ELMinya H.I.E.T

Architectural Engineering BSc. Program

Program Specification

A- Basic Information

Program Title			
Architectural Engineering BSc.			
Program Type	Single	**Category**	Undergraduate
Dept. Offering the Program	Architectural Engineering Department	**System**	Credit Hours
Units Required for Graduation	209 units	**Awarded Degree**	BSc. In Architecture
Program Stages	**Preparatory Year (Level 0)**	44 Units	**Levels No.**	5 Levels
	Diploma (Level 1-2)	81.5 Units	**Semesters No.**	15 Semesters
	Bachelor (Level 2-3)	83.5 Units	**Academic Year**	2019/2020
Program Coordinator	**Assoc. Prof. Dr. Ashraf Abo El-Oyoun**		
External Evaluator (s)	**Assoc. Prof. Dr . Ismail Ahmed Amer**		
The most recent approval Date of program specification	**Dept. council**	No. (11) 14/10/2019	
	Academic council	No. (11) 23/10/2019	

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 is looking forward to graduating an engineer has outstanding scientific, innovative and creative capabilities. Also, he can practice his job in the highest degree of professionality with high sense regarding to the social responsibility.	The program is committed to providing advanced programs in the field of education, training and scientific research in accordance with the national academic standards

2- Academic Standards

The program adopts the National Academic Reference Standards, NARS for engineering in general and Architectural Engineering in specific approved by the department council No. (----) in - / 10 / 2014 and the institute academic council No. (----) in - / 10 / 2014

2.1- Program Aims in Relation to NARs Graduate Attributes

	NARs Graduate Attributes	Program Aims
Engineering	*Upon successful completion of program, the graduate should be able to:* Na) Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.	*Upon successful completion of program, the graduate should be able to:* Pa) Apply knowledge of mathematics, geometry, physics, and engineering concepts to the solution of engineering problems.
	Nb) Design a system; component and process to meet the required needs within realistic constraints.	Pb) Design a construction, or a system and/or conduct experiments within realistic constraints to collect, interpret data and analyse performance.
	Nc) Design and conduct experiments as well as analyze and interpret data.	
	Nd) Identify, formulate and solve fundamental engineering problems.	Pc) Identify, formulate and seek the appropriate solution for engineering problems.
	Ne) Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.	Pd) Use the scientific techniques, personal skills, and engineering different tools, necessary for engineering practice and project management.

	Nf) Work effectively within multi-disciplinary teams.	Pe) Work and communicate effectively within multi-disciplinary teams.
	Ng) Communicate effectively.	
	Nh) Consider the impacts of engineering solutions on society & environment.	Pf) Consider the impacts of engineering solutions on society & environment.
	Ni) Demonstrate knowledge of contemporary engineering issues.	Pg) Demonstrate knowledge of contemporary engineering issues and engage in self-learning life- long.
	Nj) Engage in self- and life- long learning.	
	Nk) Display professional and ethical responsibilities; and contextual understanding	Ph) Act in professional ethics, seriously take the responsibilities; and display a contextual understanding.
Architecture	Nl) Design robust architectural projects with creativity and technical mastery.	Pi) Employ high creativity skills and master technical architectural tools in designing robust architectural projects.
	Nm) Demonstrate investigative skills, attention to details, and visualize/ conceptualize skills.	Pj) Demonstrate the ability of adopting investigative manner and visualize / conceptualize skills in their work with giving attention to small details.
	Nn) Adopt a holistic problem-solving approach for complex, ambiguous, and open-ended challenges and scenarios.	Pl) Adopt a holistic problem-solving approach for complex, ambiguous, and open-ended challenges and scenarios.
	No) Demonstrate knowledge of cultural diversity, differences and the impact of a building on community character and identity.	Po) Determine the impact of buildings on the community characters and identity by demonstrating good knowledge of cultural, diversity and differences between communities.
	Np) Address urban issues, planning, and community needs through design work.	Pm) Consider the community needs related to urban issues and planning with addressing them in design work
	Nq) Recognize the new role of architectural engineer as the leader of design projects who can understand, assemble, and coordinate all of the disciplines to create a sustainable environment.	Pn) Recognize the new role of architectural engineer as the leader of design projects who has the ability to understand, assemble, and coordinate all of the disciplines to create a sustainable environment.

2.2-	**Program ILOs in Relation to National Academic Reference Standards (NARs)**

<table>
<tr>
<th colspan="2"></th>
<th>National Academic Reference Standards (NARs)</th>
<th>Program Intended Learning Outcomes (ILOs)</th>
</tr>
<tr>
<td rowspan="13">Knowledge and Understanding</td>
<td rowspan="12">Engineering</td>
<td><i>Upon successful completion of program, the graduate should have a knowledge and understanding of:</i></td>
<td><i>Upon successful completion of ARCH. program, the graduate should be able to:</i></td>
</tr>
<tr>
<td>NA1) Concepts and theories of mathematics and sciences, appropriate to the discipline.</td>
<td>A1) Outline the Concepts and theories of mathematics and sciences, related to different engineering.</td>
</tr>
<tr>
<td>NA2) Basics of information and communication technology (ICT)</td>
<td>A2) Recognize the Basics of information and communication technology (ICT)</td>
</tr>
<tr>
<td>NA3) Characteristics of engineering materials related to the discipline</td>
<td>A3) Define the characteristics of different engineering materials.</td>
</tr>
<tr>
<td>NA4) Principles of design including elements design, process and/or a system related to specific disciplines</td>
<td>A4) Understand the Principles of elements design, process and different engineering.</td>
</tr>
<tr>
<td>NA5) Methodologies of solving engineering problems, data collection and interpretation</td>
<td>A5)
Identify the Methodologies of solving engineering problems, data collection and interpretation.</td>
</tr>
<tr>
<td>NA6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues</td>
<td>A6)
Know the quality assurance systems, codes of practice and standards. In addition to, health and safety requirements considering environmental issues.</td>
</tr>
<tr>
<td>NA7) Business and management principles relevant to engineering</td>
<td>A7) Determine the Business and management principles relevant to engineering.</td>
</tr>
<tr>
<td>NA8) current engineering technologies that can serve different engineering discipline.</td>
<td>A8) Know the current engineering technologies that can serve different engineering discipline.</td>
</tr>
<tr>
<td>NA9) topics related to humanitarian interests and moral issues.</td>
<td>A9) Select the topics related to humanitarian interests and moral issues</td>
</tr>
<tr>
<td>NA10) technical language and report writing.</td>
<td>A10) understand the technical language and basics of technical report writing.</td>
</tr>
<tr>
<td>NA11) professional ethics and impacts of engineering solutions on society and environment.</td>
<td>A11) Acquire the necessary professional ethics and impacts of engineering solutions on society and environment</td>
</tr>
<tr>
<td>NA12) State Contemporary engineering topics</td>
<td>A12) Recognize different contemporary engineering topics.</td>
</tr>
<tr>
<td>Architecture</td>
<td>NA13)Principles of architectural design, and the preparation and presentations of design projects in a variety of contexts, scales, types and degree of complexity</td>
<td>A13)
Understand the principles of architectural design including elements of design, and the preparation and</td>
</tr>
</table>

