



# Program & Course Specifications of Civil Engineering



# Program Specifications



# I. Basic information:

1- Program name	Civil Engineering
2- Program type	Single
<b>3-</b> Adoption Date	2006
4- Study system	Semester System

# **II.** Specialized Information:

# **1-PROGRAM MISSION**

To graduate civil engineers with distinguished competitive level in local, regional and international markets by providing an excellent atmosphere of study represented in high caliber Faculty members and appropriate infrastructure through advanced laboratory equipment and appropriate library facilities. The students thus acquire information and skills concerning latest development in civil engineering applications.

# **2-PROGRAM OBJECTIVES**

The graduates of the engineering programs should be able to:

- O1) Apply knowledge of mathematics, science and engineering concepts to the solution of engineering problems.
- O2) Design a system; component and process to meet the required needs within realistic constraints.
- O3) Design and conduct experiments as well as analyze and interpret data.
- O4) Identify, formulate and solve fundamental engineering problems.
- O5) Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management.
- O6) Work effectively within multi-disciplinary teams.
- O7) Communicate effectively.
- O8) Consider the impacts of engineering solutions on society & environment.
- O9) Demonstrate knowledge of contemporary engineering issues.
- O10) Display professional and ethical responsibilities; and contextual understanding
- O11) Engage in self- and life- long learning.

In addition to the general attributes of engineer, the civil engineer should be able to:

- O12) Act professionally in design and supervision of civil engineering disciplines
- O13) Use the codes of practice of all civil engineering disciplines effectively and professionally
- O14) Design, construct and protect all types of excavations and tunneling systems for different purposes



Civil Engineering Department

- O15) Manage construction sites
- O16) Select appropriate building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment
- O17) Select and design adequate water control structures, irrigation and water networks, sewerage systems and pumping stations
- O18) Define and preserve properties (lands, real estates) of individuals, communities and institutions, through different surveying and GIS tools
- O19) Design and construct structures for protection against dangers of unexpected natural events such as floods and storms
- O20) Lead and supervise a group of designers and site or lab technicians

#### 3- Academic standards

External references for standards (benchmarks)

The National Academic Reference Standards (NARS) for engineering has been adapted as an external reference for the programme. The benchmarks of the reference are as follows:

#### PROGRAM CHARACTERISTICS

- 1. Design and construction of all types of buildings for social, economic, industrial as well as multipurpose buildings.
- 2. Design and protection of all types of excavation for different purposes and protection of surrounding buildings and/or structures.
- 3. Choice of adequate construction materials from the perspective of strength, durability, suitability of use, location, temperature, weather conditions and impacts of seawater.
- 4. Design of structures that are suitable to different loading conditions, and liable to sustain static & dynamic forces.
- 5. Design of required pipeline networks for both potable water and sewage water.
- 6. Water resources management systems for economic and conjunctive use of available water.
- 7. Defining and preserving the properties (lands, real estates) of individuals, communities and institutions, through different surveying and GIS tools

8. Transportation, through planning, geometric and structural designing and constructing, operating, controlling and carrying out maintenance of roadways, highways, railways and runways.

9. Protection from dangers of unexpected natural events as floods, storms, very high winds and/or waves.

- 10. Design and construction of tunneling systems for different purposes.
- 11. Project and construction management.



Menoufia University Civil Engineering Department

Undergraduate Program

# 4- PROGRAM ACADEMIC REFERENCE STANDARDS

The program adopts <u>the National Academic Reference Standards (NARS)</u> for Civil Engineering Characterization, which are:

	By the end o	f the program, the graduates of the civil engineering program should
	be able to apr	raise:
		A.1) Concepts and theories of mathematics and sciences.
		appropriate to Civil Engineering.
		A.2) Basics of information and communication technology (ICT)
		A.3) Characteristics of engineering materials related to Civil
		Engineering.
50		A.4) Principles of design including elements design, process and/or
din		a system related to Civil Engineering.
Jue		collection and interpretation
rsta	Engineering	A.6) Quality assurance systems, codes of practice and standards.
ler	88	health and safety requirements and environmental issues.
Jnc		A.7) Business and management principles relevant to engineering.
		A.8) Current engineering technologies as related to Civil
lge &		Engineering.
		A.9) Topics related to humanitarian interests and moral issues.
lec		A.10) Technical language and report writing
MO		A.11) Professional entries and impacts of engineering solutions on society and environment
<u>X</u> n		A.12) Contemporary engineering topics.
		A.13) Engineering principles in the fields of reinforced concrete and
	Civil Engineering	metallic structures' analysis and design, geotechnics and foundations,
		hydraulics and hydrology, water resources, environmental and
		sanitary engineering, roadways and traffic systems, surveying and
		photogrametry $(\Lambda, 14)$ . Properties, behavior and fabrication of building materials
		A.15) Projects and construction management including planning.
		finance, bidding and contracts
	By the end	of the program, graduate should be able to:
		B.1) Select appropriate mathematical and computer-based methods
		for modeling and analyzing problems.
7.		B.2) Select appropriate solutions for engineering problems based on
illi		(B 3) Think in a creative and innovative way in problem solving and
Sk		design.
al		B.4) Combine, exchange, and assess different ideas, views, and
ctu	Engineering	knowledge from a range of sources.
lle	Lingineering	B.5) Assess and evaluate the characteristics and performance of
lte		components, systems and processes.
I		B 7) Solve engineering problems often on the basis of limited and
		possibly contradicting information.
		B.8) Select and appraise appropriate ICT tools to a variety of
		engineering problems.
		B.9) Judge engineering decisions considering balanced costs,



#### Civil Engineering Department

		benefits, safety, quality, reliability, and environmental impact.					
		B.10) Incorporate economic, societal, and environmental and risk					
		management dimensions in design.					
		B.11) Analyze results of numerical models and assess their					
		limitations.					
		B.12) Innovate systematic and methodic approaches when dealing					
		with new and advancing technology.					
		B.13) Select appropriate building materials from the perspective of					
		strength, durability, suitability of use to location, temperature,					
		<b>B</b> 14) Select and design adequate water control structures irrigation					
		B.14) Select and design adequate water control structures, irrigation					
	Civil	B 15) Analyze and select codes of practices in designing reinforced					
	Engineering	engineering concrete and metallic structures of all types. Determine					
	Lingineering	the levels, types and design systems of building foundations,					
		tunnels and excavations					
		B.16) Define, plan, conduct and report management techniques					
		B.17) Assess and evaluate different techniques and strategies for					
		solving engineering problems					
	By the end	of the program, graduate should be able to:					
		C 1) Apply knowledge of mathematics science information					
		technology design business context and engineering practice					
		integrally to solve engineering problems.					
		C.2) Professionally merge the engineering knowledge,					
		understanding, and feedback to improve design, products and/or					
		services.					
		C.3) Create and/or re-design a process, component or system, and					
		carry out specialized engineering designs.					
		C.4) Practice the neatness and aesthetics in design and approach.					
		C.5) Use computational facilities and techniques, measuring					
s		instruments, workshops and laboratory equipment to design					
ili	Enginopring	C(6) Use a wide range of analytical tools, techniques, equipment					
Š	Engineering	and software packages pertaining to Civil Engineering and develop					
al		required computer programs.					
OD		C.7) Apply numerical modeling methods to engineering problems.					
ssi		C.8) Apply safe systems at work and observe the appropriate steps					
lfe		to manage risks.					
Jr.		C.9) Demonstrate basic organizational and project management					
		skills.					
		C.10) Apply quality assurance procedures and follow codes and					
		standards.					
		c.11) Exchange knowledge and skills with engineering community					
		C 12) Prepare and present technical reports					
	 	C 13) Use laboratory and field againment competently and sefely					
		C(14) Observe record and analyze data in laboratory and in the field					
	<i>a</i>	C.15) Practice professionally construction management skills					
	Civil	Prepare technical drafts and detailed drawings both manually and					
	Engineering	using CAD					
		C.16) carry out maintenance of all types of roadways and traffic					
		systems					



