts. Practical assignments are also included.		

ARE 126	Applications Of Computers In Architecture (A)	Concrete: mixing water - admixtures, types of mix design, properties of sketch, green and hardened concrete, special types, quality control, influencing factors and effect of varying mix proportions. Ready units, plastics and glass, properties physical and mechanical tests. Isolating inspection of engineering materials, analysis and presentation of data steps of building construction and methods.	
ARE 111	Diploma Project	The student selects one of the available projects in the department with the help of academic staff. The fulfillment of the project should prove that the student has enough experience in modeling and Architectural Design.	
ARE 121	Environmental Control Sun: Geographical relations between sun and earth; and methods or knowing sun angles in different points on earth different days and h the year. Architectural control of sun rays on buildings. Air: Study movements of wind; and architectural control of air movements in between buildings		
PHE 102	Physical Education And Activities (D)	Introduction to music, The main features include :.theoretical orientation, musical instruments, musical note, playing music, training on solo and choir singing.	
PHE 103	Physical Education And Activities (E)	Introduction to knitting : a brief study of knitting machines, kinds of strings, training on various types of hand made stitches, computerized knitting, basics of knitting machine maintenance.	
FTR 102	Field Training (2)	The student shall be trained on how to execute reinforced concrete buildings; concrete mix design on site; the use of different mixing methods, such as manual, mechanical and the manner to employ the central mix station technique. Also the student shall be trained to prepare the shuttering for different concrete elements	
Diploma Stage Elective Courses – Level (1&2)			
ENG 151			
LNG 101	English (C)	Headway upper intermediate, developing ready authentic materials, ideas for a story. English for communication. Grammar.	
MNG 101			
PHE 101	Physical Education And Activities (C)General culture topic may be selected from the following areas: comparative study of liberal and socialist systems party systems, and role in democratic societies the role of the media in forming public opinion reports on field trips to social societies museums, news media writing brochures, leaflets, TV and press interviews.		
FTR 101	Field Training (1)	Training shall concentrate on brick work, using different types of blocks and different techniques. The student shall try to apply such techniques manually if possible. The student shall be trained to use the surveying equipment, which he studied at the institute, to prepare and plan the site	
ENG 122			
MTH 103	Numerical Methods	Types of errors, algorithms and convergence, solutions of equations in one variable, interpolation and polynomial approximation, divided differences, central differences, inverse interpolation, numerical differentiation and integration, composite integration, Romberg integration, numerical solution of ordinary differential equations, initial value problems, Euler's method, Runge - Kutta methods, multi step methods.	
MTH 104	Mathematical Analysis	Complex numbers, regions in the complex plane, limits, continuity, derivative, analytic functions, Cauchy - Riemann conditions, elementary functions dud mapping by them definite integral, line integrals in the complex plane, Cauchy's theorem, Cauchy's integral theorem, derivatives of analytic functions, power series, Taylor series, Laurent series, poles, singularities, residue theorem evaluation of real integrals, conformal mapping	
HUM 102	Modern Egyptian History	Particular attention is given to important events determining the life of the Egyptian in the twentieth century. The appearance development and growth of Egyptian middle class and its role in the national movement.	
HUM 103	Islamic Civilization	Difference between culture and civilization, Ibn Khaldun's concept of	