		presentations of design projects in a variety of contexts, scales, types and degree of complexity
	NA14) The processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.	A14) Emphasize the significance of urban spaces by understanding the interaction between human behavior and natural environment; pattern and city problems; to achieve a sustainable design system that takes in account both climatic and energy consumption considerations and their impact on human health and safety.
	NA15) Principles of sustainable design, climatic considerations, and energy consumption and efficiency in buildings and their impacts on the environment.	
	NA16) Theories and legislations of urban and regional planning.	A15) Discuss the approaches, policies, and practices that can solve various dimensions of housing problems by understanding the theories and legislation of urban and regional planning
	NA17) Various dimensions of housing problem and the range of approaches, policies, and practices that could be carried out to solve this problem.	
	NA18) Fundamentals of building acquisition, operational costs, and of preparing construction documents and specifications of materials, components, and systems appropriate to the building.	A16) know the fundamentals of building acquisition, operational costs, construction management and preparing construction documents. Realize the role of architecture profession relative to the construction industry.
	NA19) The role of the architecture profession relative to the construction industry and the overlapping interests of organizations representing the built environment.	
	NA20)Principles of building technologies, structure & construction methods, technical installations, properties of materials, and the way they may influence design decisions	A17) Define the principles of building technologies, structure & construction methods, technical installations, properties of construction materials, and the way they may influence design decisions
	NA21) The significance of urban spaces and the interaction between human behavior, built environment and natural environment.	A18) Explain the significance of urban spaces and the interaction between human behavior, built environment and natural environment considering humanitarian interests and moral issues.
	NA22) Theories and histories of architecture, planning, urban design, and other related disciplines.	A19) Define theories and histories of architecture, planning, urban design, and other related disciplines.
	NA23) Physical modelling, multi-dimensional visualization, multimedia	A20) Use physical modelling, multi-

		applications, and computer-aided design.	dimensional visualization, multimedia applications, and computer-aided design.
Intellectual Skills	**Engineering**	*Upon successful completion of program, the graduate should have the ability to:*	*Upon successful completion of ARCH. program, the graduate should be able to:*
		NB1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems	B1) Select appropriate mathematical and computer-based methods for .modeling and analyzing problems
		NB2)Select appropriate solutions for engineering problems based on analytical thinking	B2) Select appropriate solutions for engineering problems based on .analytical thinking
		NB3)Think in a creative and innovative way in problem solving and design	B3) Think in a creative and innovative way in problem solving and design.
		NB4)Combine, exchange, and assess different ideas, views, and knowledge from a range of sources	B4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
		NB5)Assess and evaluate the characteristics and performance of components, systems and processes	B5) Assess and evaluate the characteristics and performance of components, systems and processes.
		NB6)Investigate the failure of components, systems, and processes	B6) Investigate the failure of components, systems, and processes.
		NB7)Solve engineering problems, often based on limited and possibly contradicting information	B7) Solve engineering problems, often based on limited and possibly contradicting information.
		NB8)Select and appraise appropriate ICT tools to a variety of engineering problems	B8) Select and appraise appropriate ICT tools to a variety of engineering problems.
		NB9)Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact	B9) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
		NB10)Incorporate economic, societal, environmental dimensions and risk	B10) Incorporate economic, societal, environmental dimensions and risk management in design.
		NB11)Analyze results of numerical models and assess their limitations	B11) Analyze results of numerical models and assess their limitations.
		NB12)Create systematic and methodic approaches when dealing with new and advancing technology	B12) Create systematic and methodic approaches when dealing with new and advancing technology.
	Architecture	NB13) Predict possible consequences, by-products and assess expected performance of design alternatives.	B13)Formulate informed opinions appropriate to architecture affecting circumstances using numerical models, and by the integrity of structure systems and building materials into the design process in order to asses expected performances of design alternatives.
		NB14) Integrate relationship of structure, building materials, and construction elements into design process.	

		NB15) Discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession & practice.	
		NB16) Integrate different forms of knowledge, ideas from other disciplines, and manage information retrieval to create new solutions.	B14) Integrate community design parameters into design projects, manage different forms of information retrieval from different sources in a methodological approach to create new solution.
		NB17)Integrate community design parameters into design projects.	
		NB18) Think three-dimensionally and engage images of places & times with innovation and creativity in the exploration of design.	B15)Think three – dimensionally and engage images of places & times with innovation and creativity in the exploration of design to appraise the spatial, aesthetic, technical and social qualities of a design within the scope of a wider environment using appropriate it tools.
		NB19)Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment	
		NB20) Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.	B16) Reconcile conflicting objectives and manage the contradicting and broad constituency of interests to analytically reach optimum solutions for Engineering problems.
		NB21) Analyze the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.	B17) Analyze the range of design patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.
Practical & Professional Skills	**Engineering**	*Upon successful completion of program, the graduate should have the ability to:*	*Upon successful completion of ARCH. program, the graduate should be able to:*
		NC1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	C1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering .problems
		NC2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.	C2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, .products and/or services
		NC3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.	C3)Create and/or re-design a process, component or system, and carry out specialized engineering designs
		NC4) Practice the neatness and aesthetics in design and approach	C4) Practice the neatness and aesthetics in design and approach.
		NC5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze	C5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to

		and interpret results.	design experiments, collect, analyze and interpret results.
		NC6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.	C6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.
		NC7) Apply numerical modeling methods to engineering problems.	C7) Apply numerical modeling methods to engineering problems.
		NC8) Apply safe systems at work and observe the appropriate steps to manage risks.	C8) Apply safe systems at work and observe the appropriate steps to manage risks.
		NC9) Demonstrate basic organizational and project management skills.	C9)Demonstrate basic organizational and project management skills
		NC10) Apply quality assurance procedures and follow codes and standards.	C10) Apply quality assurance procedures and follow codes and standards.
		NC11) Exchange knowledge and skills with engineering community and industry.	C11) Exchange knowledge and skills with engineering community and industry.
		NC12) Prepare and present technical reports.	C12)Prepare and present technical reports
	Architecture	NC13) Produce and present architectural, urban design, and planning projects using an appropriate range of media and design-based software.	C13) Produce professional workshop drawings and present architectural, urban design, and planning projects using computer- aided drawing techniques.
		NC14) Produce professional workshop and technical drawings using traditional drawing and computer-aided drawings' techniques.	
		NC15) Use appropriate construction techniques and materials to specify and implement different designs;	C14)Use suitable construction techniques and materials that can professionally participate in managing construction process and implement different designs that take into consideration safe systems, risk management, quality assurance, codes and standards.
		NC16) Participate professionally in managing construction processes.	
		NC17) Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.	C15)Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problem by applying mathematics, science and IT integrally, in which all contribute positively to the aesthetic and neatness of architectural design, urban identity and cultural life of a community.
		NC18) Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.	