#### Civil Engineering Department

		<ul><li>C.17) Prepare quantity surveying reports</li><li>C.18) Plan, design, construct, operate, control and carry ou maintenance of all types of roadways and traffic systems.</li></ul>					
	By the end	of the program, graduate should be able to:					
	Engineering	D.1) Collaborate effectively within multidisciplinary team.					
General Skills	Civil Engineering	<ul> <li>D.2) Work in stressful environment and within constraints.</li> <li>D.3) Communicate effectively.</li> <li>D.4) Demonstrate efficient IT capabilities.</li> <li>D.5) Lead and motivate individuals.</li> <li>D.6) Effectively manage tasks, time, and resources.</li> <li>D.7) Search for information and engage in life-long self learning discipline.</li> <li>D.8) Acquire entrepreneurial skills.</li> <li>D.9) Refer to relevant literatures.</li> </ul>					



Civil Engineering Department

Undergraduate Program

# **4- RELATIONSHIP BETWEEN ACADEMIC STANDARDS AND OBJECTIVES**

	Acadamic Standards				Program Objectives												
	Acauchine Stanuarus	01	02	030	405	<b>O6</b> O'	7 08	<b>09</b> C	)100	011 C	)12 ()	13 014	015	016	)1701	8 0 1 9	020
	A.1) Concepts and theories of mathematics and sciences, appropriate to Civil Engineering.	Х		XΣ	Κ												
	A.2) Basics of information and communication technology (ICT)					X											
	<ul> <li>A.3) Characteristics of engineering materials related to Civil Engineering.</li> <li>A.4) Principles of design including elements design, process and/or a system related to Civil Engineering.</li> </ul>																
ing																	
pu	A.5) Methodologies of solving engineering problems, data collection and interpretation		Х	Σ	Κ												
lersta	A.6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.	1	X	X X	XX		X				X X	K					
Jnd	A.7) Business and management principles relevant to engineering.				Х								Χ				
d C	A.8) Current engineering technologies as related to Civil Engineering.		Х		Х			Χ									
an	A.9) Topics related to humanitarian interests and moral issues.					X			X				Χ				
ge	A.10) Technical language and report writing				Х	X	-		2	X							
led	A.11) Professional ethics and impacts of engineering solutions on society and environment						Х		X								
0M]	A.12) Contemporary engineering topics.							Х									
Kn	A.13) Engineering principles in the fields of reinforced concrete and metallic structures' analysis and design, geotechnics and foundations, hydraulics and hydrology, water resources, environmenta and sanitary engineering, roadways and traffic systems, surveying and photogrametry	1 1 X	X	У	XX						x	X		x	X		
	A.14) Properties, behavior and fabrication of building materials		Χ											Х			
	A.15) Projects and construction management including planning, finance, bidding and contracts				Х								Х				
ıal	B.1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems.	X	X	Σ	K												
sctu	B.2) Select appropriate solutions for engineering problems based on analytical thinking.	Х	Χ	Σ	Κ												
elle Ski	B.3) Think in a creative and innovative way in problem solving and design.	Х		Σ	Κ												
Int	B.4) Combine, exchange, and assess different ideas, views, and knowledge from a range of sources	X	-	XΣ	Κ		Х	Х	2	X							
	B.5) Assess and evaluate the characteristics and performance of components, systems and		X	XΣ	Κ												



# Civil Engineering Department

	processes.															Т	
	B.6) Investigate the failure of components, systems, and processes.	Х	Χ	Х												X	<u> </u>
	B.7) Solve engineering problems, often on the basis of limited and possibly contradicting information.		X		X			X									
	B.8) Select and appraise appropriate ICT tools to a variety of engineering problems.		Х		X	X											
	B.9) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.		X		X	X		X		X			X				
	B.10) Incorporate economic, societal, and environmental and risk management dimensions in design.		Х		Х			Х		Х			Х				
	B.11) Analyze results of numerical models and assess their limitations.	Х	X			X											
	B.12) Innovate systematic and methodic approaches when dealing with new and advancing technology.		X		-	X				X							
	B.13) Select appropriate building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment		X	X						X				X			
	B.14) Select and design adequate water control structures, irrigation and water networks, sewerage systems and pumping stations		X							X	X	X		X	Х		
	B.15) Analyze and select codes of practices in designing reinforced engineering concrete and metallic structures of all types. Determine the levels, types and design systems of building foundations, tunnels and excavations		X		X					x	X	X				X	<u> </u>
	B.16) Define, plan, conduct and report management techniques				]	X							Х				
	B.17) Assess and evaluate different techniques and strategies for solving engineering problems	Х	Х	Х		X				Х							
ls	C.1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	X	X	X	X	X											
Skil	C.2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.	X	X		X			X									
sional	C.3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.		X		X			X		X							
iess	C.4) Practice the neatness and aesthetics in design and approach.		Х		-	X		Х	Х								
Prof	C.5)Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.			X		X											
	C.6)Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to	X	Χ	Χ		X	$\square$										



