

Minoufiya University  
Faculty of Engineering  
Department of Architectural Engineering

**PROGRAM SPECIFICATION**

**UNDERGRADUATE PROGRAMS**

**Friday, November 16, 2012**

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## Undergraduate Programs

<b>Architectural Engineering Program specification</b>
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### 1 Basic information:

1- Program name	Architectural Engineering
2- Program type	Single
3- Adoption Date	September 2006
4- Study system	Semester System

### 2 Specialized Information:

#### 2.1 Program Mission

The mission of the Architectural Engineering program stems from the mission of the Faculty of Engineering of Minoufiya University, to educate Architectural engineering students to be Architects and Planners in the fields of Architecture and Planning, in the best of the Engineering Profession and According to the National Education Quality Standards. The graduates should be fully aware of requirements of both the society and the environmental; and conscious of professional ethics.

#### 2.2 Program Objectives

The graduates of the engineering programs should be able to:

- 1- Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.
- 2- Design a system; component and process to meet the required needs within realistic constraints.
- 3- Design and conduct experiments as well as analyse and interpret data.
- 4- Identify, formulate and solve fundamental engineering problems.
- 5- Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.
- 6- Work effectively within multi-disciplinary teams.
- 7- Communicate effectively.
- 8- Consider the impacts of engineering solutions on society& environment.
- 9- Demonstrate knowledge of contemporary engineering issues.
- 10- Display professional and ethical responsibilities; and contextual understanding
- 11- Engage in self- and life- long learning.

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In addition to the general attributes of engineer, the architect must be able to:

- 12- Design robust architectural projects with creativity and technical mastery.

- 13- Demonstrate investigative skills, attention to details, and visualize/ conceptualize skills.
- 14- Adopt a holistic problem solving approach for complex, ambiguous, and open-ended challenges and scenarios.
- 15- Demonstrate knowledge of cultural diversity, differences and the impact of a building on community character and identity.
- 16- Address urban issues, planning, and community needs through design work.
- 17- 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.

## 2.3 Program Academic Reference Standards

The program adopts the National Academic Reference Standards (NARS) for Engineering and NARS for Characterization, which are:

2.3.1 Knowledge and Understanding	By the end of the program, graduate should demonstrate knowledge and understanding of:	
	<b>Engineering</b>	<p>A1) Concepts and theories of mathematics and sciences, appropriate to the discipline.</p> <p>A2) Basics of information and communication technology (ICT)</p> <p>A3) Characteristics of engineering materials related to the discipline.</p> <p>A4) Principles of design including elements design, process and/or a system related to specific disciplines.</p> <p>A5) Methodologies of solving engineering problems, data collection and interpretation</p> <p>A6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.</p> <p>A7) Business and management principles relevant to engineering.</p> <p>A8) Current engineering technologies as related to disciplines.</p> <p>A9) Topics related to humanitarian interests and moral issues.</p> <p>A10) Technical language and report writing</p> <p>A11) Professional ethics and impacts of engineering solutions on society and environment</p> <p>A12) Contemporary engineering topics.</p>
		<p>A13) Principles of architectural design, and the preparation and presentations of design projects in a variety of contexts, scales, types and degree of complexity.</p> <p>A14) Principles of building technologies, structure &amp; construction methods, technical installations, properties of materials, and the way they may influence design decisions.</p> <p>A15) Fundamentals of building acquisition, operational costs, and of preparing construction documents and specifications of materials, components, and systems appropriate to the building.</p> <p>A16) Theories and legislations of urban and regional planning.</p> <p>A17) The processes of spatial change in the built and natural environments; patterns and problems of cities; and positive &amp; negative impacts of urbanization.</p>

2.3.2Intellectual Skills	By the end of the program, the graduates of the engineering programs should be able to:	
	<b>Engineering</b>	<p>B1) Select appropriate mathematical and computer-based methods for modelling and analysing problems.</p> <p>B2) Select appropriate solutions for engineering problems based on analytical thinking.</p> <p>B3) Think in a creative and innovative way in problem solving and design.</p> <p>B4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.</p> <p>B5) Assess and evaluate the characteristics and performance of components, systems and processes.</p> <p>B6) Investigate the failure of components, systems, and processes.</p> <p>B7) Solve engineering problems, often on the basis of limited and possibly contradicting information.</p> <p>B8) Select and appraise appropriate ICT tools to a variety of engineering problems.</p> <p>B9) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.</p> <p>B10) Incorporate economic, societal, environmental dimensions and risk management in design.</p> <p>B11) Analyse results of numerical models and assess their limitations.</p> <p>B12) Create systematic and methodical approaches when dealing with new and advancing technology.</p>
	<b>Architectural Engineering</b>	<p>B13) Integrate different forms of knowledge, ideas from other disciplines, and manage information retrieval to create new solutions.</p> <p>B14) Think three-dimensionally and engage images of places &amp; times with innovation and creativity in the exploration of design.</p> <p>B15) Predict possible consequences, by- products and assess expected performance of design alternatives.</p> <p>B16) Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.</p> <p>B17) Integrate relationship of structure, building materials, and construction elements into design process.</p> <p>B18) Integrate community design parameters into design projects.</p> <p>B19) Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.</p> <p>B20) Discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession and practice.</p> <p>B21) Analyse the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.</p>

2.3.3 Professional Skills	By the end of the program, the graduates of the engineering programs should be able to:	
	<b>Engineering</b>	<p>C1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.</p> <p>C2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.</p> <p>C3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.</p> <p>C4) Practice the neatness and aesthetics in design and approach.</p> <p>C5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results.</p> <p>C6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.</p> <p>C7) Apply numerical modelling methods to engineering problems.</p> <p>C8) Apply safe systems at work and observe the appropriate steps to manage risks.</p> <p>C9) Demonstrate basic organizational and project management skills.</p> <p>C10) Apply quality assurance procedures and follow codes and standards.</p> <p>C11) Exchange knowledge and skills with engineering community and industry.</p> <p>C12) Prepare and present technical reports.</p>
	<b>Architectural Engineering</b>	<p>C13) Produce and present architectural, urban design, and planning projects using an appropriate range of media and design-based software.</p> <p>C14) Produce professional workshop and technical drawings using traditional drawing and computer-aided drawings' techniques.</p> <p>C15) Use appropriate construction techniques and materials to specify and implement different designs;</p> <p>C16) Participate professionally in managing construction processes.</p> <p>C17) Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.</p> <p>C18) Display imagination and creativity.</p> <p>C19) Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.</p> <p>C20) Provide leadership and education to the client particularly with reference to sustainable design principles.</p> <p>C21) Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.</p> <p>C22) Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.</p>

2.3.4 General Skills	By the end of the program, the graduates should be able to:	
	<b>Engineering and Architectural Engineering</b>	D1) Collaborate effectively within multidisciplinary team. D2) Work in stressful environment and within constraints. D3) Communicate effectively. D4) Demonstrate efficient IT capabilities. D5) Lead and motivate individuals. D6) Effectively manage tasks, time, and resources. D7) Search for information and engage in life-long self-learning discipline. D8) Acquire entrepreneurial skills. D9) Refer to relevant literatures.

## 2.4 Relation between Academic Standards and Objectives

Academic Standards		Program objectives																
		O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13	O14	O15	O16	O17
Knowledge and Understanding	A1) Concepts and theories of mathematics and sciences, appropriate to the discipline	■		■	■													
	A2) Basics of information and communication technology (ICT)					■	■											
	A3) Characteristics of engineering materials related to the discipline.		■	■														
	A4) Principles of design including elements design, process and/or a system related to specific disciplines.		■		■				■									
	A5) Methodologies of solving engineering problems, data collection and interpretation		■		■													
	A6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.		■	■	■	■			■									
	A7) Business and management principles relevant to engineering.					■												
	A8) Current engineering tech. As related to disciplines.		■			■				■								
	A9) Topics related to humanitarian interests and moral issues.							■			■							
	A10) Technical language and report writing					■		■				■						
	A11) Professional ethics and impacts of engineering solutions on society and environment								■		■							
	A12) Contemporary engineering topics.									■								
	A13) Principles of architectural design, and the preparation and presentations of design projects in a variety of contexts, scales, types and degree of complexity.				■	■						■			■			
	A14) Principles of building technologies, structure & construction methods, technical installations, properties of materials, and the way they may influence design decisions.													■	■			

Academic Standards	Program objectives																
	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13	O14	O15	O16	O17
A15) Fundamentals of building acquisition, operational costs, and of preparing construction documents and specifications of materials, components, and systems appropriate to the building.													■				
A16) Theories and legislations of urban and regional planning.									■			■					
A17) The processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.				■													

Academic Standards	Program objectives																
	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13	O14	O15	O16	O17
Intellectual Skills	B.1) Select appropriate mathematical and computer-based methods for modelling and analysing problems.	■		■	■												
	B2) Select appropriate solutions for engineering problems based on analytical thinking.				■	■											
	B3) Think in a creative and innovative way in problem solving and design.		■	■													
	B4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.		■		■			■									
	B5) Assess and evaluate the characteristics and performance of components, systems and processes.		■	■	■	■		■									
	B6) Investigate the failure of components, systems, and processes.		■		■				■								
	B7) Solve engineering problems, often on the basis of limited and possibly contradicting information.						■			■							
	B8) Select and appraise appropriate ICT tools to a variety of engineering problems.				■		■				■						
	B9) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.		■	■	■	■		■									
	B10) Incorporate economic, societal, environmental dimensions and risk management in design.								■								
	B11) Analyse results of numerical models and assess their limitations.				■	■					■			■			
	B12) Create systematic and methodical approaches when dealing with new and advancing technology.												■	■			
	B13) Integrate different forms of knowledge, ideas from other disciplines,	■	■	■	■			■									



Academic Standards		Program objectives																
		O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13	O14	O15	O16	O17
	and manage information retrieval to create new solutions.																	
	B14) Think three-dimensionally and engage images of places & times with innovation and creativity in the exploration of design.																	
	B15) Predict possible consequences, by-products and assess expected performance of design alternatives.	■		■	■						■		■	■				
	B16) Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.					■	■								■	■		
	B17) Integrate relationship of structure, building materials, and construction elements into design process.		■	■								■	■					
	B18) Integrate community design parameters into design projects.		■		■				■			■		■				■
	B19) Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.		■		■							■		■				
	B20) Discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession and practice.		■	■	■	■			■			■	■	■	■			■
	B21) Analyse the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.					■									■			

Academic Standards		Program objectives																
		O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13	O14	O15	O16	O17
Professional Skills	C1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	■		■	■					■		■	■					■
	C2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.					■	■							■	■			
	C3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.		■	■							■	■						
	C4) Practice the neatness and aesthetics in design and approach.		■		■				■		■		■				■	
	C5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results.		■		■						■		■					

Academic Standards	Program objectives																
	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13	O14	O15	O16	O17
C6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.		■	■	■	■			■		■	■	■	■			■	
C7) Apply numerical modelling methods to engineering problems.	■		■	■													
C8) Apply safe systems at work and observe the appropriate steps to manage risks.					■	■											
C9) Demonstrate basic organizational and project management skills.		■	■														
C10) Apply quality assurance procedures and follow codes and standards.		■		■				■									
C11) Exchange knowledge and skills with engineering community and industry.		■		■													
C12) Prepare and present technical reports.		■	■	■	■			■									
C13) Produce and present architectural, urban design, and planning projects using an appropriate range of media and design-based software.					■												
C14) Produce professional workshop and technical drawings using traditional drawing and computer-aided drawings' techniques.		■			■				■								
C15) Use appropriate construction techniques and materials to specify and implement different designs.							■			■							
C16) Participate professionally in managing construction processes.					■		■				■						
C17) Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.								■		■							
C18) Display imagination and creativity.									■								
C19) Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.				■	■						■			■			
C20) Provide leadership and education to the client particularly with reference to sustainable design principles.													■	■			
C21) Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.													■				
C22) Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.	■		■	■													