		NC19) Display imagination and creativity	C16) Display imagination and creativity.
		NC20) Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.	C17)Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect in producing architectural design, urban design, planning projects and redesign projects.
		NC21) Provide leadership and education to the client particularly with reference to sustainable design principles.	C18) Provide leadership and education to the client particularly with reference to sustainable design principles using evidences from numerical modeling methods application.
		NC22) Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.	C19) Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.
General and Transferable Skills	**Engineering**	*Upon successful completion of program, the graduate should have the ability to:*	*Upon successful completion of ARCH. program, the graduate should be able to:*
		ND1) Collaborate effectively within multidisciplinary team.	D1) Collaborate effectively within multidisciplinary team.
		ND2) Work in stressful environment and within constraints.	D2) Work in stressful environment and within constraints.
		ND3) Communicate effectively.	D3) Communicate effectively.
		ND4) Demonstrate efficient IT capabilities.	D4) Demonstrate efficient IT capabilities.
		ND5) Lead and motivate individuals.	D5) Lead and motivate individuals.
		ND6) Manage tasks and resources efficiently.	D6) Effectively manage tasks, time, and resources.
		ND7) Search for information and engage in life-long self-learning discipline.	D7) Search for information and engage in life-long self-learning discipline.
		ND8) Acquire entrepreneurial skills.	D8) Acquire entrepreneurial skills.
		ND9) Refer to relevant literature effectively.	D9) Refer to relevant literatures.

3- Program ILOs Matrix in Relation to Courses for Every Stage and Level:

Higher Institute of Engineering & Technology. New Minya

Architecture Engineering Departement

Offered Courses IlOs with Program ILOs for every Academic year

Stage	Core - Elective Courses	Levels / Courses	SUBJECT_TITLE	SUBJECT_CODE	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	D1	D2	D3	D4	D5	D6	D7	D8	D9	SUM
Preparatory Year	Core Courses	Level Zero	Industrial Chemistry	CHM 001	X		X					X																	X																																											4
			Chemistry Laboratory	CHM 002			X		X																							X														X																	X					X	X		7
			Intro. to Computer	CS 001		X						X																					X									X				X																					X				6
			Comp. Prog.(A)	CS 002		X						X																					X									X				X																					X				6
			Eng. Drawing (A)	ENG 003				X		X																	X	X																	X																	X			X					7
			Eng. Drawing (B)	ENG 004				X		X																	X	X																	X																	X			X					7
			Prod. Tech. (A)	ENG 005			X	X	X			X																X									X																																		6
			Prod. Tech. (B)	ENG 006			X					X				X														X															X																									5
			Workshop (A)	ENG 009			X			X																				X				X									X	X					X												X	X		X					10
			Workshop (B)	ENG 010			X			X																				X				X									X	X					X												X	X		X					10
			Technical Concepts	ENG 011							X	X			X																				X																																		4
			Mechanices (A)	ENG 021	X				X																X		X			X												X																											6
			Mechanices (B)	ENG 022	X				X																X		X			X												X																											6
			Civil Heritage	HUM 001							X	X	X																																																								X	4
			Intro. Indus. Training	ITR 001																					X	X	X			X												X								X			X	X								X	X	X	X	X					13
			Eng. Lang. (A)	LNG 001							X	X																																											X								X								4
			Eng. Lang. (B)	LNG 002							X	X																																											X								X								4
			Mathematics (A)	MTH 001	X				X																X		X			X												X																											6
			Mathematics (B)	MTH 002	X				X																X		X			X												X																											6
			Phys. Educ. & Activ. (A)	PHE 001							X		X																																																		X			X						4
			Phys. Educ. & Activ. (B)	PHE 002							X		X																																																		X			X						4
			Physics (A)	PHY 001	X		X					X															X			X												X																											6
			Physics (B)	PHY 002	X		X					X															X			X												X																											6

Knowledge and Understanding — Engineering (A1–A12), Architecture (A13–A20); Intellectual Skills — Engineering (B1–B12), Architecture (B13–B17); Practical and Professional Skills — Engineering (C1–C12), Architecture (C13–C19); General And Treanferable Skills — Engineering (D1–D9); SUM of Skills in courses.

Diploma Stage

Core Courses — Engineering & Technonlgy & Humanity Courses

Level One (Arch)

Course	Code	Credits
Mathematics (C)	MTH 101	4
Fundamentals of Architectural Design	ARE 100	10
Theories of Design	ARE 101	10
Theory of Structures (1)	ARE 102	9
History of Architecture	ARE 103	10
Theories of Architecture (1)	ARE 105	10
Elements of Architectural Design	ARE 110	10
Climate and Desert Architecture	ARE 112	10
Materials and its Properties	ARE 116	10
Surveying	ARE 118	10
Building Construction	ARE 122	7
Perspective and Sciagraphy	ARE 117	6
Visual Training (A)	ARE 119	9
Visual Training (B)	ARE 129	8
Eng. Economics(1)	ENG 151	6
Eng. Lang. (C)	LNG 101	4
Management Princ.	MNG 101	8
Phys. Educ. & Activ. (C)	PHE 101	4
Industrial Training (1)	FTR 101	7

Level Two (Arch)

Course	Code	Credits
History and Theories of Urban Planning	ARE 104	10
Architectural Design of Simple Units	ARE 106	10
Architectural Design of Complex(1)	ARE 107	10
Urban Design in New Towns	ARE 114	10
Technical Installation for Buildings (A)	ARE 128	6
App. of Computers in Architecture (A)	ARE 124	10
Building Construction and Materials	ARE 126	8
Diploma Project	ARE 111	9
Environmental Control	ARE 121	10
Phys. Educ. & Activ. (D)	PHE 102	4
Phys. Educ. & Activ. (E)	PHE 103	4
Industrial Training (2)	FTR 102	6