	(I)	civilization, the foundation of Islamic civilization. The decline of Islamic	
HUM 104	Arabic Literature	civilization. Introduction to Arabic literature, students are introduced to various Arabic literature forms selected readings from representative contemporary literary figures.	
Bachelor	Bachelor Stage Core Courses (Mandatory)– Level (3)		
ARE 202	Theory Of Structures (B)	Elastic deformation of statistically determinate structure. Method of continuous beam, method of virtual work, statistically indeterminate beams and frames (without side sway). Consistent deformation method, equation of 3- moments, moment distribution method, live loads on continuous beams and internal normal stresses. Oblique bending, eccentric compression or tension and buckling of columns.	
ARE 203	Architectural Design (A)	Design of architectural compounds made up of several units (study of functional and formal relationships). Special importance is attached to function and formal of spaces left between units. The course also includes development of structural sense through models trails of special type of advanced structure, which followed by applications in creating an architectural space for an appropriate function.	
ARE 204	Town Planning (A)	A general definition for physical planning at different levels. A complete comprehensive planning study (goals, objectives stages and tools of study). The study covers planning criteria, programming and stages of implementation, principles of land uses, neighborhood, housing problems, slum clearance and replanting of slum area, study of housing problems and its solution, house prototypes; factors and planning methodology influencing housing areas; and combined housing and planning project.	
ARE 205	Theory Of Architecture (B)	Principles and directions of contemporary architecture: pre- international architecture, international style - expressionism architecture between two world wars, technical advances of the fifties and architecture of sixties.	
ARE 206	Architectural Design (B)Design of a housing project , including the design of residential units related community facilities Emphasis will be on local environment conditions		
ARE 212	Reinforced Concrete	Properties of reinforced concrete as a building material and factors affecting concrete strength, design of R. C, sections subject to simple, beams loads and loads distribution, design of R. C, slabs: one and two way slabs (crash off, Marcus and Egyptian solutions), hollow block, paneled beams and flat slabs details.	
ARE 214	Reinforced Concrete	Properties of reinforced concrete as a building material and factors affecting concrete strength, design of R. C, sections subject to simple, beams loads and loads distribution, design of R. C, slabs: one and two way slabs (crash off, Marcus and Egyptian solutions), hollow block, paneled beams and flat slabs details.	
ARE 222	Steel Constructions	Properties of steel, specifications, loads, allowable stresses, members subject to centric and eccentric tension or compression, roof trusses, riveted connections, bracing, columns and their bases, beams frames consisting of colulnns and rood trusses, frames, extending over several halls, brackets, cranes and welding welded connections.	
ARE 224	Applications Of Computers In Architecture (B)	Main thrust is enhancement of human / machine communication at computer graphics interface. Formulation of individual projects.	
FTR 201	Field Training (3)	The student shall be trained to control the work and manage its different stages on site with the following : Communicate with different types of workers; Reviewing quantities, prices and quality control; Training to read drawings and apply it on site, Planning and management of the site to guarantee to finish all works on time.	
Bachelor	Stage Core Courses (Mandatory)– Level (4)	
DDP 100	Desert Environment	To equip the student with an understanding of the basic characteristics of the desert environment. Theories of desert	

		formation. Desert climate and [meteorology, geological and hydra-
		geological resources of the desert. Bedouins and desert environment,
		ecology, Eco-system; and brief on descent resources and desert
		Data gathering and analysis of different programs for building of complex
ARE 207	Architectural Design	nature or groups of buildings. Development of the architectural design of
	Of Complex Building	these buildings taking into consideration: space and visual aspects. This
		course is carried out with a special emphasis on modeling.
		Physical properties of soil and soil testing: formation of the soil, physical
ARE 208	Soli Mechanics And Foundations	consolidation: choice of the type of foundations. Design of the shallow
	I oundations	foundations: isolated footings, combined footings and strap footings.
		Urban Design: objectives, components and dimensions, perception of the
	Environmental	urban environments, the visual form at the city scale, major principles of
ARE 217	Design	urban design, analysis and design of spaces; and space systems and
		analysis. Earth work computations: movement system details and projects
		Illumination: Eye and vision, light characteristics and measurements, light
		sources, introduction to lighting design and Acoustics: the characteristics,
ARE 218	Technical Installation	absorption and distribution of sound absorbent building materials,
	For Buildings (B)	insulation of sound, hints to acoustic design. Air conditioning:
		of heat transfer duct design, heating and cooling Cycles.
	Execution Design	Detailed studies of wide-span and span structures, cladding and facing for
		skeleton structures, design and application of metal section for openings
ADE 210		and partitions, derailed studies of stair cases with different desgins and
ARE 219		materials, preparations of working drawings completely detailed and ready for execution including architectural drawings, details, structural
		sections, plumbing and sanitary drawings. Electrical drawing.
		miscellaneous drawings (I.e. elevators, etc.)
ARE 220	Execution Documents	The preparation of a complete set of execution design of a given project
	And Specifications	containing a large span element designed by the student.
	B.Sc. Project	Architectural research: Independent investigation by the student on the
ARE 211		final project Such as (data gathering , analyzing ,, etc.)
		Architectural design: Application of the research and development of the
		architectural design of the final project.
		The student shall be trained to execute the following : Prepare design
FTR 202	Field Training (4)	used on site: Prepare all notes related to the works to guarantee the
		execution of all works according to project specifications.
Bachelor	Stage Elective Cours	es – Level (3&4)
Definition of statistics fraggeney tables and histograms sumulative		
	Statistical Methods	frequency, basic statistical concepts, probability, conditional
		probability and independence, rules of probability, random variables
MTH 105		and their expected values, discrete probability distributions,
		continuous probability distributions, bivariate and marginal probability distribution expected values of functions of random
		variables.
ME 142		
LNG 201	English (D)	Language power, discovering discourse, writing academic English, Technical English.
	Physical Education And Activities (1)	Introduction to Plastic Arts : Appreciation of the artistic aspects of natural
PHE 201		elements, studying the artistic effect of light and shadow, arts workshop
		woodwork practice, making simple original color designs on glass
		material, metal and leather artistic creation.
PHE 202	Physical Education And Activities (2)	vocal training and oral performance character representation dealing with
		the audience study of different dramatic forms, play acting .