Academic Standards		Program objectives																
		O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13	O14	O15	O16	O17
General Skills	D1) Collaborate effectively within multidisciplinary team.	■		■	■					■		■	■					■
	D2) Work in stressful environment and within constraints.					■	■							■	■			
	D3) Communicate effectively.		■	■							■	■						
	D4) Demonstrate efficient IT capabilities.		■		■				■		■		■				■	
	D5) Lead and motivate individuals.		■		■						■		■					
	D6) Effectively manage tasks, time, and resources.		■	■	■	■			■		■	■	■	■			■	
	D7) Search for information and engage in life-long self-learning discipline.					■								■				
	D8) Acquire entrepreneurial skills.	■		■	■					■		■	■					■
	D9) Refer to relevant literatures.					■	■							■	■			

## 2.5 INTENDED LEARNING OUTCOMES (ILOS) OF THE PROGRAM

The program extracts its Intended Learning Outcomes (ILOS) from the National Academic Reference Standards (NARS) for Engineering and NARS for Characterization as follows:

Field	Academic Standards of the program	Intended Learning Outcomes (ILOS) of the program
Knowing and understanding	By the end of the program, student should be able to demonstrate knowledge and understanding of:	By the end of the program, student should be able to:
	A1) Concepts and theories of mathematics and sciences, appropriate to the discipline.	A1) Explain concepts and theories of mathematics and sciences, appropriate to the discipline.
	A2) Basics of information and communication technology (ICT)	A2) Define basics of information and communication technology (ICT)
	A3) Characteristics of engineering materials related to the discipline.	A3) Define characteristics of engineering materials related to the discipline.
	A4) Principles of design including elements design, process and/or a system related to specific disciplines.	A4) Explain principles of design including elements design, process and/or a system related to specific disciplines.
	A5) Methodologies of solving engineering problems, data collection and interpretation	A5) Explain methodologies of solving engineering problems, data collection and interpretation
	A6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.	A6) Explain quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.
	A7) Business and management principles relevant to engineering.	A7) Define business and management principles relevant to engineering.
	A8) Current engineering tech. As related to disciplines.	A8) Explain current engineering tech. As related to disciplines.
	A9) Topics related to humanitarian interests and moral issues.	A9) Integrate topics related to humanitarian interests and moral issues.
	A10) Technical language and report writing.	A10) Demonstrate abilities for technical language and report writing.
	A11) Professional ethics and impacts of engineering solutions on society and environment	A11) Define professional ethics and impacts of engineering solutions on society and environment
	A12) Contemporary engineering topics.	A12) Explain contemporary engineering topics.
	A13) Principles of architectural design, and the preparation and presentations of design projects in a variety of contexts, scales, types and degree of complexity.	A13) Explain principles of architectural design, and the preparation and presentations of design projects in a variety of contexts, scales, types and degree of complexity.
	A14) Principles of building technologies, structure & construction methods, technical installations, properties of materials, and the way they may influence design decisions.	A14) Explain principles of building technologies, structure & construction methods, technical installations, properties of materials, and the way they may influence design decisions.
	A15) Fundamentals of building acquisition, operational costs, and of preparing construction documents and specifications of materials, components, and systems appropriate to the building.	A15) Remember fundamentals of building acquisition, operational costs, and of preparing construction documents and specifications of materials, components, and systems appropriate to the building.
	A16) Theories and legislations of urban and regional planning.	A16) Demonstrate theories and legislations of urban and regional planning.
	A17) The processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.	A17) Explain the processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.

<b>Field</b>	<b>Academic Standards of the program</b>	<b>Intended Learning Outcomes (ILOs) of the program</b>
	Student should be able to:	
Intellectual Skills	B1) Select appropriate mathematical and computer-based methods for modelling and analysing problems.	B1) Describe appropriate mathematical and computer-based methods for modelling and analysing problems.
	B2) Select appropriate solutions for engineering problems based on analytical thinking.	B2) Use appropriate solutions for engineering problems based on analytical thinking.
	B3) Think in a creative and innovative way in problem solving and design.	B3) Prove thinking in a creative and innovative way in problem solving and design.
	B4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.	B4) Show abilities to combine, exchange, and assess different ideas, views, and knowledge from a range of sources.
	B5) Assess and evaluate the characteristics and performance of components, systems and processes.	B5) Demonstrate how to assess and evaluate the characteristics and performance of components, systems and processes.
	B6) Investigate the failure of components, systems, and processes.	B6) Conduct an investigation of the failure of components, systems, and processes.
	B7) Solve engineering problems, often on the basis of limited and possibly contradicting information.	B7) Prove the ability to solve engineering problems, often on the basis of limited and possibly contradicting information.
	B8) Select and appraise appropriate ICT tools to a variety of engineering problems.	B8) Show skills for selecting and appraising appropriate ICT tools to a variety of engineering problems.
	B9) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.	B9) Prove the ability to judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
	B10) Incorporate economic, societal, environmental dimensions and risk management in design.	B10) Demonstrate the ability to incorporate economic, societal, environmental dimensions and risk management in design.
	B11) Analyse results of numerical models and assess their limitations.	B11) Prove the ability to analyse results of numerical models and assess their limitations.
	B12) Create systematic and methodical approaches when dealing	B12) Demonstrate the skills needed for creating systematic and methodical

	with new and advancing technology.	approaches when dealing with new and advancing technology.
	B13) Integrate different forms of knowledge, ideas from other disciplines, and manage information retrieval to create new solutions.	B13) Develop integrates different forms of knowledge, ideas from other disciplines, and manages information retrieval to create new solutions.
	B14) Think three-dimensionally and engage images of places & times with innovation and creativity in the exploration of design.	B14) Produce three-dimensionally and engage images of places & times with innovation and creativity in the exploration of design.
	B15) Predict possible consequences, by- products and assess expected performance of design alternatives.	B15) Predict possible consequences, by-products and assess expected performance of design alternatives.
	B16) Reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.	B16) The ability to reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.
	B17) Integrate relationship of structure, building materials, and construction elements into design process.	B17) The ability to integrate relationship of structure, building materials, and construction elements into design process.
	B18) Integrate community design parameters into design projects.	B18) The ability to integrate community design parameters into design projects.
	B19) Appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.	B19) The ability to appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.
	B20) Discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession and practice.	B20) The ability to discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession and practice.
	B21) Analyse the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.	B21) Explain the analyses the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.

Field	Academic Standards of the program	Intended Learning Outcomes (ILOs) of the program
	Student should be able to:	
Professional Skills	C1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	C1) Show the ability to apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.
	C2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.	C2) Demonstrate the skills for professionally merging the engineering knowledge, understanding, and feedback to improve design, products and/or services.
	C3) 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.
	C4) Practice the neatness and aesthetics in design and approach.	C4) Develop the practice the neatness and aesthetics in design and approach.
	C5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results.	C5) Show the ability to use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results.
	C6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.	C6) Prove the ability to use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.
	C7) Apply numerical modelling methods to engineering problems.	C7) Demonstrate the ability to apply numerical modelling methods to engineering problems.
	C8) Apply safe systems at work and observe the appropriate steps to manage risks.	C8) Demonstrate the ability to apply safe systems at work and observe the appropriate steps to manage risks.
	C9) Demonstrate basic organizational and project management skills.	C9) Prove the skills needed for basic organizational and project management skills.
	C10) Apply quality assurance procedures and follow codes and standards.	C10) Show skills for quality assurance procedures and follow codes and standards.
	C11) Exchange knowledge and skills with engineering community and industry.	C11) Indicate the talent to exchange knowledge and skills with engineering community and industry.
	C12) Prepare and present technical reports.	C12) Prove the competences to prepare and present technical reports.
	C13) Produce and present architectural, urban design, and planning projects using an appropriate range of media and design-based software.	C13) Produce and present architectural, urban design, and planning projects using an appropriate range of media and design-based software.
	C14) Produce professional workshop and technical drawings using traditional drawing and computer-aided drawings' techniques.	C14) Produce professional workshop and technical drawings using traditional drawing and computer-aided drawings' techniques.
	C15) Use appropriate construction	C15) Use appropriate construction techniques

	techniques and materials to specify and implement different designs.	and materials to specify and implement different designs.
	C16) Participate professionally in managing construction processes.	C16) Participate professionally in managing construction processes.
	C17) Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.	C17) Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.
	C18) Display imagination and creativity.	C18) Display imagination and creativity.
	C19) Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.	C19) Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.
	C20) Provide leadership and education to the client particularly with reference to sustainable design principles.	C20) Provide leadership and education to the client particularly with reference to sustainable design principles.
	C21) Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.	C21) Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.
	C22) Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.	C22) Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.

Field	Academic Standards of the program	Intended Learning Outcomes (ILOs) of the program
	Student should be able to:	
General Skills	D1) Collaborate effectively within multidisciplinary team.	D1) Demonstrate the ability for collaborating effectively within multidisciplinary team.
	D2) Work in stressful environment and within constraints.	D2) Prove the capacity to work in stressful environment and within constraints.
	D3) Communicate effectively.	D3) Demonstrate the ability to communicate effectively.
	D4) Demonstrate efficient IT capabilities.	D4) Establish skills for efficient and effective use of IT capabilities.
	D5) Lead and motivate individuals.	D5) Demonstrate the ability to lead and motivate individuals.
	D6) Effectively manage tasks, time, and resources.	D6) Prove the capability for effectively managing tasks, time, and resources.
	D7) Search for information and engage in life-long self-learning discipline.	D7) Prove the skills for searching for information and engage in life-long self-learning discipline.
	D8) Acquire entrepreneurial skills.	D8) Demonstrate that entrepreneurial skills are acquired.
	D9) Refer to relevant literatures.	D9) Show the ability to refer to relevant literatures.



## Relationship Between ILOs and Courses

Intended Learning Outcomes (ILOs) of the program		Courses that assess in realizing ILOs
Knowing and Understanding	By the end of the program, student should be able to:	
	A1) Explain concepts and theories of mathematics and sciences, appropriate to the discipline.	ARC 323(Urban and Environmental Conservation), ARC 303(Urban Planning), ARC416B (Housing Economics), ARC113 (Sciagraphy & Perspective (A)), ARC 121(Sciagraphy & Perspective (B)), ARC412(Regional Planning), ARC416C(Urban Design), ARC416A(Contemporary Architecture and Heritage), ARC 314(History and Theories of Architecture (3)), ARC324D(Design and Environmental Planning), ARC 211(History and Theories of Architecture (2)), ARC415C(Planning Projects), ARC421B(Theories of Housing (4)), BES011(Mathematics (1-A)), BES021(Mathematics (1-B)), BES012(Physics (1-A)), BES022(Physics (1-B)), BES003(Mechanics ), BES013(Chemistry), PRE001(Engineering Drawing & Projection), BES014(History of Eng- Sciences)
	A2) Define basics of information and communication technology (ICT)	ARC416C(Urban Design), ELE021(Computer and Programming),
	A3) Define characteristics of engineering materials related to the discipline.	ARC 202(Working Design (1)), ARC222(Interior Design), ARC 302(Working Design (2)), ARC321(Quantities & Specifications), CVE227(Soil Mechanics and foundations), BES012(Physics (1-A)), BES022(Physics (1-B)), BES013(Chemistry), BES014(History of Eng- Sciences), PRE021(Production Engineering)
	A4) Explain principles of design including elements design, process and/or a system related to specific disciplines.	ARC111(Visual Training), ARC113 (Sciagraphy& Perspective (A)), ARC 203(History and Theories of Planning), ARC201 (Architecture Design (2)), ARC 211 (History and Theories of Architecture (2)), ARC222 (Interior Design), ARC 323 (Urban and Environmental Conservation), ARC303 (Urban Planning), ARC324D(Aesthetics and Form), ARC415A (Architectural Design (4)), ARC415C(Planning Project), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures), PRE001(Engineering Drawing & Projection)
	A5) Explain methodologies of solving engineering problems, data collection and interpretation	ARC 303(Urban Planning), ARC415A (Architectural Design (4)), ARC 113 (Sciagraphy & Perspective (A)), ARC416C(Urban Design), ARC 201(Architecture Design (2)), ARC413(Housing and Population Studies), ARC415C(Urban Design), ARC421B(Theories of Housing (4)), CVE227(Soil Mechanics and foundations),CVE328(Steel Structures), BES011(Mathematics (1-A)), BES021(Mathematics (1-B)), BES013(Chemistry)
	A6) Explain quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.	ARC 203(History and Theories of Planning), ARC415A (Architectural Design (4)), ARC426(Tender Documents, Building Laws and Legislations), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures),