Elective Courses — Basic Courses * (For Level one and Two)

Course	Code	Credits
Applied Mechanics	ENG 122	7
Mathematics (D)	MTH 102	4
Numerical Techniques	MTH 103	5
Mathematical Analysis	MTH 104	4

Humanity courses * (For Level one and Two)

Course	Code	Credits
Modern Egyptian History	HUM 102	5
Islamic Civilization (A)	HUM 103	4
Arabic Literature	HUM 104	4
German Language (A)	LNG 103	4
French Language (A)	LNG 104	4

B.S.C Stage

Core Courses — Engineering & Technolngy & Humanity Courses

Level Three (Arch)

Course	Code	Sum of courses in ILOs
Operations Researchs	ME 142	6
Statistical Teechnologies	MTH 105	4
Theory of Structures (B)	ARE 202	9
Architectural Design (A)	ARE 203	13
Town Planning (A)	ARE 204	10
Theory of Architecture (B)	ARE 205	8
Architectural Design (B)	ARE 206	11
Reinforced Concrete	ARE 212	10
Town Planning (B)	ARE 214	10
Steel Construction	ARE 222	10
App. of Computers in Architecture (B)	ARE 224	10
Eng. Lang. (D)	LNG 201	3
Phys. Educ. & Act. (1)	PHE 201	5
Phys. Educ. & Act. (2)	PHE 202	6
Industrial Training (3)	FTI 201	10

Level Four (Arch)

Course	Code	Sum of courses in ILOs
Desert Environment	DDP 100	9
Architectural Design of Complex(2)	ARE 207	11
Soil Mechanics and Foundation	ARE 208	9
Environmental Design	ARE 217	10
Technical Installation for Buildings (B)	ARE 218	7
Execution Design	ARE 219	5
Execution Design and Documents	ARE 220	10
B.S.C. Project	ARE 211	9
Egyptian History	HUM 201	3
Projects Management	MNG 201	10
Phys. Educ. & Act. (3)	PHE 203	3
Industrial Training (4)	FTI 202	7

Elective Courses — Technolngy Courses * — For Level Three and Four

Course	Code	Sum of courses in ILOs
Solar Architecture	ARE 221	9
Passive Heating and Cooling	ARE 223	6
Architectural Design Using Computers	ARE 225	9
Modern Technology & Desert Architecture	ARE 226	9
spical topics	ARE 230	10
Uses of solar energy	DDP 110	7

Humanity and Basic Courses * — For Level Three and Four

Course	Code	Sum of courses in ILOs
English Literature	HUM 202	4
Commercial Law	HUM 203	5
Industrial Psychology	HUM 204	5
Islamic Civilization (B)	HUM 205	3
Islamic Studies	HUM 206	3
German Language (B)	LNG 203	4
French Language (B)	LNG 204	4
Engineering Economics 2	MNG 221	9
Behavior Discipline	MNG 222	7

SUM of courses in ILOs: 19 6 12 10 20 9 7 13 25 12 16 8 10 10 5 11 11 10 8 6 20 10 17 24 8 6 10 9 13 8 5 23 14 12 5 13 21 9 7 11 10 5 5 7 5 7 12 15 11 19 16 7 11 6 5 15 14 20 13 22 19 4 15 5

4- Program ILOs with adopted Teaching and Learning Methods:

ILOs		Lectures	Tutorials and studio workshops	Open Discussion	Computer lab	projects	Report writing	Site visits – field survey	Case study	Office meeting
Knowledge and Understanding	A1	✓	✓			✓	✓		✓	
	A2	✓	✓		✓	✓				
	A3	✓	✓	✓			✓			
	A4	✓	✓	✓		✓	✓	✓		✓
	A5	✓	✓	✓		✓	✓	✓	✓	✓
	A6	✓	✓	✓			✓		✓	✓
	A7	✓	✓							
	A8	✓	✓	✓		✓	✓		✓	
	A9	✓	✓	✓			✓			✓
	A10									
	A11	✓	✓	✓		✓				
	A12	✓	✓	✓			✓	✓		
	A13	✓	✓	✓		✓	✓	✓	✓	✓
	A14	✓	✓	✓		✓	✓	✓	✓	✓
	A15	✓	✓	✓		✓	✓			✓
	A16	✓	✓	✓			✓	✓	✓	✓
	A17	✓	✓	✓			✓		✓	
	A18	✓	✓	✓		✓	✓	✓	✓	
	A19	✓	✓	✓			✓	✓	✓	✓
	A20	✓	✓	✓	✓	✓			✓	✓
Intellectual Skills	B1	✓	✓		✓					
	B2	✓	✓	✓		✓	✓	✓	✓	✓
	B3	✓	✓	✓		✓	✓			✓
	B4	✓	✓	✓		✓	✓	✓	✓	
	B5	✓	✓				✓	✓	✓	
	B6	✓	✓				✓	✓	✓	
	B7	✓	✓	✓		✓				
	B8	✓	✓		✓					
	B9	✓	✓				✓		✓	✓
	B10	✓	✓	✓						✓
	B11	✓	✓				✓			
	B12	✓	✓	✓		✓	✓			
	B13	✓	✓	✓		✓	✓	✓	✓	✓
	B14	✓	✓	✓		✓	✓	✓	✓	
	B15	✓	✓	✓		✓	✓		✓	✓
	B16	✓	✓			✓	✓			
	B17	✓	✓			✓	✓	✓	✓	

ILOs		Lectures	Tutorials and studio workshops	Open Discussion	Computer lab	projects	Report writing	Site visits – field survey	Case study	Office meeting
		Lectures	Tutorials and studio workshops	Open Discussion	Computer lab	projects	Report writing	Site visits – field survey	Case study	Office meeting
	C1	✓	✓	✓	✓		✓	✓		
	C2	✓	✓	✓		✓	✓	✓	✓	✓
	C3	✓	✓				✓	✓	✓	
	C4	✓	✓			✓	✓		✓	
	C5	✓	✓		✓	✓	✓	✓		
	C6	✓	✓		✓		✓			
	C7	✓	✓							
	C8	✓	✓							
	C9		✓	✓			✓			
	C10	✓	✓			✓		✓		
	C11	✓	✓	✓			✓	✓		✓
	C12	✓	✓	✓		✓	✓		✓	
	C13	✓	✓		✓	✓	✓		✓	
	C14	✓	✓	✓			✓	✓	✓	✓
	C15	✓	✓	✓		✓	✓	✓		
	C16	✓	✓	✓		✓	✓		✓	
	C17	✓	✓	✓			✓	✓		✓
	C18	✓	✓			✓	✓			
	C19	✓	✓			✓	✓	✓		
General and Transferable Skills	D1	✓	✓		✓	✓	✓	✓	✓	✓
	D2	✓	✓			✓	✓	✓	✓	✓
	D3	✓	✓	✓		✓	✓	✓		✓
	D4	✓	✓		✓	✓	✓			✓
	D5	✓	✓		✓	✓	✓	✓		✓
	D6	✓	✓	✓			✓			
	D7	✓	✓	✓		✓	✓			✓
	D8	✓	✓	✓			✓	✓		
	D9	✓	✓	✓		✓	✓		✓	