#### Civil Engineering Department

#### Undergraduate Program

																		_
	Civil	Engineering and develop required computer programs.																
	C.7)	Apply numerical modeling methods to engineering problems.	Х															
	C.8)	Apply safe systems at work and observe the appropriate steps to manage risks.			Х	Σ	Κ			Х	Κ	Х						
	C.9)	Demonstrate basic organizational and project management skills.				Σ	Κ					Х						
	C.10)	Apply quality assurance procedures and follow codes and standards.		Х		Σ	Κ					Х	Χ					
	C.11)	Exchange knowledge and skills with engineering community and industry.					X	X	2	X	X	ζ						
	C.12)	Prepare and present technical reports.						Х			X	2						
	C.13)	Use laboratory and field equipment competently and safely			Х													
	C.14)	Observe, record and analyze data in laboratory and in the field			Х										Х	Х	Χ	
	C.15)	Practice professionally construction management skills. Prepare technical drafts and detailed				5	ζ					v		v				
	drawi	ngs both manually and using CAD				1	7					Λ		Λ				
	C.16)	carry out maintenance of all types of roadways and traffic systems										Χ						
	C.17)	Prepare quantity surveying reports														Х	Χ	
	C.18)	Plan, design, construct, operate, control and carry out maintenance of all types of roadways																
	and tr	affic systems.																
	D.1)	Collaborate effectively within multidisciplinary team.					X	X				Х						Х
	D.2)	Work in stressful environment and within constraints.							Χ	Х	K	Х						Х
ills	D.3)	Communicate effectively.					X	X				Х						Х
SK	D.4)	Demonstrate efficient IT capabilities.				Σ	Κ											
ral	D.5)	Lead and motivate individuals.					Х	X										Х
nei	D.6)	Effectively manage tasks, time, and resources.				Σ	XΧ	r -		Х	K	Х						Х
g	D.7)	Search for information and engage in life-long self learning discipline.		Х		Χ			2	X								
-	D.8)	Acquire entrepreneurial skills.				Σ	XX			Х	K							
	D.9)	Refer to relevant literatures.						X	Χ	X	XX			-				

10/54



#### 6- Comparison of provision to external references

The academic standards for the programme are more or less similar to the reference standard (NARS). Although these standards have been considered long before the NARS was available, it contains almost the same benchmarks that guarantee the proper achievement of the outcomes of the learning process.

		Academic Standards of the program	Intended Learning Outcomes (ILOs) of the program
		A.1) Concepts and theories of mathematics and sciences, appropriate to Civil Engineering.	A.1) <b>Demonstrate</b> Concepts and theories of mathematics and sciences, appropriate to Civil Engineering.
		A.2) Basics of information and communication technology (ICT)	A.2) <b>Recognise</b> Basics of information and communication technology (ICT)
ding		A.3) Characteristics of engineering materials related to Civil Engineering.	A.3) <b>Classify</b> Characteristics of engineering materials related to Civil Engineering
stanc	50	A.4) Principles of design including elements design, process and/or a system related to Civil Engineering	A.4) <b>List</b> Principles of design including elements design, process and/or a system related to Civil Engineering.
Jnder	eering	A.5) Methodologies of solving engineering problems, data collection and interpretation	A.5) <b>Recognise</b> Methodologies of solving engineering problems, data collection and interpretation
and I	Engin	A.6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental	A.6) <b>Remember</b> Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.
wledge		A.7) Business and management principles relevant to engineering.	A.7) <b>Know</b> Business and management principles relevant to engineering.
Kno		A.8) Current engineering technologies as related to Civil Engineering.	A.8) <b>Match</b> Current engineering technologies as related to Civil Engineering.
		A.9) Topics related to humanitarian interests and moral issues.	A.9) <b>Demonstrate</b> topics related to humanitarian interests and moral issues.
		A.10) Technical language and report writing	A.10) <b>Know</b> technical language and report writing
		A.11) Professional ethics and impacts of engineering	A.11) Demonstrate professional ethics and impacts of engineering