Intended Learning Outcomes (ILOs) of the program			Courses that assess in realizing ILOs
		A7) Define business and management principles relevant to engineering.	ARC 203(History and Theories of Planning), ARC415C(Planning Projects), ARC426(Tender Documents, Building Laws and Legislations)
		A8) Explain current engineering tech. As related to disciplines.	ARC 202(Working Design (1)), ARC 301 (Architectural Design (3)), ARC 302(Working Design (2)), ARC 129(Building Construction), ARC102(Building Construction), ARC212(Technical Installations), BES014(History of Eng- Sciences), PRE021(Production Engineering)
		A9) Integrate topics related to humanitarian interests and moral issues.	ARC 203(History and Theories of Planning), ARC 303(Urban Planning), ARC412(Regional Planning), ARC416C(Urban Design), ARC416A(Contemporary Architecture and Heritage), ARC 301 (Architectural Design (3)), ARC 211(History and Theories of Architecture (2)), ARC413(Housing and Population Studies), ARC415C(Planning Projects), ARC421A(Philosophy of Architecture), ARC421B(Theories of Housing (4)), ARC422(Practicing the profession) , ARC423(Industrial Sociology Science), ELE021(Computer and Programming), BES014(History of Eng- Sciences), BES004(English Language)
		A10) Demonstrate abilities for technical language and report writing.	ARC 203(History and Theories of Planning), ARC 303(Urban Planning), ARC412(Regional Planning), ARC415C(Planning Projects), ARC426(Tender Documents, Building Laws and Legislations), BES004(English Language)
		A11) Define professional ethics and impacts of engineering solutions on society and environment	ARC 203(History and Theories of Planning), ARC416B (Housing Economics), ARC412(Regional Planning), ARC415C(Planning Projects), ARC416C(Urban Design), ARC416A(Contemporary Architecture and Heritage), ARC 314(History and Theories of Architecture (3)), ARC421B(Theories of Housing (4)),
		A12) Explain contemporary engineering topics.	ARC416A(Contemporary Architecture and Heritage), ARC421A(Philosophy of Architecture)
	Arch. Engineering	A13) Explain principles of architectural design, and the preparation and presentations of design projects in a variety of contexts, scales, types and degree of complexity.	ARC 203(History and Theories of Planning), ARC415A (Architectural Design (4)), ARC 113 (Sciagraphy & Perspective (A)), ARC 121( Sciagraphy & Perspective (B)), ARC 201(Architecture Design (2)), ARC 301 (Architectural Design (3)), ARC 414(Landscape Design),
		A14) Explain principles of building technologies, structure & construction methods, technical installations, properties of materials, and the way they may influence design decisions.	ARC416B (Housing Economics), ARC 202(Working Design (1)), ARC 301 (Architectural Design (3)), ARC 302(Working Design (2)), ARC 129(Building Construction), ARC102(Building Construction), ARC421A(Philosophy of Architecture), ARC212(Technical Installations)
		A15) Remember fundamentals of building acquisition, operational costs, and of preparing construction documents and specifications of materials, components, and systems appropriate to the building.	ARC 202(Working Design (1)), ARC 302(Working Design (2)), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures), ARC212(Technical Installations)

Intended Learning Outcomes (ILOs) of the program			Courses that assess in realizing ILOs
		A16) Demonstrate theories and legislations of urban and regional planning.	ARC 203(History and Theories of Planning), ARC 303(Urban Planning), ARC412(Regional Planning), ARC415C(Planning Projects), ARC416C(Urban Design),
		A17) Explain the processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.	ARC 203(History and Theories of Planning), ARC 323(Urban and Environmental Conservation), ARC324D(Aesthetics and Form), ARC412(Regional Planning), ARC415C(Planning Projects), ARC416C(Urban Design),
Intellectual Skills	Engineering	B1) Describe appropriate mathematical and computer-based methods for modelling and analysing problems.	ARC 303(Urban Planning), BES021(Mathematics (1-B)), ELE021(Computer and Programming), ARC303(Urban Planning), ARC324A (Interior Design), CVE127(Theory of structures (1))
		B2) Use appropriate solutions for engineering problems based on analytical thinking.	ARC 323(Urban and Environmental Conservation), ARC 303(Urban Planning), ARC 113 (Sciagraphy & Perspective (A)), ARC324D(Aesthetics and Form), ARC415C(Planning Projects), ARC421B(Theories of Housing (4)), ARC426(Tender Documents, Building Laws and Legislations), BES012(Physics (1-A)), BES022(Physics (1-B)), BES003(Mechanics ), BES013(Chemistry), BES014(History of Eng- Sciences)
		B3) Prove thinking in a creative and innovative way in problem solving and design.	ARC 111(Visual Training), ARC 303(Urban Planning), ARC415A (Architectural Design (4)), ARC415C(Planning Projects), ARC 113 (Sciagraphy & Perspective (A)), ARC 121( Sciagraphy & Perspective (B)) ,ARC416C(Urban Design), ARC 201(Architecture Design (2)), ARC 129(Building Construction), ARC413(Housing and Population Studies), BES011(Mathematics (1-A)), BES021(Mathematics (1-B)), BES012(Physics (1-A)), BES022(Physics (1-B)), BES003(Mechanics ), PRE001(Engineering Drawing & Projection), PRE021(Production Engineering)
		B4) Show abilities to combine, exchange, and assess different ideas, views, and knowledge from a range of sources.	ARC415A (Architectural Design (4)), ARC412(Regional Planning), ARC416C(Urban Design), ARC102(Building Construction), ARC423(Industrial Sociology Science), ARC421A(Philosophy of Architecture), ARC413(Housing and Population Studies), BES004(English Language)
		B5) Demonstrate how to assess and evaluate the characteristics and performance of components, systems and processes.	ARC 323(Urban and Environmental Conservation), ARC 303(Urban Planning), ARC412(Regional Planning), ARC415C(Planning Projects), ARC416C(Urban Design), ARC 314(History and Theories of Architecture (3)), ARC324D(Aesthetics and Form), ARC 211(History and Theories of Architecture (2)), ARC421B(Theories of Housing (4)), ARC321(Quantities & Specifications), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures), CVE227(Soil Mechanics and foundations), ARC222(Interior Design)
		B6) Conduct an investigation of the failure of components, systems, and processes.	ARC 323(Urban and Environmental Conservation), ARC421B(Theories of Housing (4)), ARC324D(Aesthetics and Form), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures),

Intended Learning Outcomes (ILOs) of the program			Courses that assess in realizing ILOs
Arch. Engineering		B7) Prove the ability to solve engineering problems, often on the basis of limited and possibly contradicting information.	ARC 203(History and Theories of Planning), ARC416B (Housing Economics), ARC415A (Architectural Design (4))
		B8) Show skills for selecting and appraising appropriate ICT tools to a variety of engineering problems.	ARC412(Regional Planning), ARC416C(Urban Design), ARC422(Practicing the profession), ELE021(Computer and Programming),
		B9) Prove the ability to judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.	ARC416B (Housing Economics), ARC 202(Working Design (1)), ARC 302(Working Design (2)), ARC421B(Theories of Housing (4)), ARC212(Technical Installations), BES013(Chemistry)
		B10) Demonstrate the ability to incorporate economic, societal, environmental dimensions and risk management in design.	ARC 203(History and Theories of Planning), ARC 303(Urban Planning), ARC412(Regional Planning), ARC415C(Planning Projects), ARC416C(Urban Design),
		B11) Prove the ability to analyse results of numerical models and assess their limitations.	ARC 303(Urban Planning), ARC412(Regional Planning), ARC 129(Building Construction), ARC426(Tender Documents, Building Laws and Legislations)
		B12) Demonstrate the skills needed for creating systematic and methodical approaches when dealing with new and advancing technology.	ARC324B (Building Technology and Modern Construction Systems), CVE117(Strength & Properties of Materials (1))
	Arch. Engineering	B13) Develop integrates different forms of knowledge, ideas from other disciplines, and manages information retrieval to create new solutions.	ARC 203(History and Theories of Planning), ARC 323(Urban and Environmental Conservation), ARC412(Regional Planning), ARC415C(Planning Projects), ARC416C(Urban Design), ARC324D(Aesthetics and Form), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures),
		B14) Produce three-dimensionally and engage images of places & times with innovation and creativity in the exploration of design.	ARC 111(Visual Training), ARC 113 (Sciagraphy & Perspective (A)), ARC 121( Sciagraphy & Perspective (B)), ARC416C(Urban Design)
		B15) Predict possible consequences, by- products and assess expected performance of design alternatives.	ARC 203(History and Theories of Planning), ARC 323(Urban and Environmental Conservation), ARC 303(Urban Planning), ARC412(Regional Planning), ARC415C(Planning Projects), ARC423(Industrial Sociology Science), ARC421A(Philosophy of Architecture), ARC324D(Aesthetics and Form)
		B16) The ability to reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.	ARC 203(History and Theories of Planning), ARC 323(Urban and Environmental Conservation), ARC412(Regional Planning), ARC 301 (Architectural Design (3)), ARC324D(Aesthetics and Form),
		B17) The ability to integrate relationship of structure, building materials, and construction elements into design process.	ARC 323(Urban and Environmental Conservation), ARC416B (Housing Economics), ARC 202(Working Design (1)), ARC 301 (Architectural Design (3)), ARC 302(Working Design (2)), ARC 129(Building Construction), ARC102(Building Construction), ARC212(Technical Installations)
		B18) The ability to integrate community design parameters into design projects.	ARC 203(History and Theories of Planning), ARC415C(Planning Projects), ARC416C(Urban Design), ARC426(Tender Documents, Building Laws and Legislations)

Intended Learning Outcomes (ILOs) of the program		Courses that assess in realizing ILOs
	B19) The ability to appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.	ARC 203(History and Theories of Planning), ARC415C(Planning Projects), ARC416C(Urban Design), ARC416A(Contemporary Architecture and Heritage), ARC 414(Landscape Design),
	B20) The ability to discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession and practice.	ARC415A (Architectural Design (4)), ARC416C(Urban Design), ARC416A(Contemporary Architecture and Heritage),
	B21) Explain the analyses the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.	ARC416A(Contemporary Architecture and Heritage), ARC 314(History and Theories of Architecture (3)), ARC 201(Architecture Design (2)), ARC 211(History and Theories of Architecture (2)),
	C1) Show the ability to apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	ARC 323(Urban and Environmental Conservation), ARC 303(Urban Planning), ARC415A (Architectural Design (4)), ARC 113 (Sciagraphy & Perspective (A)), ARC 121( Sciagraphy & Perspective (B)), ARC 129(Building Construction), ARC324D(Aesthetics and Form), ARC222(Interior Design), ELE021(Computer and Programming), BES011(Mathematics (1-A)), BES021(Mathematics (1-B)), BES003(Mechanics ), PRE021(Production Engineering)
	C2) Demonstrate the skills for professionally merging the engineering knowledge, understanding, and feedback to improve design, products and/or services.	ARC 203(History and Theories of Planning), ARC 303(Urban Planning), ARC416B (Housing Economics), ARC 202(Working Design (1)), ARC416C(Urban Design), ARC 314(History and Theories of Architecture (3)), ARC 211(History and Theories of Architecture (2)), ARC 302(Working Design (2)), ARC415C(Planning Projects), ARC222(Interior Design), ARC212(Technical Installations), BES012(Physics (1-A)), BES022(Physics (1-B))
	C3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.	ARC416C(Urban Design), ARC415C(Planning Projects), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures),
	C4) Develop the practice the neatness and aesthetics in design and approach.	ARC 111(Visual Training), ARC416B (Housing Economics), ARC415A (Architectural Design (4)), ARC 113 (Sciagraphy & Perspective (A)), ARC 121( Sciagraphy & Perspective (B)) ARC416C(Urban Design), ARC 314(History and Theories of Architecture (3)), ARC 211(History and Theories of Architecture (2)), ARC 414(Landscape Design), ARC222(Interior Design)
	C5) Show the ability to use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results.	ARC 303(Urban Planning), ARC412(Regional Planning), ARC416C(Urban Design), ARC415C(Planning Projects), CVE227(Soil Mechanics and foundations), BES013(Chemistry)
	C6) Prove the ability to use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.	ARC 203(History and Theories of Planning), ARC412(Regional Planning), ELE021(Computer and Programming),