5-Program ILOs with adopted Assessment Methods:

ILOs		Written mid-term Exam	Oral Exam	Progress Test	Tutorial assignments	Reports	Project review	Homework	Oral Presentation	Written final term Exam
Knowledge and Understanding	A1	✓			✓	✓	✓	✓		✓
	A2	✓		✓	✓		✓	✓		✓
	A3	✓		✓	✓					✓
	A4	✓	✓	✓	✓	✓			✓	✓
	A5	✓			✓	✓	✓	✓	✓	✓
	A6	✓	✓		✓	✓			✓	✓
	A7	✓			✓					✓
	A8	✓		✓	✓	✓			✓	✓
	A9	✓			✓	✓			✓	✓
	A10									
	A11	✓	✓		✓	✓			✓	✓
	A12	✓	✓		✓	✓	✓	✓	✓	✓
	A13	✓			✓	✓	✓		✓	✓
	A14	✓	✓		✓	✓		✓	✓	✓
	A15	✓	✓		✓	✓	✓		✓	✓
	A16	✓	✓		✓	✓		✓	✓	✓
	A17	✓			✓	✓		✓	✓	✓
	A18	✓			✓	✓	✓	✓		✓
	A19	✓				✓	✓		✓	✓
	A20	✓	✓	✓	✓	✓		✓		
Intellectual Skills	B1	✓		✓			✓			✓
	B2	✓			✓	✓	✓	✓		✓
	B3	✓	✓	✓	✓	✓	✓	✓		✓
	B4	✓				✓			✓	✓
	B5	✓	✓		✓	✓	✓	✓	✓	✓
	B6	✓	✓		✓	✓			✓	✓
	B7	✓			✓	✓	✓			✓
	B8	✓		✓						✓
	B9	✓			✓	✓		✓		✓
	B10	✓			✓	✓	✓			✓
	B11	✓			✓	✓		✓		✓
	B12	✓			✓	✓		✓		✓
	B13	✓	✓		✓	✓	✓			✓
	B14	✓			✓	✓	✓		✓	✓
	B15	✓	✓	✓	✓	✓	✓		✓	✓
	B16	✓			✓	✓	✓		✓	✓
	B17	✓			✓	✓	✓		✓	✓

ILOs		Written mid-term Exam	Oral Exam	Progress Test	Tutorial assignments	Reports	Project review	Homework	Oral Presentation	Written final term Exam
	C1	✓	✓		✓	✓	✓	✓	✓	✓
	C2	✓	✓		✓	✓	✓	✓		✓
	C3	✓	✓	✓	✓	✓	✓	✓		✓
	C4	✓	✓		✓	✓	✓	✓	✓	✓
	C5	✓		✓	✓	✓	✓			✓
	C6	✓		✓						✓
	C7	✓			✓					✓
	C8	✓			✓					✓
	C9	✓			✓		✓		✓	✓
	C10	✓		✓	✓	✓	✓			✓
	C11	✓	✓			✓				✓
	C12	✓			✓	✓	✓		✓	✓
	C13	✓			✓	✓	✓			✓
	C14	✓	✓			✓	✓		✓	✓
	C15	✓			✓	✓	✓	✓		✓
	C16	✓				✓	✓		✓	✓
	C17	✓		✓	✓	✓	✓		✓	✓
	C18	✓			✓					✓
	C19	✓			✓	✓	✓			✓
General and Transferable Skills	D1	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D2	✓		✓	✓	✓	✓		✓	✓
	D3	✓	✓	✓	✓	✓	✓		✓	✓
	D4	✓	✓	✓	✓	✓	✓			✓
	D5	✓	✓		✓	✓	✓	✓	✓	✓
	D6	✓	✓		✓	✓	✓		✓	✓
	D7	✓	✓		✓	✓	✓	✓	✓	✓
	D8	✓			✓	✓		✓		✓
	D9	✓			✓	✓	✓		✓	✓

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

Stage	Level	Category	Code	Course Title	Total Credit Hours	NARS Subject Areas						
						A	**B**	**C**	**D**	**E**	**F**	**G**
						Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary Subjects
Preparatory	**Level (0)**	**Core Courses (Mandatory)**	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					

Stage	Level	Category	Code	Course Title	Total Credit Hours	A Humanities and Social Sciences	B Mathematics and Basic Sciences	C Basic Engineering Sciences	D Applied Engineering and Design	E Computer Applications and ICT	F Projects and Practice	G Discretionary Subjects
						NARS Subject Areas						
			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						
			ENG 011	Technical Concepts	1	1						
			ENG 009	Workshop (A)	1				1			
			ENG 003	Eng. Drawing (A)	2			2				
			CHM 002	Chemistry Laboratory	1				1			
			ENG 022	Mechanices (B)	2		2					
			MTH 002	Mathematics (B)	3		3					
			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	
Diploma Stage	Level (1) Arch	Core Courses (Mandatory)	MTH 101	Mathematics (C)	3		3					
			ARE 100	Fundamentals of Architectural Design	4			4				
			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				4			
			ARE 112	Climate and Desert	2			2				

Stage	Level	Category	Code	Course Title	Total Credit Hours	A Humanities and Social Sciences	B Mathematics and Basic Sciences	C Basic Engineering Sciences	D Applied Engineering and Design	E Computer Applications and ICT	F Projects and Practice	G Discretionary Subjects
				Architecture								
			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	
	Level (2) Arch		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			
			ARE 114	Urban Design in New Towns	3				3			
			ARE 128	Technical Installation for Buildings (A)	2			2				
			ARE 124	App. of Computers in Architecture (A)	3					3		
			ARE 126	Building Construction and Materials	4				4			
			ARE 111	Diploma Project	3						3	
			ARE 121	Environmental Control	2			2				
			PHE 102	Phys. Educ. & Activ. (D)	0.5	0.5						
			PHE 103	Phys. Educ. & Activ. (E)	0.5	0.5						
			FTR 102	Industrial Training (2)	5						5	
		Elective	ENG 122	Applied Mechanics	2							
			MTH 102	Mathematics D	3		4					
			MTH 103	Numerical Techniques	3							
			MTH 104	Mathematical Analysis	2							
			HUM 102	Modern Egyptian History	1							
			HUM 103	Islamic Civilization (A)	1	2						
			HUM 104	Arabic Literature	1							