#### Civil Engineering Department

#### Undergraduate Program

		solu	tions on society and environment	solutions on society and environment
		A.12)	Contemporary engineering topics.	A.12) Select contemporary engineering topics.
	Engineering	A.13)	Engineering principles in the fields of reinforced concrete and metallic structures' analysis and design, geotechnics and foundations, hydraulics and hydrology, water resources, environmental and sanitary engineering, roadways and traffic systems, surveying and photogrametry	A.13) <b>Know</b> engineering principles in the fields of reinforced concrete and metallic structures' analysis and design, geotechnics and foundations, hydraulics and hydrology, water resources, environmental and sanitary engineering, roadways and traffic systems, surveying and photogrametry
	Civil	A.14)	Properties, behavior and fabrication of building materials	A.14) <b>Illustrate</b> properties, behavior and fabrication of building materials
		A.15)	Projects and construction management including planning, finance, bidding and contracts	A.15) <b>Judge</b> Projects and construction management including planning, finance, bidding and contracts
		B.1)	Select appropriate mathematical and computer-based methods for modeling and analyzing problems.	B.1) <b>Select</b> appropriate mathematical and computer-based methods for modeling and analyzing problems.
		B.2)	Select appropriate solutions for engineering problems based on analytical thinking.	B.2) <b>Select</b> appropriate solutions for engineering problems based on analytical thinking.
S		B.3) Think in a creative and innovative way in problem solving and design.		B.3) <b>Think</b> in a creative and innovative way in problem solving and design.
Skill	ering	B.4)	Combine, exchange, and assess different ideas, views, and knowledge from a range of sources.	B.4) <b>Combine</b> , exchange, and assess different ideas, views, and knowledge from a range of sources.
ctual	ıgine	B.5)	Assess and evaluate the characteristics and performance of components, systems and processes.	B.5) <b>Assess</b> and evaluate the characteristics and performance of components, systems and processes.
elle	En	B.6)	Investigate the	B.6) Investigate the failure of components, systems, and processes.
nte			failure of components, systems, and processes.	
Ι		B.7)	Solve engineering problems, often on the basis of limited and possibly contradicting information.	B.7) <b>Solve</b> engineering problems, often on the basis of limited and possibly contradicting information.
		B.8)	Select and appraise appropriate ICT tools to a variety of engineering problems.	B.8) <b>Select</b> and appraise appropriate ICT tools to a variety of engineering problems.
		B.9)	Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental	B.9) <b>Judge</b> engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.