Intended Learning Outcomes (ILOs) of the program			Courses that assess in realizing ILOs
Arch. Engineering		C7) Demonstrate the ability to apply numerical modelling methods to engineering problems.	ARC 303(Urban Planning), ARC412(Regional Planning), ARC426(Tender Documents, Building Laws and Legislations), ELE021(Computer and Programming)
		C8) Demonstrate the ability to apply safe systems at work and observe the appropriate steps to manage risks.	BES013(Chemistry), PRE021(Production Engineering)
		C9) Prove the skills needed for basic organizational and project management skills.	ARC 203(History and Theories of Planning), ARC 303(Urban Planning), ARC421A(Philosophy of Architecture), ARC415C(Planning Projects)
		C10) Show skills for quality assurance procedures and follow codes and standards.	ARC321(Quantities & Specifications), ARC426(Tender Documents, Building Laws and Legislations), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures).
		C11) Indicate the talent to exchange knowledge and skills with engineering community and industry.	ARC321(Quantities & Specifications), ARC 323(Urban and Environmental Conservation), ARC423(Industrial Sociology Science), ARC422(Practicing the profession), ARC324D(Aesthetics and Form), ARC413(Housing and Population Studies), PRE021(Production Engineering)
		C12) Prove the competences to prepare and present technical reports.	ARC 203(History and Theories of Planning), ARC 323(Urban and Environmental Conservation), ARC 303(Urban Planning), ARC412(Regional Planning), ARC416C(Urban Design), ARC421B(Theories of Housing (4)), ARC426(Tender Documents, Building Laws and Legislations), ARC422(Practicing the profession), ARC415C(Planning Projects), ARC324D(Aesthetics and Form), BES013(Chemistry), PRE001(Engineering Drawing & Projection), BES014(History of Eng- Sciences), BES004(English Language)
		C13) Produce and present architectural, urban design, and planning projects using an appropriate range of media and design-based software.	ARC416C(Urban Design), ARC 201(Architecture Design (2)), ARC 301 (Architectural Design (3)), ARC 414(Landscape Design), ARC422(Practicing the profession)
		C14) Produce professional workshop and technical drawings using traditional drawing and computer-aided drawings' techniques.	ARC 202(Working Design (1)), ARC 113 (Sciagraphy & Perspective (A)), ARC412(Regional Planning), ARC416C(Urban Design), ARC 302(Working Design (2)), ARC222(Interior Design), ARC212(Technical Installations)
		C15) Use appropriate construction techniques and materials to specify and implement different designs.	ARC 202(Working Design (1)), ARC 302(Working Design (2)), ARC 129(Building Construction), ARC102(Building Construction), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures), ARC212(Technical Installations)
		C16) Participate professionally in managing construction processes.	ARC415C(Planning Projects), ARC416B (Housing Economics), ARC424(Project Management), ARC425( Project )
		C17) Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.	ARC 203(History and Theories of Planning), ARC 323(Urban and Environmental Conservation), ARC415A (Architectural Design (4)), ARC416C(Urban Design), ARC 301 (Architectural Design (3)), ARC421B(Theories of Housing (4)), ARC 129(Building Construction), ARC415C(Planning Projects), ARC324D(Aesthetics and Form),

Intended Learning Outcomes (ILOs) of the program			Courses that assess in realizing ILOs
		C18) Display imagination and creativity.	ARC 111(Visual Training), ARC 113 (Sciagraphy & Perspective (A)), ARC 121( Sciagraphy & Perspective (B)), ARC416C(Urban Design), ARC 414(Landscape Design),
		C19) Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.	ARC415A (Architectural Design (4)), ARC412(Regional Planning), ARC416C(Urban Design), ARC 201(Architecture Design (2)), ARC423(Industrial Sociology Science), ARC421A(Philosophy of Architecture), ARC413(Housing and Population Studies)
		C20) Provide leadership and education to the client particularly with reference to sustainable design principles.	ARC412(Regional Planning),
		C21) Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.	ARC412(Regional Planning), ARC415C(Planning Projects), ARC416C(Urban Design), ARC416A(Contemporary Architecture and Heritage),
		C22) Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.	ARC 323(Urban and Environmental Conservation), ARC415C(Planning Projects), ARC416C(Urban Design), ARC416A(Contemporary Architecture and Heritage), ARC324D(Aesthetics and Form),
General Skills		D1) Demonstrate the ability for collaborating effectively within multidisciplinary team.	ARC416B (Housing Economics), ARC415A (Architectural Design (4)), ARC412(Regional Planning), ARC416C(Urban Design), ARC416A(Contemporary Architecture and Heritage), ARC 314(History and Theories of Architecture (3)), ARC321(Quantities & Specifications), ARC 211(History and Theories of Architecture (2)), ARC415C(Planning Projects), ARC421B(Theories of Housing (4)), ARC102(Building Construction), ARC422(Practicing the profession), ARC421A(Philosophy of Architecture), CVE227(Soil Mechanics and foundations), ARC413(Housing and Population Studies), ARC222(Interior Design)
		D2) Prove the capacity to work in stressful environment and within constraints.	ARC 203(History and Theories of Planning), ARC 323(Urban and Environmental Conservation), ARC 303(Urban Planning), ARC 202(Working Design (1)), ARC 113 (Sciagraphy & Perspective (A)), ARC 121( Sciagraphy & Perspective (B)), ARC412(Regional Planning), ARC416C(Urban Design), ARC 201(Architecture Design (2)), ARC 301 (Architectural Design (3)), ARC 302(Working Design (2)), ARC415C(Planning Projects), ARC426(Tender Documents, Building Laws and Legislations), ARC423(Industrial Sociology Science), ARC324D(Aesthetics and Form), PRE021(Production Engineering)

Intended Learning Outcomes (ILOs) of the program		Courses that assess in realizing ILOs
	D3) Demonstrate the ability to communicate effectively.	ARC 111(Visual Training), ARC 323(Urban and Environmental Conservation), ARC 303(Urban Planning), ARC321(Quantities & Specifications), ARC415A (Architectural Design (4)), ARC415C(Planning Projects), ARC412(Regional Planning), ARC416C(Urban Design), ARC421B(Theories of Housing (4)), ARC422(Practicing the profession), ARC324D(Aesthetics and Form), BES012(Physics (1-A)), BES022(Physics (1-B)), BES003(Mechanics ), PRE001(Engineering Drawing & Projection), BES004(English Language)
	D4) Establish skills for efficient and effective use of IT capabilities.	ARC 303(Urban Planning), ARC415A (Architectural Design (4)), ARC412(Regional Planning), ARC415C(Planning Projects), ARC416C(Urban Design), ELE021(Computer and Programming),
	D5) Demonstrate the ability to lead and motivate individuals.	ARC412(Regional Planning), ARC416C(Urban Design), ARC 201(Architecture Design (2)), ARC415C(Planning Projects), ARC426(Tender Documents, Building Laws and Legislations)
	D6) Prove the capability for effectively managing tasks, time, and resources.	ARC 203(History and Theories of Planning), ARC 323(Urban and Environmental Conservation), ARC416B (Housing Economics), ARC 202(Working Design (1)), ARC 113 (Sciagraphy & Perspective (A)), ARC 121( Sciagraphy & Perspective (B)) ARC412(Regional Planning), ARC416C(Urban Design), ARC 302(Working Design (2)), ARC 129(Building Construction), ARC415C(Planning Projects), ARC324D(Aesthetics and Form), ARC212(Technical Installations)
	D7) Prove the skills for searching for information and engage in life-long self-learning discipline.	ARC 111(Visual Training), ARC 323(Urban and Environmental Conservation), ARC 202(Working Design (1)), ARC412(Regional Planning), ARC416C(Urban Design), ARC416A(Contemporary Architecture and Heritage), ARC 314(History and Theories of Architecture (3)), ARC 211(History and Theories of Architecture (2)), ARC 302(Working Design (2)), ARC421B(Theories of Housing (4)), ARC 129 (Building Construction), ARC102(Building Construction), ARC 414(Landscape Design), ARC426(Tender Documents, Building Laws and Legislations), ARC423(Industrial Sociology Science), ARC421A(Philosophy of Architecture), ARC415C(Planning Projects), ARC324D(Aesthetics and Form), CVE317(Reinforced Concrete Structure), CVE328(Steel Structures), CVE227(Soil Mechanics and foundations), ARC413(Housing and Population Studies), ARC222(Interior Design), ARC212(Technical Installations)
	D8) Demonstrate that entrepreneurial skills are acquired	ARC415A (Architectural Design (4)), ARC412(Regional Planning), ARC416C(Urban Design),



Intended Learning Outcomes (ILOs) of the program		Courses that assess in realizing ILOs
	D9) Show the ability to refer to relevant literatures.	ARC 203(History and Theories of Planning), ARC412(Regional Planning), ARC416C(Urban Design), ARC 414(Landscape Design), ARC415C(Planning Projects), BES011(Mathematics (1-A)), BES021(Mathematics (1-B)), BES013(Chemistry), BES014(History of Eng- Sciences), BES004(English Language)

## 2.6 Teaching and Learning Methods

Intended Learning Outcomes (ILOs) of the program		Teaching and Learning Methods													
		Lecture	Presentations and Movies	Discussions	Tutorials	Lab Experiments	Problem solving	Brain storming	Projects	Site visits	Research and Reporting	Grope Working	Discovering	Simulation and Modeling	Role playing
Knowledge and Understanding	By the end of the program, student should be able to:														
	Engineering	A1) Explain concepts and theories of mathematics and sciences, appropriate to the discipline.	■			■	■					■			
		A2) Define basics of information and communication technology (ICT)	■			■	■					■			
		A3) Define characteristics of engineering materials related to the discipline.	■			■	■	■				■			
		A4) Explain principles of design including elements design, process and/or a system related to specific disciplines.	■		■			■		■		■			
		A5) Explain methodologies of solving engineering problems, data collection and interpretation	■					■		■		■			
		A6) Explain quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.	■	■		■		■			■	■			
		A7) Define business and management principles relevant to engineering.	■		■							■			■
		A8) Explain current engineering tech. As related to disciplines.	■			■				■	■	■			
		A9) Integrate topics related to humanitarian interests and moral issues.	■		■				■						
		A10) Demonstrate abilities for technical language and report writing.	■						■			■			
		A11) Define professional ethics and impacts of engineering solutions on society and environment	■		■				■			■			
		A12) Explain contemporary engineering topics.	■	■	■				■			■			
	Arch. Eng.	A13) Explain principles of architectural design, and the preparation and presentations of design projects in a variety of contexts, scales, types and degree of complexity.	■	■	■	■		■		■		■	■		■
		A14) Explain principles of building technologies, structure & construction methods, technical installations, properties of materials, and the way they may influence design decisions.	■	■	■	■		■		■	■	■			■