Stage	Level	Category	Code	Course Title	Total Credit Hours	NARS Subject Areas						
						A	**B**	**C**	**D**	**E**	**F**	**G**
						Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary Subjects
Bachelor Stage			LNG 103	German Language (A)	1							
			LNG 104	French Language (A)	1							
	Level (3) Arch	Core Courses (Mandatory)	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				4			
			ARE 204	Town Planning (A)	3				3			
			ARE 205	Theory of Architecture (B)	4			4				
			ARE 206	Architectural Design (B)	4				4			
			ARE 212	Reinforced Concrete	2			2				
			ARE 214	Town Planning (B)	4				4			
			ARE 222	Steel Construction	2			2				
			ARE 224	App. of Computers in Architecture (B)	2					2		
			LNG 201	Eng. Lang. (D)	1	1						
			PHE 201	Phys. Educ. & Act. (1)	0.5	0.5						
			PHE 202	Phys. Educ. & Act. (2)	0.5	0.5						
			FTR 201	Industrial Training (3)	5						5	
	Level (4) Arch		DDP 100	Desert Environment	3				3			
			ARE 207	Architectural Design of Complex(2)	4				4			
			ARE 208	Soil Mechanics and Foundation	3			3				
			ARE 217	Environmental Design	4				4			
			ARE 218	Technical Installation for Buildings (B)	3			3				
			ARE 219	Execution Design	3				3			
			ARE 220	Execution Design and Documents	3				3			
			ARE 211	B.S.C. Project	4						4	
			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						5	
		Elective	DDP 110	Uses of solar energy	2							
			ARE 221	Solar Architecture	2							
			ARE 223	Passive Heating and Cooling	2							8
			ARE 225	Architectural Design Using Computers	2							

Stage	Level	Category	Code	Course Title	Total Credit Hours	NARS Subject Areas						
						A	**B**	**C**	**D**	**E**	**F**	**G**
						Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design	Computer Applications and ICT	Projects and Practice	Discretionary Subjects
			ARE 226	Modern Technology & Desert Architecture	2							
			ARE 230	Special Topics	2							
			HUM 202	English Literature	1							
			HUM 203	Commercial Law	1							
			HUM 204	Psychology	1							
			HUM 205	Islamic Civilization (B)	1	2						
			HUM 206	Islamic Studies	1							
			LNG 203	German Language (B)	1							
			LNG 204	French Language (B)	1							
			MNG 221	Engineering Economics 2	1							
			MNG 222	Behavior Discipline	1							
Total						**18**	**27**	**56**	**60**	**8**	**32**	**8**

Gap Analysis Summery

	Subject Area	Hours	NARS	EXISTING
A	**Humanities and Social Sciences**	**18**	**09:12**	**8.6**
B	**Mathematics and Basic Sciences**	**27**	**20:26**	**12.9**
C	**Basic Engineering Sciences**	**56**	**20:23**	**26.8**
D	**Applied Engineering and Design**	**60**	**20:22**	**28.7**
E	**Computer Applications and ICT**	**8**	**09:11**	**3.8**
F	**Projects and Practice**	**32**	**08:10**	**15.3**
G	**Discretionary Subjects**	**8**	**06:08**	**3.8**
	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 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-h
Diploma stage   = Level (1) + Level (2) = 81.5 Cr-h
Bachelor 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)

Code	Course Title	Weekly hours				Total Cr-h	Program ILOs covered by course
		Lect.	Exc.	Lab	Total		
							A3+B1+B6+D3
Total Weekly Hours							

8-2 Diploma Stage Core Courses (Mandatory): Level (1)

Code	Course Title	Lect.	Exc.	Lab	Total	Total Cr-h	Program ILOs covered by course
MTH 101	Mathematics (C)	2	2	0	4	3	
ARE 100	Fundamentals of Architectural Design	1	6	0	7	4	A4+A5+A11+A13+B2+B13+B14+C4+C15+D5
ARE 101	Theories of Design	2	1	0	3	2	A4+A5+A13+A15+A19+B3+B14+C2+C17+D7
ARE 102	Theory of Structures (1)	2	2	0	4	3	A1+A17+B5+B6+B13+C1+C3+C14+D8
ARE 103	History of Architecture	2	0	0	2	2	A9+A14+A18+A19+B4+B14+B17+C4+D3
ARE 105	Theories of Architecture (1)	3	0	0	3	3	A9+A19+B4+B13+B14+B11+C12+D1+D3
ARE 110	Elements of Architectural Design	1	6	0	7	4	A4+A5+A13+B2+B13+B14+C4+C15+D5
ARE 112	Climate and Desert Architecture	2	1	0	3	2	A6+A14+A18+B4+B5+B10+B12+B13+C17+D3
ARE 116	Materials and its Properties	2	1	0	3	2	A1+A3+A6+A11+A16+B11+B6+C1+C14+D8
ARE 118	Surveying	1	0	2	3	2	A1+A5+A6+A16+B11+C1+D2+D8+
ARE 122	Building Construction	1	2	0	3	2	A3+A8+A16+A17+B13+C14+D2
ARE 117	Perspective and Sciagraphy	1	2	0	3	2	A4+A20+B15+C16+D3+D7
ARE 119	Visual Training (A)	0	2	0	2	1	A4+A12+A18+B3+B14+B15+C4+C14+D3
ARE 129	Visual Training (B)	0	2	0	2	1	A4+A12+A20+B3+B15+C4+C16+D9
ENG 151	Eng. Economics(1)	1	0	0	1	1	
LNG 101	Eng. Lang. (C)	1	1	0	2	1	
MNG 101	Management Princ.	1	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	A16+B13+C2+C11+C14+D1+D5
	Total Weekly Hours						

8-3 Diploma Stage Core Courses (Mandatory): Level (2)