12/54



#### Civil Engineering Department

		impact.	
		B.10) Incorporate economic, societal, environmental and risk	B.10) <b>Incorporate</b> economic, societal, environmental and risk management
		management dimensions in design.	dimensions in design.
		B.11) Analyze results of numerical models and assess their	B.11) Analyze results of numerical models and assess their limitations.
		limitations.	
		B.12) Innovate systematic and methodic approaches when	B.12) <b>Innovate</b> systematic and method approaches when dealing with new and
		dealing with new and advancing technology.	advancing technology.
		B.13) Select appropriate building materials from the	B.13) Select appropriate building materials from the perspective of
		perspective of strength, durability, suitability of use to	strength, durability, suitability of use to location, temperature, weather
		location, temperature, weather conditions and impacts of	conditions and impacts of seawater and environment
		seawater and environment	
	ng	B.14) Select and design adequate water control structures,	B.14) Select and design adequate water control structures, irrigation and
	eri	irrigation and water networks, sewerage systems and	water networks, sewerage systems and pumping stations
	ine	pumping stations	
	ngi	B.15) Analyze and select codes of practices in designing	B.15) Analyze and select codes of practices in designing reinforced
	Ε	reinforced engineering concrete and metallic structures	engineering concrete and metallic structures of all types. Determine the
	İVİ	of all types. Determine the levels, types and design	levels, types and design systems of building foundations, tunnels and
	$\circ$	systems of building foundations, tunnels and excavations	excavations
		B.16) Define, plan, conduct and report management	B.16) <b>Define</b> , plan, conduct and report management techniques
		techniques	
		B.17) Assess and evaluate different techniques and strategies	B.17) Assess and evaluate different techniques and strategies for solving
		for solving engineering problems	engineering problems
S		C.1) Apply knowledge of mathematics, science, information	C.1) <b>Apply</b> knowledge of mathematics, science, information technology,
zill (	50	technology, design, business context and engineering	design, business context and engineering practice integrally to solve
S	ing	practice integrally to solve engineering problems.	engineering problems.
lal	er	C.2) Professionally merge the engineering knowledge,	C.2) Professionally <b>merge</b> the engineering knowledge, understanding, and
ioi	ine	understanding, and feedback to improve design, products	feedback to improve design, products and/or services.
ess	ng	and/or services.	
of	E	C.3) Create and/or re-design a process, component or	U.3) <b>Create</b> and/or re-design a process, component or system, and carry out
Ы		system, and carry out specialized engineering designs.	specialized engineering designs.
		U.4) Practice the neatness and aesthetics in design and	U.4) <b>Practice</b> the neatness and aesthetics in design and approach.

![](_page_13_Picture_0.jpeg)

#### Civil Engineering Department

	approach.	
	C.5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.	C.5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.
	C.6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to Civil Engineering and develop required computer programs.	C.6) <b>Use</b> a wide range of analytical tools, techniques, equipment, and software packages pertaining to Civil Engineering and develop required computer programs.
	C.7) Apply numerical modeling methods to engineering problems.	C.7) <b>Apply</b> numerical modeling methods to engineering problems.
	C.8) Apply safe systems at work and observe the appropriate steps to manage risks.	C.8) <b>Apply</b> safe systems at work and observe the appropriate steps to manage risks.
	C.9) Demonstrate basic organizational and project management skills.	C.9) <b>Demonstrate</b> basic organizational and project management skills.
	C.10) Apply quality assurance procedures and follow codes and standards.	C.10) <b>Apply</b> quality assurance procedures and follow codes and standards.
	C.11) Exchange knowledge and skills with engineering community and industry.	C.11) <b>Exchange</b> knowledge and skills with engineering community and industry.
	C.12) Prepare and present technical reports.	C.12) <b>Prepare</b> and present technical reports.
	C.13) Use laboratory and field equipment competently and safely	C.13) Use laboratory and field equipment competently and safely
eering	C.14) Observe, record and analyze data in laboratory and in the field	C.14) <b>Observe</b> , record and analyze data in laboratory and in the field
il Engin	C.15) Practice professionally construction management skills. Prepare technical drafts and detailed drawings both manually and using CAD	C.15) <b>Practice</b> professionally construction management skills. Prepare technical drafts and detailed drawings both manually and using CAD
Civ	C.16) carry out maintenance of all types of roadways and traffic systems	C.16) <b>Carry</b> out maintenance of all types of roadways and traffic systems
	C.17) Prepare quantity surveying reports	C.17) Prepare quantity surveying reports

![](_page_14_Picture_0.jpeg)

#### Civil Engineering Department

#### Undergraduate Program

		C.18) Plan, design, construct, operate, control and carry out	C.18) Plan, design, construct, operate, control and carry out maintenance
		maintenance of all types of roadways and traffic systems.	of all types of roadways and traffic systems.
		D.1) Collaborate effectively within multidisciplinary team.	D.1) Collaborate effectively within multidisciplinary team.
v.	2	D.2) Work in stressful environment and within constraints.	D.2) Work in stressful environment and within constraints.
kill		D.3) Communicate effectively.	D.3) <b>Communicate</b> effectively.
ral Sl	2	D.4) Demonstrate efficient IT capabilities.	D.4) <b>Demonstrate</b> efficient IT capabilities.
		D.5) Lead and motivate individuals.	D.5) Lead and motivate individuals.
ne		D.6) Effectively manage tasks, time, and resources.	D.6) Effectively <b>manage</b> tasks, time, and resources.
Le Le	)	D.7) Search for information and engage in life-long self	D.7) <b>Search for</b> information and engage in life-long self learning discipline.
		learning discipline.	
		D.8) Acquire entrepreneurial skills.	D.8) Acquire entrepreneurial skills.
		D.9) Refer to relevant literatures.	D.9) <b>Refer to</b> relevant literatures.