Intended Learning Outcomes (ILOs) of the program			Teaching and Learning Methods													
			Lecture	Presentations and Movies	Discussions	Tutorials	Lab Experiments	Problem solving	Brain storming	Projects	Site visits	Research and Reporting	Grope Working	Discovering	Simulation and Modeling	Role playing
		A15) Remember fundamentals of building acquisition, operational costs, and of preparing construction documents and specifications of materials, components, and systems appropriate to the building.	■	■	■	■		■		■			■			
		A16) Demonstrate theories and legislations of urban and regional planning.	■			■				■			■			
		A17) Explain the processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.	■	■	■					■			■			
Intellectual Skills Engineering		B1) Describe appropriate mathematical and computer-based methods for modelling and analysing problems.	■			■		■						■		
		B2) Use appropriate solutions for engineering problems based on analytical thinking.	■		■	■		■		■		■				
		B3) Prove thinking in a creative and innovative way in problem solving and design.			■	■		■		■		■	■	■	■	
		B4) Show abilities to combine, exchange, and assess different ideas, views, and knowledge from a range of sources.	■		■	■		■	■	■		■	■			
		B5) Demonstrate how to assess and evaluate the characteristics and performance of components, systems and processes.	■		■	■						■				
		B6) Conduct an investigation of the failure of components, systems, and processes.	■		■	■		■	■		■	■	■			
		B7) Prove the ability to solve engineering problems, often on the basis of limited and possibly contradicting information.	■			■		■	■			■				
		B8) Show skills for selecting and appraising appropriate ICT tools to a variety of engineering problems.	■		■	■		■								
		B9) Prove the ability to judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.	■			■			■	■		■				
		B10) Demonstrate the ability to incorporate economic, societal, environmental dimensions and risk management in design.	■	■	■	■				■		■	■			
		B11) Prove the ability to analyse results of numerical models and assess their limitations.	■			■							■			

Intended Learning Outcomes (ILOs) of the program			Teaching and Learning Methods													
			Lecture	Presentations and Movies	Discussions	Tutorials	Lab Experiments	Problem solving	Brain storming	Projects	Site visits	Research and Reporting	Grope Working	Discovering	Simulation and Modeling	Role playing
Arch. Eng.		B12) Demonstrate the skills needed for creating systematic and methodical approaches when dealing with new and advancing technology.			■				■	■			■			
		B13) Develop integrates different forms of knowledge, ideas from other disciplines, and manages information retrieval to create new solutions.			■	■		■	■					■		
		B14) Produce three-dimensionally and engage images of places & times with innovation and creativity in the exploration of design.					■	■	■					■	■	
		B15) Predict possible consequences, by-products and assess expected performance of design alternatives.			■	■		■	■	■					■	
		B16) The ability to reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.			■	■		■	■	■		■				
		B17) The ability to integrate relationship of structure, building materials, and construction elements into design process.		■	■	■		■		■	■	■				
		B18) The ability to integrate community design parameters into design projects.		■	■	■		■		■		■				
		B19) The ability to appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.			■	■				■	■				■	
		B20) The ability to discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession and practice.			■	■		■	■			■	■			
		B21) Explain the analyses the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.			■	■			■	■		■				
Professional Skills	Engineering	C1) Show the ability to apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	■				■			■				■	■	
		C2) Demonstrate the skills for professionally merging the engineering knowledge, understanding, and feedback to improve design, products and/or services.	■		■	■				■	■	■				

Intended Learning Outcomes (ILOs) of the program			Teaching and Learning Methods													
			Lecture	Presentations and Movies	Discussions	Tutorials	Lab Experiments	Problem solving	Brain storming	Projects	Site visits	Research and Reporting	Group Working	Discovering	Simulation and Modeling	Role playing
		C3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.	■						■		■	■				
		C4) Develop the practice the neatness and aesthetics in design and approach.	■		■					■		■			■	
		C5) Show the ability to use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results.	■			■	■	■		■		■				
		C6) Prove the ability to use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.	■			■			■	■		■				
		C7) Demonstrate the ability to apply numerical modelling methods to engineering problems.	■			■				■					■	
		C8) Demonstrate the ability to apply safe systems at work and observe the appropriate steps to manage risks.	■							■		■				
		C9) Prove the skills needed for basic organizational and project management skills.	■		■					■			■			
		C10) Show skills for quality assurance procedures and follow codes and standards.	■							■		■				
		C11) Indicate the talent to exchange knowledge and skills with engineering community and industry.	■		■					■	■		■			
		C12) Prove the competences to prepare and present technical reports.	■	■		■				■	■	■				
Arch. Eng.		C13) Produce and present architectural, urban design, and planning projects using an appropriate range of media and design-based software.		■	■	■			■	■		■			■	
		C14) Produce professional workshop and technical drawings using traditional drawing and computer-aided drawings' techniques.		■		■	■			■						
		C15) Use appropriate construction techniques and materials to specify and implement different designs.	■	■		■	■		■	■		■				
		C16) Participate professionally in managing construction processes.	■		■						■		■			

Intended Learning Outcomes (ILOs) of the program			Teaching and Learning Methods													
			Lecture	Presentations and Movies	Discussions	Tutorials	Lab Experiments	Problem solving	Brain storming	Projects	Site visits	Research and Reporting	Grope Working	Discovering	Simulation and Modeling	Role playing
		C17) Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.	■		■	■		■	■	■	■	■				
		C18) Display imagination and creativity.	■	■	■	■		■	■	■		■				■
		C19) Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.	■	■	■	■		■	■	■		■			■	■
		C20) Provide leadership and education to the client particularly with reference to sustainable design principles.	■	■	■	■		■	■	■		■				■
		C21) Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.	■	■	■	■		■	■	■	■	■	■			
		C22) Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.	■	■	■	■				■		■			■	
General Skills		D1) Demonstrate the ability for collaborating effectively within multidisciplinary team.		■	■	■		■	■	■			■			
		D2) Prove the capacity to work in stressful environment and within constraints.			■	■				■			■			
		D3) Demonstrate the ability to communicate effectively.			■					■	■	■				■
		D4) Establish skills for efficient and effective use of IT capabilities.		■		■				■		■				
		D5) Demonstrate the ability to lead and motivate individuals.			■			■	■	■	■		■			
		D6) Prove the capability for effectively managing tasks, time, and resources.		■	■					■						
		D7) Prove the skills for searching for information and engage in life-long self-learning discipline.						■		■	■	■				
		D8) Demonstrate that entrepreneurial skills are acquired.	■					■	■	■	■	■	■			
		D9) Show the ability to refer to relevant literatures.								■	■	■				

## 2.7 Assessment Methods

Intended Learning Outcomes (ILOs) of the program			Assessment methods											
			Written Exam	Oral Exam	Tutorial assessment	Project assessment	Model assessment	Report assessment	Quiz assessment	Decision discussion	Discussion	Laboratory test	Take Home Exam	Notice
Knowledge and Understanding	By the end of the program, student should be able to:													
	Engineering	A1) Explain concepts and theories of mathematics and sciences, appropriate to the discipline.	■		■									
		A2) Define basics of information and communication technology (ICT)	■		■						■			
		A3) Define characteristics of engineering materials related to the discipline.	■		■						■			
		A4) Explain principles of design including elements design, process and/or a system related to specific disciplines.	■	■	■	■		■	■			■		
		A5) Explain methodologies of solving engineering problems, data collection and interpretation	■	■	■	■	■				■			
		A6) Explain quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.	■		■			■	■					
		A7) Define business and management principles relevant to engineering.	■					■						
		A8) Explain current engineering tech. As related to disciplines.	■	■		■	■	■			■			
		A9) Integrate topics related to humanitarian interests and moral issues.	■	■				■			■			
		A10) Demonstrate abilities for technical language and report writing.	■					■						
		A11) Define professional ethics and impacts of engineering solutions on society and environment	■	■				■			■		■	
		A12) Explain contemporary engineering topics.	■	■				■		■	■		■	
	Arch. Eng.	A13) Explain principles of architectural design, and the preparation and presentations of design projects in a variety of contexts, scales, types and degree of complexity.	■	■	■	■	■	■	■		■			
		A14) Explain principles of building technologies, structure & construction methods, technical installations, properties of materials, and the way they may influence design decisions.	■	■	■	■	■	■	■	■	■	■		
		A15) Remember fundamentals of building acquisition, operational costs, and of preparing construction documents and specifications of materials, components, and systems appropriate to the building.	■	■	■	■	■	■			■			
		A16) Demonstrate theories and legislations of urban and regional planning.	■	■	■	■		■			■			
A17) Explain the processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.		■	■		■		■			■				

Intended Learning Outcomes (ILOs) of the program		Assessment methods									
		Written Exam	Oral Exam	Tutorial assessment	Project assessment	Model assessment	Report assessment	Quiz assessment	Discussion	Laboratory test	Take Home Exam
Intellectual Skills	Engineering	B1) Describe appropriate mathematical and computer-based methods for modelling and analysing problems.	■	■			■				
		B2) Use appropriate solutions for engineering problems based on analytical thinking.	■	■	■		■		■		
		B3) Prove thinking in a creative and innovative way in problem solving and design.		■	■	■	■	■	■		
		B4) Show abilities to combine, exchange, and assess different ideas, views, and knowledge from a range of sources.	■	■	■		■	■	■		
		B5) Demonstrate how to assess and evaluate the characteristics and performance of components, systems and processes.	■		■		■		■		
		B6) Conduct an investigation of the failure of components, systems, and processes.	■	■			■		■		
		B7) Prove the ability to solve engineering problems, often on the basis of limited and possibly contradicting information.	■	■	■		■				■
		B8) Show skills for selecting and appraising appropriate ICT tools to a variety of engineering problems.	■	■			■	■			
		B9) Prove the ability to judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.	■		■		■	■	■		■
		B10) Demonstrate the ability to incorporate economic, societal, environmental dimensions and risk management in design.	■		■		■	■	■		■
		B11) Prove the ability to analyse results of numerical models and assess their limitations.	■	■			■				
		B12) Demonstrate the skills needed for creating systematic and methodical approaches when dealing with new and advancing technology.			■		■		■	■	
	Arch. Eng.	B13) Develop integrates different forms of knowledge, ideas from other disciplines, and manages information retrieval to create new solutions.	■	■	■	■		■	■		
		B14) Produce three-dimensionally and engage images of places & times with innovation and creativity in the exploration of design.	■	■	■	■		■			■
		B15) Predict possible consequences, by- products and assess expected performance of design alternatives.	■	■	■	■	■	■	■		■
		B16) The ability to reconcile conflicting objectives and manage the broad constituency of interests to reach optimum solutions.	■	■	■		■	■	■		■
		B17) The ability to integrate relationship of structure, building materials, and construction elements into design process.	■	■	■	■	■	■	■		■



Intended Learning Outcomes (ILOs) of the program			Assessment methods											
			Written Exam	Oral Exam	Tutorial assessment	Project assessment	Model assessment	Report assessment	Quiz assessment	Practical discussion	Discussion	Laboratory test	Take Home Exam	Notice
		B18) The ability to integrate community design parameters into design projects.	■	■	■	■		■	■				■	
		B19) The ability to appraise the spatial, aesthetic, technical and social qualities of a design within the scope and scale of a wider environment.	■	■	■	■	■	■		■				
		B20) The ability to discuss, search and formulate informed opinions appropriate to specific context and circumstances affecting architecture profession and practice.	■	■	■			■		■				
		B21) Explain the analyses the range of patterns and traditions that have shaped and sustained cultures and the way that they can inform design process.	■	■	■	■		■		■				
Professional Skills Engineering		C1) Show the ability to apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	■		■	■		■		■		■		
		C2) Demonstrate the skills for professionally merging the engineering knowledge, understanding, and feedback to improve design, products and/or services.	■		■	■		■		■			■	
		C3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.	■		■	■		■		■			■	■
		C4) Develop the practice the neatness and aesthetics in design and approach.	■		■	■	■	■		■			■	■
		C5) Show the ability to use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results.	■		■	■		■		■		■	■	
		C6) Prove the ability to use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.	■		■	■	■		■	■		■	■	■
		C7) Demonstrate the ability to apply numerical modelling methods to engineering problems.	■		■	■		■	■					
		C8) Demonstrate the ability to apply safe systems at work and observe the appropriate steps to manage risks.				■		■		■			■	
		C9) Prove the skills needed for basic organizational and project management skills.	■			■		■			■			■
		C10) Show skills for quality assurance procedures and follow codes and standards.	■		■	■		■					■	
		C11) Indicate the talent to exchange knowledge and skills with engineering community and industry.		■		■		■			■		■	
		C12) Prove the competences to prepare and present technical reports.				■		■		■			■	