Code	Course Title	Lect.	Exc.	Lab	Total	Total Cr-h	Program ILOs covered by course
ARE 104	History and Theories of Urban Planning	2	2	0	4	3	A14+A15+A18+A19+B4+B17+C12+C15+C19+D3+D9
ARE 106	Architectural Design of Simple Units	1	6	0	7	4	A4+A5+A11+A13+B2+B13+B14+C4+C15+D6
ARE 107	Architectural Design of Complex(1)	1	6	0	7	4	A5+A11+A13+B2+B7+B13+B14+C4+C13+D2
ARE 114	Urban Design in New Towns	1	4	0	5	3	A5+A14+A15+A18+A19+B17+C15+C17+D2+D5
ARE 128	Technical Installation for Buildings (A)	1	2	0	3	2	A6+A17+B9+B14+C14+D6
ARE 124	App. of Computers in Architecture (A)	1	0	4	5	3	A2+A20+B1+B8+B12+B15+C5+C6+C13+D4

Code	Course Title	Lect.	Exc.	Lab	Total	Total Cr-h	Program ILOs covered by course
ARE 126	Building Construction and Materials	2	4	0	6	4	A3+A8+A16+A17+B12+B13+C14+D6
ARE 111	Diploma Project	1	4	0	5	3	A8+A11+A13+B9+B13+C10+D2
ARE 121	Environmental Control	2	0	0	2	2	A10+A11+A14+A18+B2+B9+B17+C15+C17+D3
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	A16+B13+C2+C11+C14+D1+D5
	Total Weekly Hours						

8-4   Diploma Stage Elective Courses*:   Level (1&2)

Code	Course Title	Weekly hours				Total Cr-h	Program ILOs covered by course
		Lect.	Exc.	Lab	Total		
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	2	1	0	3	2	
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)	1	1	0	2	1	
	Total Weekly Hours						

*** 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)

Code	Course Title	Weekly hours				Total Cr-h	Program ILOs covered by course
		Lect.	Exc.	Lab	Total		
MTH 105	Statistical Techniques	2	1	0	3	2	
ME 142	Operations Researchs	2	1	0	3	2	
ARE 202	Theory of Structures (B)	2	2	0	4	3	A1+A17+B5+B6+B13+C1+C3+C14+D8
ARE 203	Architectural Design (A)	1	0	6	7	4	A13+B2+B13+B14+B15+C4+C10+C13+C16+C17+D2+D5+D6
ARE 204	Town Planning (A)	2	2	0	4	3	A5+A15+A18+A19+B14+B16+C13+C15+C19+D1+D5
ARE 205	Theory of Architecture (B)	3	2	0	5	4	A19+B4+B16+B17+C12+C16+C19+D3
ARE 206	Architectural Design (B)	1	6	0	7	4	A13+A17+B10+B14+C4+C13+C15+C17+C19+D5+D6
ARE 212	Reinforced Concrete	2	1	0	3	2	A1+A17+B5+B11+B13+C1+C3+C7+C14+D8
ARE 214	Town Planning (B)	2	4	0	6	4	A14+A15+B16+C13+C15+C17+D1+D2+D5
ARE 222	Steel Construction	2	1	0	3	2	A1+A17+B6+B11+B13+C1+C3+C7+C14+D8

		Lect.	Exc.	Lab	Total	Total Cr-h	
ARE 224	App. of Computers in Architecture (B)	1	0	2	3	2	A2+A20+B1+B8+B13+ B15+C6+C13+C18+D4
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	A16+A17+B13+B16+C 1+C11+C14+C17+D1+ D5
	Total Weekly Hours						

8-6   Bachelor Stage Core Courses (Mandatory):   Level (4)

Code	Course Title	Weekly hours				Total Cr-h	Program ILOs covered by course
		Lect.	Exc.	Lab	Total		
DDP 100	Desert Environment	2	2	0	4	3	A14+A18+B5+B15+B1 7+C15+C17+C18+D3
ARE 207	Architectural Design of Complex(2)	1	6	0	7	4	A17+B3+B14+B1 7+C13+C15+C16+C17 +C19+D2+D4+D9
ARE 208	Soil Mechanics and Foundation	2	2	0	4	3	A1+A17+B6+B11+B13 +C1+C3+C14+D8
ARE 217	Environmental Design	1	6	0	7	4	A18+B5+B17+C2+C4+ C15+C18+D1+D4+D6
ARE 218	Technical Installation for Buildings (B)	2	2	0	4	3	A6+A17+B9+B15+C8+ C14+D4
ARE 219	Execution Design	2	3	0	5	3	A13+B17+C13+D4+D5
ARE 220	Execution Design and Documents	2	2	0	4	3	A7+A16+B9+B16+C5+ C9+C12+C14+D1+D5+ D6
ARE 211	B.S.C. Project	1	0	6	7	4	A13+B2+B13+B14+ B15+C10+C13+C16+ D5
HUM 201	Egypt History	1	0	0	1	1	
MNG 201	Projects Management	1	0	0	1	1	
PHE 203	Phys. Educ. & Act. (3)	0	0	1	1	0.5	
FTR 202	Industrial Training (4)	0	0	30	30	5	
	Total Weekly Hours						

8-7   Bachelor Stage Elective Courses*:   Level (3&4)

Code	Course Title	Weekly hours				Total Cr-h	Program ILOs covered by course
		Lect.	Exc.	Lab	Total		
DDP 110	Uses of solar energy	2	1	0	3	2	A14+A18+B17+C1+C1 5+C18+D6
ARE 221	Solar Architecture	2	1	0	3	2	A14+A18+B15+B17+C 1+C15+C17+D4+D6
ARE 223	Passive Heating and Cooling	2	1	0	3	2	A14+A18+B16+C15+C 17+D4
ARE 225	Architectural Design Using Computers	1	0	2	3	2	A2+A20+B1+B13+B15 +C3+C13+C18+D2+D7
ARE 226	Modern Technology & Desert Architecture	2	1	0	3	2	A8+A12+A16+A17+B1 2+B15+C14+C18+D4
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						

*** 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
Preparatory 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, liquifation 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/0 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 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.
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.