		The development of the social, political and economic systems. The rise
HUM 201	History Of Egypt	and development of the national movement and its role in achieving
M		independence and democracy.
Ming 201		Photography : History of Photography from 1826 up to the present time
	Physical Education	theoretical aspects of photography types of cameras : Polaroid, automatic,
PHE 203	And Activities (3)	single reflex (SLR) etc. photography in practice taking photo picture,
		developing, printing, making homemade line films, using video.
	Solar Energy	Solar Energy Conversion Technology: Storage systems, collection of solar
DDP 110	Utilization	energy, solar cooling, solar space heating, and solar water heaters.
		Applications and economic analysis.
		solar movement, solar reclamation, fundamentals of solar heating and cooling active solar design for space heating cooling and domestic hot
ARE 221	Solar Architecture	water, passive solar design for space heating and cooling, performance:
		and economic analysis and the integration of solar concepts into building
		design.
		Characteristics of solar radiation, transparent surfaces and glasses,
ARE 223	Passive Heating And	characteristics of building materials, effect of wind directions, passive
	Cooling	designs, thermal storage walls, thermal storage roots, direct gain and
		Over view of the techniques of computer image synthesis, including both
ARE 225	Architectural Design	the hardware and software, line drawing and color raster graphics
	Using Computers	homogeneous coordinates, hidden surface and smooth shading algorithms.
	Modern Technology	This Course is designed to give the students the properties and
ARE 226	And Desert	characteristics of new building materials suitable for desert architecture. It
	Architecture	also gives the students the applications of new technology in desert
		An introduction to the history methods and the major theories concepts
		of industrial psychology. The course provides non-majors with an
HUM 204	Industrial Psychology	overview of the field of industrial psychology, while majors gain a
		foundation for further study.
	Islamic Civilization	Intellectual aspect of Islam prominent Arab and Muslim scholars and their
HUM 205	(Ii)	contribution to various scientific feed mathematics, astronomy, chemistry,
		Introduction to the forms of literature short story noval drame and
HUM 202	English Literature	poetry Developing students' critical ability through carefully selected
		sample literary texts.
	Engineering	Costing and costing systems, depreciation methods, breakeven analysis,
MNG 221	Engineering Economy (Ii)	replacement analysis, decision making under certainty, decision making
		under risk, evaluation of public projects.
MNC 222	Pahavian Dissinling	A study of organization theories, concepts and structures, individual and group behavior, communication process, leadership, conflict management
	Dellavior Discipline	motivation management of change
		Kinds of contracts, contract constituents, contract administration, the
HUM 203	Trade Law	limitations as imposed by law, disputes, claims, arbitration, the legal
		variables encountered in business and commercial transactions.
HUM 206	Islamic Studies	Traditions of prophet Mohamed, Islamic society in Madinah, Muslims
		treatment of non-Muslims. The role of the mosque in Islamic society.
LNG 103	German Language	German hasic structures. Reading and understanding of simple texts
		An elementary French course. Drill in pronunciation. elementary
LNG 104	French Language	principles of inflection and basic sentence patterns. Reading of easy texts.
I NC 203	Cormon Longuago	Systematic discussion of grammatical difficulties. Oral practice and
L110 203	Ovi man Danguage	reading of more difficult texts. Practice in guided composition.
	Fromole I	Continuation of the audio Lingual method of intensive elementary French.
LING 204	r rench Language	keview of grammatical patterns. Expansion of conversational and written skills and vocabulary
ARE 230	Special Topics	To be designed according to requirements.
	~P-ciai ropico	