Intended Learning Outcomes (ILOs) of the program		Assessment methods											
		Written Exam	Oral Exam	Tutorial assessment	Project assessment	Model assessment	Report assessment	Quiz assessment	Directed discussion	Discussion	Laboratory test	Take Home Exam	Notice
Arch. Eng.	C13) Produce and present architectural, urban design, and planning projects using an appropriate range of media and design-based software.	■	■	■	■	■	■	■	■	■		■	■
	C14) Produce professional workshop and technical drawings using traditional drawing and computer-aided drawings' techniques.	■		■	■		■	■	■		■	■	■
	C15) Use appropriate construction techniques and materials to specify and implement different designs.	■	■	■	■		■			■			
	C16) Participate professionally in managing construction processes.	■	■				■			■			
	C17) Demonstrate professional competence in developing innovative and appropriate solutions of architectural and urban problems.	■		■	■	■	■	■		■		■	
	C18) Display imagination and creativity.	■		■	■	■	■	■		■		■	■
	C19) Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.	■		■	■	■	■	■		■		■	
	C20) Provide leadership and education to the client particularly with reference to sustainable design principles.	■	■	■	■	■	■	■		■		■	
	C21) Respond effectively to the broad constituency of interests with consideration of social and ethical concerns.	■	■	■	■	■	■	■		■		■	
	C22) Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.	■			■					■			
General Skills	D1) Demonstrate the ability for collaborating effectively within multidisciplinary team.			■	■	■		■		■			
	D2) Prove the capacity to work in stressful environment and within constraints.			■		■		■	■	■			■
	D3) Demonstrate the ability to communicate effectively.	■		■		■	■	■	■	■			■
	D4) Establish skills for efficient and effective use of IT capabilities.			■		■		■	■	■			■
	D5) Demonstrate the ability to lead and motivate individuals.			■				■	■	■			■
	D6) Prove the capability for effectively managing tasks, time, and resources.					■		■		■			
	D7) Prove the skills for searching for information and engage in life-long self-learning discipline.					■		■	■	■			
	D8) Demonstrate that entrepreneurial skills are acquired.					■		■		■			
	D9) Show the ability to refer to relevant literatures.					■		■					

### 3. Subject Area

#### 3.1 Mandatory + Elective Courses

Code	Course	Course 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 (Institution character-identifvne)	Total
		Lectures	Tutorials	Labs.								
BES 011	Mathematics (1-A)	4	2	-		6						6
BES 012	Physics (1-A)	3	-	2		3	1			1		5
BES 003	Mechanics	4	4	-		4	4					8
BES 013	Chemistry	2	-	2		0.8	0.8	1.6		0.8		4
PRE 001	Engineering Drawing & Projection	4	8	-		2	8			2		12
BES 014	History of Eng- Sciences	2	1	-	1.2		0.9				0.9	3
BES 004	English Language .	-	4	-	4							4
BES 021	Mathematics (1-B)	4	2	-		6						6
BES 022	Physics (1-B)	3	-	2		3	1			1		5
PRE 021	Production Engineering	2	-	2	1		1	1		1		4
ELE 021	Computer and Programming	2	-	1	1				1	1		3
ARC101	Architectural Design	2	10	-	2	2	2		3	3		12
ARC102	Building Construction	2	4	-		1.2	1.8	1.8		1.2		6
ARC111	Visual Training	3	3	-			3	3				6
ARC113	Sciagraphy & Perspective (A)	2	2	-			2	2				4
ARC121	Sciagraphy & Perspective (B)	2	2	-			2	2				4
ARC122	Architecture& Environmental Design Theories	2	-	-			0.4	1.6				2
ARC123	History and Theories of Architecture (1)	4	-	-	1.6		0.4	1.6			0.4	4
ARC124	Computer Aided Design 1	2	-	2		1	1		2			4
ARC129	Building Construction	2	4	-		1.2	1.8	1.8		1.2		6
ARC201	Architecture Design (2)	2	10	-		3	3	3		3		12
ARC202	Working Design (1)	2	10	-			3.6	2.4	3	3		12
ARC203	History and Theories of Planning	4	2	-	1	2	1	1			1	6
ARC211	History and Theories of Architecture (2)	4	-	-	1.6		0.4	1.6			0.4	4
ARC212	Technical Installations	4	2	-				1.8		1.8	2.4	6
ARC222	Interior Design	1	5	-	1.2			1.2	1.8	1.2	0.6	6
ARC223	Computer Applications (2)	2	-	2		1	0.2	0.6	1.6	0.6		4
ARC301	Architectural Design (3)	2	10	-	2	2		2	3	3		12
ARC302	Working Design (2)	4	8	-			3.6	2.4	3	3		12
ARC303	Urban Planning	4	8	-	2.4	1.2	0.6	4.2		2.4	1.2	12
ARC311	Building Economics	2	-	-	0.8	1				0.2		2
ARC314	History and Theories of Architecture (3)	4	-	-	1.6		0.4	1.6			0.4	4
ARC321	Quantities & Specifications	2	2	-	0.4	1.6	1.2	0.4		0.4		4
ARC323	Elective Course(1)	2	-	-	0.4	0.1	0.4	0.4		0.5	0.2	2
ARC324	Elective Course(2)	2	-	-	0.2	0.2	0.4	0.2	1			2
ARC411	Working Design (3)	1	7	-		1	2.4	1.6	2	1		8
ARC412	Regional Planning	2	4	-	0.3		1.5	1.2	1.2	0.6	1.2	6
ARC413	Housing and Population Studies	2	-	-	1.2	0.4					0.4	2
ARC414	Landscape Design	2	-	-			0.4	1.6				2

ARC415	Elective Course(3)	2	6	-	1.6	1.2	0.8	0.8	1.2	0.8	1.6	8
ARC416	Elective Course(4)	2	2	-	0.4	1.6	0.8	0.4			0.8	4
ARC421	Elective Course(5)	2	-	-	0.2		0.6	0.6			0.6	2
ARC422	Practicing the profession	2	-	-	2							2
ARC423	Industrial Sociology Science	2	-	-	2							2
ARC424	Project Management	4	-	-	0.4	1.6	0.4	1	0.6			4
ARC425	Project	2	14	-		4	1	1	4	2	4	16
ARC426	Tender Documents, Building Laws and Legislations	2	2	-	0.8	0.8		1.2		0.4	0.8	4
CVE117	Strength & Properties of Materials (1)	2	1	2		3	1	0.5	0.5			5
CVE118	Surveying	2	-	1			3					3
CVE127	Theory of structures (1)	2	2	-		0.4	0.4	3.2				4
CVE217	Theory of Structure (2)	4	2	-		1.2	0.6	3.6			0.6	6
CVE227	Soil Mechanics and foundations	2	1	1		0.8	0.4	2.4			0.4	4
CVE317	Reinforced Concrete Structure	4	2	-		2.4	0.6	2.4			0.6	6
CVE328	Steel Structures	2	2	-		0.8	0.4	2.4			0.4	4
<b>Summation of Each Branch Hours</b>					<b>31.3</b>	<b>61.5</b>	<b>60.2</b>	<b>63.1</b>	<b>28.9</b>	<b>36.1</b>	<b>18.9</b>	<b>300 Hours</b>
<b>% Percentage= (Total of Each Branch Hours/Total Hours)</b>					<b>10.4</b>	<b>20.5</b>	<b>20.1</b>	<b>21.0</b>	<b>9.6</b>	<b>12.0</b>	<b>6.3</b>	<b>100%</b>
<b>Tolerance (From NARS)</b>					<b>9-12</b>	<b>20-26</b>	<b>20-23</b>	<b>20-22</b>	<b>9-11</b>	<b>8-10</b>	<b>6-8</b>	

### 3.2Activities and additional courses

Code	Course/activity	A	B	C	D	E	F	G
		Humanities and Social Sciences (Univ. Req.)	Mathematics and Basic Sciences	Basic Engineering Sciences (Faculty/Spec. Req.)	Applied Engineering and Design	Computer Applications and ICT	Projects* and Practice	Discretionary (Institution character-identifying) subjects
BES000	Human Rights	2						
-----	ICDL					4		
-----	Summer Training						10	
-----	Bachelor trip							3
-----	Scientific Seminar			2				
-----	Other Activity							
	Total	2	---	2	---	4	10	3

#### 4. Program Structure

<b>Period of Study</b>	<b>5 Years</b>
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Program structure	Hours	283	Theoretical	17	Practical	300	Total
		272	Mandatory	28	Elective	21	Not bound
	Humanities and Social Sciences			عددالساعات	%	Tolerance (NARS)	
				31.3	10.4	9-12	
	Mathematics and Basic Sciences			عددالساعات	%	Tolerance (NARS)	
				61.5	20.5	20-26	
	Basic Engineering Sciences			عددالساعات	%	Tolerance (NARS)	
				60.2	20.1	20-23	
	Applied Engineering and Design			عددالساعات	%	Tolerance (NARS)	
				63.1	21	20-22	
	Computer Applications and ICT			عددالساعات	%	Tolerance (NARS)	
				28.9	9.6	9-11	
	Projects and Practice			عددالساعات	%	Tolerance (NARS)	
				36.1	12	8-10	
	Discretionary subjects			عددالساعات	%	Tolerance (NARS)	
				18.9	6.3	6-8	

Program Levels	Student should pass	توزيع الساعات		Total
		Mandatory	Elective	
	Preparatory year	60	--	60
	1 <sup>st</sup> year	60	--	60
	2 <sup>nd</sup> year	60	--	60
	3 <sup>rd</sup> year	56	4	60
	4 <sup>th</sup> year	46	14	60
	Year not-bound	21		21
	Total	303	28	331

## 5. Program Courses

Code	Course	Course Hours/Week				Level	Semester
		Lectures	Tutorials	Labs.	Total		
BES 011	Mathematics (1-A)	4	2	-	6	Preparatory year	1 <sup>st</sup> semester
BES 012	Physics (1-A)	3	-	2	5		
BES 003	Mechanics	2	2	-	4		
BES 013	Chemistry	2	-	2	4		
PRE 001	Engineering Drawing & Projection	2	4	-	6		
BES 014	History of Eng- Sciences	2	1	-	3		
BES 004	English Language .	-	2	-	2		
BES 021	Mathematics (1-B)	4	2	-	6	Preparatory year	2 <sup>nd</sup> semester
BES 022	Physics (1-B)	3	-	2	5		
BES 003	Mechanics	2	2	-	4		
PRE 021	Production Engineering	2	-	2	4		
PRE 001	Engineering Drawing & Projection	2	4	-	6		
ELE 021	Computer and Programming	2	-	1	3		
BES 004	English Language	-	2	-	2		
ARC101	Arc. Design (1)	1	5	-	6	First Year	1 <sup>st</sup> semester
ARC102	Arch. Building	2	4	-	6		
ARC111	Visual Training	3	3	-	6		
ARC113	Sciagraphy & Perspective (A)	2	2	-	4		
CVE117	Strength and Properties of Materials	2	1	2	5		
CVE118	Survey	2	-	1	3		
ARC101	Arc. Design (1)	1	5	-	6	First Year	2 <sup>nd</sup> semester
ARC102	Arch. Building	2	4	-	6		
ARC121	Sciagraphy & Perspective (B)	2	2	-	4		
ARC122	Theories of Architectural & Environmental design	2	-	-	2		
ARC123	History & Theories of Arch. (1)	4	-	-	4		
ARC124	Computer Applications (1)	2	-	2	4		
CVE127	Theory of Structure (1)	2	2	-	4		
ARC201	Arch. Design (2)	1	5	-	6	Second Year	1 <sup>st</sup> semester
ARC202	Working Design (1)	1	5	-	6		
ARC203	History & Theories of Planning	2	-	-	2		
ARC211	History & Theories of Arch.	4	-	-	4		
ARC212	Technical Installations	4	2	-	6		
CVE217	Theory of Structure (2)	4	2	-	6		
ARC201	Arch. Design (2)	1	5	-	6	Second Year	2 <sup>nd</sup> semester
ARC202	Working Design (1)	1	5	-	6		
ARC203	History & Theories of Planning	2	2	-	4		
ARC222	Interior Design	1	5	-	6		
ARC223	Computer Applications(2)	2	-	2	4		
CVE227	Soil mechanics & foundations	2	1	1	4		
ARC301	Arch. Design (3)	1	5	-	6	Third Year	1 <sup>st</sup> semester
ARC302	Working Design (2)	1	5	-	6		
ARC303	Urban planning	2	4	-	6		
ARC311	Building Economics	2	-	-	2		
CVE317	Concrete Structures	4	2	-	6		
ARC314	History & Theories of Arch. (3)	4	-	-	4		
ARC301	Arch. Design (3)	1	5	-	6	Third Year	2 <sup>nd</sup>