Diploma Stage Core Courses (Mandatory)– 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 Stage Core Courses (Mandatory)– Level (2)

ARE 104	**History And Theory Of Urban Planning**	A Study for the urban and city evolution through history (starting from 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	**Applications Of Computers In Architecture (A)**	A general introduction to computer graphics and its application in 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 of knowing sun angles in different points on earth different days and hours of the year. Architectural control of sun rays on buildings. Air: Study of movements of wind; and architectural control of air movements in and 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 their 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 (I)**	Difference between culture and civilization , Ibn Khaldun's concept of civilization, the foundation of Islamic civilization. The decline of Islamic civilization.
HUM 104	**Arabic Literature**	**Introduction to Arabic literature, students are introduced to various Arabic literature forms selected readings from representative contemporary literary figures.**

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 and related community facilities Emphasis will be on local environmental 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 co1ulnns 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 agriculture.**
ARE 207	Architectural Design Of Complex Building	Data gathering and analysis of different programs for building of complex nature or groups of buildings. Development of the architectural design of these buildings taking into consideration: space and visual aspects. This course is carried out with a special emphasis on modeling.
ARE 208	Soil Mechanics And Foundations	Physical properties of soil and soil testing: formation of the soil, physical and mechanical properties of soils and soil testing. Theory of consolidation: choice of the type of foundations. Design of the shallow foundations: isolated footings, combined footings and strap footings.
ARE 217	Environmental Design	Urban Design: objectives, components and dimensions, perception of the urban environments, the visual form at the city scale, major principles of urban design, analysis and design of spaces; and space systems and sequences. Landscape arch construction and analysis: site survey and analysis. Earth work computations: movement system details and projects.
ARE 218	Technical Installation For Buildings (B)	Illumination: Eye and vision, light characteristics and measurements, light sources, introduction to lighting design and Acoustics: the characteristics, absorption and distribution of sound absorbent building materials, insulation of sound, hints to acoustic design.Air conditioning: Psychometric charts, physical and physiological principles, fundamentals of heat transfer duct design, heating and cooling Cycles.
ARE 219	Execution Design	Detailed studies of wide-span and span structures, cladding and facing for skeleton structures, design and application of metal section for openings and partitions, derailed studies of stair cases with different desgins and 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 And Specifications	The preparation of a complete set of execution design of a given project containing a large span element designed by the student.
ARE 211	B.Sc. Project	The student should achieve the following: Architectural research: Independent investigation by the student on the final project Such as (data gathering , analyzing , .., etc.) Architectural design: Application of the research and development of the architectural design of the final project.
FTR 202	Field Training (4)	The student shall be trained to execute the following : Prepare design calculation sheets ; Prepare design drawings and working details to be used on site; Prepare all notes related to the works to guarantee the execution of all works according to project specifications .

Bachelor Stage Elective Courses – Level (3&4)

MTH 105	Statistical Methods	**Definition of statistics, frequency tables and histograms, cumulative frequency, basic statistical concepts, probability, conditional**

		probability and independence, rules of probability, random variables 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.
PHE 201	**Physical Education And Activities (1)**	Introduction to Plastic Arts : Appreciation of the artistic aspects of natural 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)**	Introduction to Dramatic Arts : Origin and development of dramatic art vocal training and oral performance character representation dealing with the audience study of different dramatic forms, play acting .
HUM 201	**History Of Egypt**	The development of the social, political and economic systems. The rise and development of the national movement and its role in achieving independence and democracy.
Mng 201		
PHE 203	**Physical Education And Activities (3)**	Photography : History of Photography from 1826 up to the present time, theoretical aspects of photography types of cameras : Polaroid, automatic, single reflex (SLR) etc. photography in practice taking photo picture, developing , printing, making homemade line films, using video .
DDP 110	**Solar Energy Utilization**	Solar Energy Conversion Technology: Storage systems, collection of solar energy, solar cooling, solar space heating, and solar water heaters. Applications and economic analysis.
ARE 221	**Solar Architecture**	Solar movement, Solar reclamation, fundamentals of solar heating and cooling, active solar design for space heating, cooling and domestic hot water, passive solar design for space heating and cooling, performance; and economic analysis and the integration of solar concepts into building design.
ARE 223	**Passive Heating And Cooling**	Characteristics of solar radiation, transparent surfaces and glasses, characteristics of building materials, effect of wind directions, passive designs, thermal storage walls, thermal storage roofs, direct gain and passive architectural design.
ARE 225	**Architectural Design Using Computers**	Over view of the techniques of computer image synthesis, including both the hardware and software, line drawing and color raster graphics homogeneous coordinates, hidden surface and smooth shading algorithms.
ARE 226	**Modern Technology And Desert Architecture**	This Course is designed to give the students the properties and characteristics of new building materials suitable for desert architecture. It also gives the students the applications of new technology in desert architecture such as solar, ventilation, lighting .. etc.
HUM 204	**Industrial Psychology**	An introduction to the history, methods and the major theories, concepts of industrial psychology. The course provides non-majors with an overview of the field of industrial psychology, while majors gain a foundation for further study.
HUM 205	**Islamic Civilization (Ii)**	Intellectual aspect of Islam prominent Arab and Muslim scholars and their contribution to various scientific feed mathematics, astronomy, chemistry, medicine…..etc.
HUM 202	**English Literature**	Introduction to the forms of literature, short story, novel, drama and poetry. Developing students' critical ability through carefully selected sample literary texts.
MNG 221	**Engineering Economy (Ii)**	Costing and costing systems, depreciation methods, breakeven analysis, replacement analysis, decision making under certainty, decision making under risk, evaluation of public projects.
MNG 222	**Behavior Discipline**	A study of organization theories, concepts and structures, individual and group behavior, communication process, leadership, conflict management, motivation, management of change.
HUM 203	**Trade Law**	Kinds of contracts, contract constituents, contract administration, the 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**	Beginner's course. Development of speaking ability and mastering of German basic structures. Reading and understanding of simple texts.
LNG 104	**French Language**	An elementary French course. Drill in pronunciation, elementary principles of inflection and basic sentence patterns. Reading of easy texts.
LNG 203	**German Language**	Systematic discussion of grammatical difficulties. Oral practice and reading of more difficult texts. Practice in guided composition.
LNG 204	**French Language**	Continuation of the audio Lingual method of intensive elementary French. Review of grammatical patterns. Expansion of conversational and written skills and vocabulary.
ARE 230	**Special Topics**	To be designed according to requirements.

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 requirements.

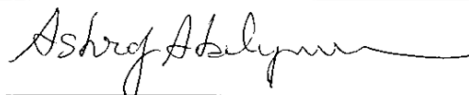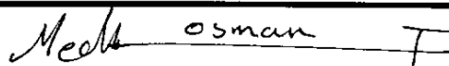## 11- Regulations for Progression and Program Completion:

- The student should achieve at least 209 units in order to be graduated from the program with at least ---- 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%
A	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%
B	2.7	Very Good	From 75 to less than 80%
C+	2.3	Good (+)	From 70 to less than 75%
C	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%

12- Program Evaluation Methods:

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 students 2-Alumni 3-Employees 4-Stakeholders (Employers)

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:	

Quality Assurance Unit:	Dr. Medhat Mohammed Osman
Signature:	

Dean and Chairman:	Prof. Dr. Gamal El-Dean Ali Abo Al-Magd
Signature:	