10- Program Admission Requirements:

The Higher Institute of Engineering and Technology at New Minia accepts the Egyptian high school certificate (scientific division) or equivalent certificate awarded by foreign country according to the rules and grades that applied by the national admission office in the supreme council of universities. The specialist stages of the program start after a successful pass of the preparatory year (level 0) with at least 33 units out of the required 44 units. The students are then distributed among the different programs in the Higher Institute according to rules set by the institute council that depend on the final grade in the preparatory year as well as students' self-selection and departments.

11- Regulations for Progression and Program Completion:

- The student should achieve at least 209 units in order to be graduated from the program with at least 1 GPA.
- The student is promoted to the next level of the program specialist stages if he/she fulfills the minimum registered and required units of his/her academic year.
- The student must attend more than 75% of the lectures, tutorials and laboratory exercises for each course, as a condition to be allowed to take the final exam. The student who does not meet the 75% attendance will not be allowed to take the final exam. He should make a request with an excuse that the department and institute councils can accept in order to be allowed to go through the final exam. In the case of request rejection, the student is considered "fail" in the course he/she was not allowed to attend its finals.
- The student is required to submit a graduation project in either architectural design or city planning fields according to his/her selection and the rules set by the department council. An extension of four weeks is given to students after the summer semester of level (4).
- The student is entitled to be examined in courses he failed with the students currently studying these courses. In case the student score is 65% and above from the course maximum mark, his mark is reduced to that of the upper limit of "Pass" grade.
- The mark and grade remain the same without change for the student who failed to appear for an examination due to an acceptable excuse.
- Without desecration of Articles 83, 84 and 85 of the executive bylaws of the University Regulation Law, the successful completion of a course is evaluated according to grade points as follows:

Grade	GPA	Equivalent Grade	Percentage
A+	4.0	Distinct (+)	More than 95%
А	3.7	Distinct	From 90 to less than 95%
A-	3.3	Distinct (-)	From 85 to less than 90%
B+	3.0	Very Good (+)	From 80 to less than 85%
В	2.7	Very Good	From 75 to less than 80%
C+	2.3	Good (+)	From 70 to less than 75%
С	2.0	Good	From 65 to less than 70%
D+	1.7	Pass (+)	From 60 to less than 65%
D	1.3	Pass	From 55 to less than 60%
D-	1.0	Pass (-)	From 50 to less than 55%
F	0.0	Fail	Less than 50%

Evaluator	Tool	Sample
1- Senior students	Questionnaire	Sample of 25% out of students in years 1,2 and 3
2- Alumni	Questionnaire	Sample of 25% of final year students
3- Stakeholders (Employers)	Questionnaire	Samples from different sectors
4-Internal Evaluator(s)	Internal Report	1-2 reports
5-External Evaluator(s)	External Report	1-2 reports
6- Other	Student's scientific conference according to the universities law of 49 in 1972.	1-Senior students2-Alumni3-Employees4-Stakeholders (Employers)

12- Program Evaluation Methods:

We certify that all of the information required to deliver this program is contained in the above specification and will be implemented.

Program Coordinator:	
Head of Architectural Engineering Dept.	Prof. Dr. Ashraf Abo El-Oyoun
Signature:	Ashref Holym
Quality Assurance Unit:	
Signature:	Medhat Forman
Dean and Chairman:	
Signature:	Ganal Aboutry