ARC302	Working Design (2)	1	5	-	6		semester
ARC303	Urban planning	2	4	-	6		
ARC321	Quantities & Specifications	2	2	-	4		
CVE328	Steel Structures	2	2	-	4		
ARC323	Elective course (1)	2	-	-	2		
ARC324	Elective course (2)	2	-	-	2		
ARC411	Working Design (3)	1	7	-	8	Fourth Year	1 <sup>st</sup> semester
ARC412	Regional Planning	2	4	-	6		
ARC413	Housing & population studies	2	-	-	2		
ARC414	Landscape design	2	-	-	2		
ARC415	Elective course (3)	2	6	-	8		
ARC416	Elective course (4)	2	2	-	4		
ARC422	Elective course (5)	2	-	-	2	Fourth Year	2 <sup>nd</sup> semester
ARC422	Industrial Sociology	2	-	-	2		
ARC423	Practicing the Profession	2	-	-	2		
ARC424	Project management	4	-	-	4		
ARC425	B.Sc. Project	2	14	-	16		
ARC426	Tender documents & Building laws and legislations	2	2	-	4		

## 6. Course Content

<b>code</b>	<b>ARC 101</b>
<b>name</b>	<b>Architectural Design</b>
	<p>The aims of this course are to provide the Student, upon completing the Architectural Engineering Programmer, with the basic knowledge and skills of how to understand and learn the classical architectural composition, the human dimensions and movements, furniture dimensions and arrangements in order to define architectural spaces. It also allows student to study the spaces related to different activities as far as quality and dimension.</p> <p>-This course will also provide students with the ability to design the elevations and openings needed for each space and to understand the relationship between human needs and climatic and functional requirements. Additionally, the course provides the students with the skill to solve simple design problems.</p>
<b>Code</b>	<b>ARC102</b>
<b>Name</b>	<b>Building Construction</b>
	<p>The course investigates the different basic components of the building and provides the students with the basic knowledge of building types, elements foundations, stairs and also internal and external finishing materials.</p>
<b>code</b>	<b>ARC 113</b>
<b>name</b>	<b>Sciagraphy &amp; Perspective (A)</b>
	<p>This course aims to introduce students to sciagraphy techniques in architectural projects, so that students may apply shade and light effects as means of presentations for their given projects and design work, as the area covered in the course include the required basics of shade and shadow applications in plans, mass plans, and elevations.</p>
<b>code</b>	<b>ARC 121</b>
<b>name</b>	<b>Sciagraphy &amp; Perspective (B)</b>
	<p>This course aims to introduce students to architectural perspective drawings of building exteriors and interiors by displaying the relationships of multiple masses and forms in three</p>

	dimensions.
<b>code</b>	<b><i>ARC 111</i></b>
<b>name</b>	<b><i>Visual Training</i></b>
	This course aims to outline the role of form element issues and encourage an overall awareness of form morphology in light of visual principles.
<b>code</b>	<b><i>ARC 203</i></b>
<b>name</b>	<b><i>History and Theories of Planning</i></b>
	The course aims is to introduce the student to the concepts of urban and regional planning. This introductory course will serve as the basis for the planning courses taught on the Third and Fourth Year Arch.
<b>code</b>	<b><i>ARC 303</i></b>
<b>name</b>	<b><i>Urban Planning</i></b>
	The objective of the course is to introduce the student to urban and regional planning methods and models as the support to the processes of decision making.
<b>code</b>	<b><i>ARC 212</i></b>
<b>name</b>	<b><i>Technical Installations</i></b>
	<ul style="list-style-type: none"> <li>- Introduce students to building technical installations, their design, specifications, functions, maintenance requirements and compatibility with other building elements.</li> <li>- Prepare Students for professional practice by enhancing their understanding of technical systems in buildings whether of water supply, sewer, electricity or acoustics.</li> </ul>
<b>code</b>	<b><i>ARC 202</i></b>
<b>name</b>	<b><i>Working Design (1)</i></b>
	This course aims to introduce students to construction techniques and widen their perception of project implementation in order to graduate architects able to show professional awareness of executing workshop drawings of various project types including architectural elements and their specifications.
<b>code</b>	<b><i>ARC416B</i></b>
<b>name</b>	<b><i>Housing Economics</i></b>
	<ul style="list-style-type: none"> <li>- Introduce students to the options of building in an economic way and thinking with particular concerns to the Egyptian housing economical and social issues.</li> <li>- Enhance students' management of building production and service operations, including capacity planning, process and layout design, and interior design through case studies.</li> </ul>
<b>code</b>	<b><i>ARC415A</i></b>
<b>name</b>	<b><i>Architectural Design (4)</i></b>
	This course aims to introduce bigger scale, multi-floor, complex projects with special concern toward functional relationships and circulation patterns. In addition, it integrates economic factors in design as well as building, environmental and service systems.
<b>code</b>	<b><i>ARC412</i></b>
<b>name</b>	<b><i>Regional Planning</i></b>
	This course introduces students to regional planning concepts using different regional planning techniques through the interpretation of region, regional planning, understanding of regional development plans (inputs and outputs) and understanding theories & models of regional planning. This is in order to make students able to provide scientific criticism for



	regional planning projects and able to carry out regional planning project by the end of this course.
<b>code</b>	<b>ARC416C</b>
<b>name</b>	<b>Urban Design</b>
	This course introduces students to urban design concepts using different urban design techniques through the interpretation of urban design, visual perception and image of the city, understanding the urban space (elements, characteristics, sensations, and sequential path systems. So, by the end of this course students should be able to carry out urban design projects.
<b>code</b>	<b>ARC416A</b>
<b>name</b>	<b>Contemporary Architecture and Heritage</b>
	This course aims to introduce students to the knowledge of Contemporary Architecture, its features, and the relationship between architecture and heritage in various areas of architectural practice, in order to form professionally competent and socially responsible architects equipped with knowledge and skills needed to begin a successful career.
<b>code</b>	<b>ARC 314</b>
<b>name</b>	<b>History and Theories of Architecture (3)</b>
	The course aims to form professionally competent and socially responsible architects equipped with the knowledge and skills needed to begin a successful career, and have the knowledge of the relationship between theory and history of architecture. The course areas cover three major subjects: the history of Islamic architecture from early Muslim eras till the beginning of the twentieth century in the Islamic regions, the history of the European architecture from 19 <sup>th</sup> century till the end of the period of the first generation of modern pioneer architects, and the relationship between arts and architecture through ages, from prehistoric till modern eras.
<b>code</b>	<b>ARC 201</b>
<b>name</b>	<b>Architecture Design (2)</b>
	<ul style="list-style-type: none"> <li>- Provide students with design skills and enhance the basic construction knowledge they had achieved during the first year of architectural engineering.</li> <li>- Develop students' capabilities of introducing architectural solutions and develop concepts in various conventions and by different building techniques.</li> </ul>
<b>code</b>	<b>ARC 301</b>
<b>name</b>	<b>Architectural Design (3)</b>
	This course aims at developing solid understanding of architectural design and providing extensive training in solving advanced design problems. It lays the ground for final year and graduation project work. By the end of this course, students should successfully present their ability to handle design problems in various fields and to provide standard solutions as a minimum along with innovative ideas.
<b>code</b>	<b>ARC 211</b>
<b>name</b>	<b>History and Theories of Architecture (2)</b>
	<ul style="list-style-type: none"> <li>- Introduce students to the philosophies of Christian architectural styles that were associated with church buildings all over Europe starting the 4<sup>th</sup> century and until the end of the 15<sup>th</sup> century, in addition to exploring Renaissance styles which followed and lasted until the 19<sup>th</sup> century.</li> <li>- Enhance students' knowledge regarding design principles and considerations of office and commercial buildings, worship and medical facilities, law courts and entertainment</li> </ul>

	facilities.
<b>code</b>	<b><i>ARC 302</i></b>
<b>name</b>	<b><i>Working Design (2)</i></b>
	This course aims to introduce students to construction techniques and widen their perception of project implementation in order to graduate architects able to show professional awareness of executing workshop drawings of various project types including architectural elements, their specifications and details.
<b>code</b>	<b><i>ARC421B</i></b>
<b>name</b>	<b><i>Theories of Housing (4)</i></b>
	This course aims to introduce dimensions of the housing problem, approaches to deal with it and housing trends in the 3rd world as well as in Egypt..
<b>code</b>	<b><i>ARC 129</i></b>
<b>name</b>	<b><i>Building Construction</i></b>
	The course investigates different basic components of buildings and provides students with basic knowledge of building types, elements and foundations. Moreover, it introduces various construction techniques and emphasizes on architectural elements.
<b>code</b>	<b><i>ARC 211</i></b>
<b>name</b>	<b><i>History and Theories of Architecture (2)</i></b>
	<ul style="list-style-type: none"> <li>- Introduce students to the philosophies of Christian architectural styles that were associated with church buildings all over Europe starting the 4<sup>th</sup> century and until the end of the 15<sup>th</sup> century, in addition to exploring Renaissance styles which followed and lasted until the 19<sup>th</sup> century.</li> <li>- Enhance students' knowledge regarding design principles and considerations of office and commercial buildings, worship and medical facilities, law courts and entertainment facilities.</li> </ul>
<b>code</b>	<b><i>ARC 413</i></b>
<b>name</b>	<b><i>Housing and Population Studies</i></b>
	<ul style="list-style-type: none"> <li>- Introduce the dimensions of housing problems and the right approaches to deal with them.</li> <li>- Explore the most common housing trends in the world and their sociological bases.</li> </ul>
<b>code</b>	<b><i>ARC102</i></b>
<b>name</b>	<b><i>Building Construction</i></b>
	The course investigates the different basic components of the building and provides the students with the basic knowledge of building types, elements foundations, stairs and also internal and external finishing materials.
<b>code</b>	<b><i>ARC 414</i></b>
<b>name</b>	<b><i>Landscape Design</i></b>
	The course introduces students to the basic concepts of landscaping. The areas covered includes: principles of landscaping, tools of landscaping and new trends in landscaping. The main objective is to provide students with the essential background about the subject that enables them to establish the right relationships between the building and its surroundings in terms of aesthetic, functional and environmental considerations.

<b>code</b>	<b>ARC 311</b>
<b>name</b>	<b><i>Building Economics</i></b> This course aims to provide the student with the basic knowledge and skills of how to consider economic factors in designing and constructing a building for cost-effective and efficient development. The course provides students with concepts of economics. The course introduces and discusses techniques and methods of achieving the best value for a building.
<b>code</b>	<b>ARC 411</b>
<b>name</b>	<b><i>Working Design (3)</i></b> The aims of this course are to provide the Student, upon completing the Architectural Engineering Programmed, with the basic knowledge and skills of how produce complete, thorough, neat and clear set of professional workshop drawings to ensure perfect implementation of buildings as designed.
<b>code</b>	<b>ARC424</b>
<b>name</b>	<b><i>Project Management</i></b> <ul style="list-style-type: none"> <li>- Introduce students to how building projects are managed in a strategic way with particular concerns to building projects in Egypt.</li> <li>- Enhance students' management skills of building production and service operations, including capacity planning, process and layout design, and interior design through case studies.</li> <li>- Introduce students to computing, accounting, planning, scheduling, monitoring, and Analyzing project's risk, value engineering, safety, claims and evaluation.</li> <li>- Present an introduction of construction marketing to determine the market needs and how to deal with the market mechanisms.</li> </ul>
<b>code</b>	<b>ARC 323C</b>
<b>name</b>	<b><i>Architectural Criticism</i></b> <ul style="list-style-type: none"> <li>- Raise the efficiency of students' performance of architectural design.</li> <li>- Help students to perceive the general principles that are the base of project evaluation and assessment.</li> </ul>
<b>code</b>	<b>ARC 323</b>
<b>name</b>	<b><i>Urban and Environmental Conservation</i></b> The course aims to provide students with an environmental conscious design, Sustainable development and Environmental Studies, Integrated Environmental Assessment (IEA), Traditional and renewable energy sources.
<b>code</b>	<b>ARC 426</b>
<b>name</b>	<b><i>Tender Documents, Building Laws and Legislations</i></b> <ul style="list-style-type: none"> <li>- Introduce students to the Egyptian building laws and legislations.</li> <li>- Familiarize students with the professional aspects of project legal processes and official documents .</li> </ul>
<b>code</b>	<b>ARC412 C</b>
<b>name</b>	<b><i>Design &amp; developing the rural communities</i></b> This course introduces student to study Design & developing the rural communities concepts using different developing techniques through the: Interpretation of rural communities & understanding of developing OF the rural communities (inputs and outputs) and understanding theories & models of rural planning to be able to provide a scientific criticism for a rural developing project.

By the end of this course the student should be able to carry out rural developing project.	
<b>code</b>	<b>ARC 422</b>
<b>name</b>	<b><i>Practicing the profession</i></b>
The course aims to enable the Student having an overview of different fields of architectural practice and construction industry . It is to provide students with professional concepts, issues, principles,.. and ethical measures .	
<b>code</b>	<b>ARC 321</b>
<b>name</b>	<b><i>Quantities &amp; Specifications</i></b>
The course aims to enhance Students' awareness of accuracy in respect of estimating needs of materials, construction elements, equipments or techniques whether quantitatively or qualitatively. The course will also help students to consider the impact of estimating quantities and deciding the specifications on the design and execution of buildings.	
<b>code</b>	<b>ARC 323D</b>
<b>name</b>	<b><i>Aesthetics and Form</i></b>
The course aims to form professionally competent and socially responsible architects equipped with the knowledge and skills needed to begin a successful career, and have the knowledge of the features of Aesthetics, Form and Architectural Expression, and understand the relationship between the Architecture and the features of Aesthetics in the various areas of architectural practice.	
<b>code</b>	<b>ARC 123</b>
<b>name</b>	<b><i>History and Theories of Architecture (1)</i></b>
This course covers the architectural history, beginning and its development. (Prehistoric architecture, the Ancient Egyptian architecture, Greek and Roman architecture) – An analytical study of the different factors and principles affecting the general style of ancient architecture, through the presentation of different examples and typologies of these kinds of architecture.	
<b>code</b>	<b>ARC223</b>
<b>name</b>	<b><i>Computer Applications (2)</i></b>
This course aims at understanding of computer applications in architecture in general, which includes all the phases of building design, construction, and management. The course introduces students to a wide range of computer applications in the architectural field. The focus would be on the basic and crucial computer skills required for the professional architect such as design rendering, construction documents and 3D modeling. Later on, depending on the remaining course time, further applications will be covered.	
<b>code</b>	<b>ARC324A</b>
<b>name</b>	<b><i>Interior Design</i></b>
This course aims at developing solid understanding of interior architecture as a separate discipline. The course focuses on the fundamentals of interior architecture starting from space, site, function, and ending with a view of the professional practice of interior architecture. Among the aims is to prepare students with all the skills and tools required to develop robust designs whether in commercial or residential buildings. The focus also would be on developing visual presentation of interior designs as well as the construction details.	

## **7. Rules for Completing the Program**

### **7.1 The Bachelor's Degree in Engineering**

On the request of the Board of the Faculty of Engineering, Shebin El-Kom, Minoufiya University awards the Bachelor's degree in Engineering, in one of the following engineering specializations:

1. Electrical Power and Machines Engineering.
2. Mechanical Power Engineering.
3. Production Engineering and Mechanical Design.
4. Civil Engineering.
5. Architecture Engineering.

A fresh student is accepted in the faculty for the B. Sc. Degree and enrolled in the preparatory year, if he/she has obtained the certificate of completing the secondary education, or any equivalent certificate, according to the regulations of acceptance defined by the Supreme Council of the Egyptian Universities.

Without contradicting or violating the rules of Article (36) of the regulations of the Law governing the Egyptian Universities, and on the request of the Faculty Board, and after soliciting the opinion of the council(s) of the concerned department(s) in the faculty, a student who produces a valid acceptable proof that he/she has successfully passed examinations in one or more courses, not among the courses of the final year of study in this faculty, in another faculty of another university or in a scientific institute recognized by the Supreme Council of the Egyptian Universities, may be exempted from attending the lectures.., etc and from sitting for the examinations of some equivalent courses. This exemption should only take effect after the signed approval of the President of Minoufiya University, based on the approval of the University Council of Education and Student Affairs, for each individual case.

The duration of study for the Bachelor's Degree in Engineering is five academic years, starting with a preparatory year, which is general for all students joining the faculty. The distribution of the faculty students among the different specialized departments starts from the first year, that is after successfully passing the preparatory one. This distribution is carried out according to the rules defined by the Faculty Board. The following article (number 7) of this set of regulations clearly defines the courses to be studied in all engineering disciplines made available to the faculty students.

- The tables following Article (16), starting from Table (1) to Table (26), detail the academic courses to be studied to obtain the Bachelor's Degree in Engineering, distributed among the academic semesters, as well as the number of hours required for studying each course. This include, for each and every course, the number of hours dedicated for the following: Lectures, Tutorials, Laboratory work, and Written Examination. The tables detail, as well, the maximum mark for each course, and its distribution among the written (final) examination, the laboratory tests (if needed), the oral examination (if needed) and the semester work.
- The Faculty Board is responsible for approving the scientific contents and materials for each of the academic courses, after being defined and approved by the concerned Department Council.

- It is both acceptable and possible to add new courses to the list of elective courses in each department, in order for the curricula to remain current and compatible with the new scientific trends in the field, on the recommendation of both the Department Council and the Faculty Board, subject to the approval of the University Council.
- It is up to the Faculty Board to define the members of the assistant staff who should help in teaching courses having special teaching needs, such as Engineering Drawing, Machine Drawing, Technical Workshops and Laboratories, as well as those courses of the Department of Architecture Engineering (this needs the approval of the Faculty Board).

The study for the Bachelor's Degree in the faculty includes a system for summer training, under the supervision of the faculty staff, both inside and outside the faculty premises. This training is conducted as follows:

a) Engineering Drawing Training:

After successfully passing the examinations of the preparatory year, students should attend this training inside the faculty for thirty (30) hours per week, and for four (4) consecutive weeks, during the summer vacation.

b) Field Training:

Students enrolled in the second year (i.e. after successfully passing both the preparatory and the first years) should engage in a field training activity for four (4) weeks outside the faculty, in suitable specialized establishments. By the end of the period of this field training, the student should submit to the faculty a written technical report, detailing the theoretical and practical gains acquired, and the technical expertise he/she has developed, during this training period.

The student should not be allowed to graduate from the faculty before satisfying this condition.

Students in the fourth and final year of study in the faculty should prepare a final-year graduation project and should submit a written suitable report. The concerned Department Council(s) is(are) responsible for defining the subjects suitable for conducting such graduation projects. The students in different specialized departments are allowed a grace period of four (4) weeks, after finishing the second semester examinations, before finalizing their graduation projects, while those students in the Department of Architecture Engineering are allowed a period of six (6) weeks for the same purpose.

- A Faculty student is allowed to proceed for enrollment in the academic year next to the one he/she is enrolled in, if he/she successfully passes the examinations in all courses of the current academic year, or if he/she has failed the examinations of the current year in no more than two courses.
- The student will be allowed to sit for the examination(s) of this/these failed course(s), along with the students of the academic year where this/these course(s) is/are being offered at the time. Irrelevant to the marks the student who passes this/these examination(s) scores, a grade of only "PASS" will be considered for him/her in any such course.
- The Faculty students enrolled in the final year of their study for the Bachelor's Degree, who fail their B. Sc. Examinations in no more than two courses, are allowed to

sit for the examination(s) in this/these course(s) in the make-up examinations held during September of each academic year.

If the examination system of a course includes an oral or a practical examination, beside the written examination, the student's total mark scored in this course should be the sum of all these partial examinations, added to the student's semester work mark.

For students enrolled in all sections and departments in the fourth year of their academic study, there should be, arranged by the faculty, suitable scientific trips under the direct supervision of the faculty staff. These trips should be arranged to visit establishments or sites relevant to the students' subjects of specialization, or to their graduation projects to enhance their understanding of the relevant theoretical and practical knowledge.

Conducting these trips is subject to the regulations and approval of the Faculty Board, based on recommendations of the concerned Department Council(s).

The grading system for the individual courses of study, and for calculating the whole year or final graduation grade is defined as follows, based on the percentage of the student's total mark(s) in either the single course or the grand total of his marks in all courses:

Passing Students:

Distinction	85% or more,
Very Good	75% up to less than 85%,
Good	65% up to less than 75%, and
Pass	50% up to less than 65%.

Failing Students:

Weak	30% up to less than 50%, and
Very Weak	less than 30%.

The student is required to attend not less than 75% of the hours of each course, in order to be allowed to sit for the examinations of the concerned course.

The Faculty Board, on request of the concerned Department Council(s) will approve that any student who fails to fulfill such condition in any course, is barred from sitting for the examinations of that course.

That student will, consequently, be treated as those who failed the examination(s) in that/those course(s), which he/she has been barred from sitting for its/their examination(s), unless the student produces an excuse which is acceptable to the Faculty Board, in which case he/she will be considered as "absent from the concerned course(s) with an acceptable excuse".

It is at the discretion of the Faculty Board to accept, for its consideration, applications to join the faculty from:

- B.Sc. graduates of other university faculties, or of other scientific institutes whose degrees are equivalent to the aforementioned degrees, according to the regulations of the Law governing the Egyptian Universities, or
- Students enrolled in one of the specialized departments or sections therein of the faculty, who wish to study in another scientific department or section therein.

The approval of these applications will be subject to the rules defined by the concerned Department Council(s), as at which year of the academic study the applicant will be allowed to join the faculty, and which courses he/she has to study and then sit for their examinations.

Based on the recommendations of both the concerned Department Council, and the Faculty Board, and the approval of the University President, the student will be allowed to enroll, and will be responsible for the completion of the requirements of this enrollment in the faculty.

Applications are to be received by the faculty from applicants during September of each academic year.

This set of internal regulations of the curricula plan is to be applied to the preparatory year students, starting from the first semester of the academic year 2003/2004G, as well as to the students of the first year in all departments.

Starting from the academic year 2004/2005G, this plan will be gradually applied to students at the other years of their academic studies.

## 8. Methods of Evaluating the Program

Evaluator	Tools	Examples
Final year students	Questionnaire	•
Graduates	Questionnaire	•
Stakeholders	Questionnaire	•
External Evaluators	Evaluation reports	
Others	Students scientific conference. Seminars.	Last students scientific conference was in semester 2011-2012

Coordinator of Program Quality assurance committee	Head of Electrical Dept. Council
<i>Prof.Dr./ Ahmed Ahmed El Kholei</i> <i>Date: 11 November 2012</i>	<i>Prof. Dr./Mahmoud Amin</i> <i>Date: 11 November 2012</i>