15/54

![](_page_15_Picture_0.jpeg)

Г

Τ

# **7-RELATIONSHIP BETWEEN ILOs AND COURSES**

Int	tende	d Learning Outcomes (ILOs) of the program	Courses that assess in realizing ILOs
	By t	he end of the program, student should be able to:	
		A.1) <b>Demonstrate</b> Concepts and theories of mathematics and sciences, appropriate to Civil Engineering.	BES011, BES012, BES003, BES013 PRE011, PRE001, BES021, BES022, BES023, CVE102, CVE113, BES114, CVE122, BES128, CVE201, CVE202, BES214, CVE214, CVE215, CVE223, CVE301, CVE314, CVE421, CVE424B, CVE425B, CVE425A,
		A.2) <b>Recognise</b> Basics of information and communication technology (ICT)	ELE021, CVE113, CVE213, CVE223, CVE322, CVE322, CVE421, CVE424B
derstanding	•	<ul> <li>A.3) Classify Characteristics of engineering materials related to Civil Engineering</li> <li>A.4) List Principles of design including elements design, process and/or a system related to Civil Engineering.</li> </ul>	BES012, BES002, PRE021, ElE127, MPE129, CVE213, CVE222, CVE223, CVE421, CVE424B           PRE001, CVE202, CVE214, CVE223, CVE302, CVE313, CVE321, CVE322, CVE324B, CVE325A, CVE411, CVE412, CVE414A, CVE414B, CVE421, CVE422, CVE424A, CVE424B, CVE425B
ledge and Unders	Engineering	A.5) <b>Recognise</b> Methodologies of solving engineering problems, data collection and interpretation	BES011, BES021, CVE102, CVE112, CVE113, BES114, ARC129, BES128, CVE201, CVE202, CVE214, CVE215, CVE221, CVE301, CVE302, CVE314, CVE315, CVE323, CVE415B, CVE424A, CVE425A,
Know		A.6) <b>Remember</b> Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.	CVE101, CVE111, CVE222, CVE223, CVE302, CVE321, CVE324A, CVE414B, CVE422, CVE425B,
		A.7) <b>Know</b> Business and management principles relevant to engineering.	CVE316, CVE426
		A.8) <b>Match</b> Current engineering technologies as related to Civil Engineering	BES014, PRE021, BES214, CVE324A, CVE324B, CVE413, CVE414A, CVE424A, CVE425B,
		A.9) <b>Demonstrate</b> topics related to humanitarian interests and moral issues.	BES004, CVE302, CVE316, CVE413, CVE426
		A.10) <b>Know</b> technical language and report writing	BES004, CVE201, CVE301, CVE324A, CVE414A, CVE425A
		A.11) <b>Demonstrate</b> professional ethics and impacts of engineering solutions on society and environment	CVE101, CVE111, CVE201, CVE301, CVE316, CVE321, CVE413, CVE414B, CVE421, CVE424B, CVE425B

![](_page_16_Picture_0.jpeg)

Civil Engineering Department

Int	tende	d Learning Outcomes (ILOs) of the program	Courses that assess in realizing ILOs
		A.12) <b>Select</b> contemporary engineering topics.	CVE313, CVE316, CVE324A, CVE413, CVE426, CVE425B
	l Engineering	A.13) <b>Know</b> engineering principles in the fields of reinforced concrete and metallic structures' analysis and design, geotechnics and foundations, hydraulics and hydrology, water resources, environmental and sanitary engineering, roadways and traffic systems, surveying and photogrametry	CVE111, CVE112, ARC129, CVE215, CVE221, CVE223, CVE313, CVE314, CVE315, CVE321, CVE323, CVE324B, CVE325A,CVE412, CVE413, CVE414B, CVE415B, CVE422, CVE425B
	Civi	<ul> <li>A.14) Illustrate properties, behavior and fabrication of building materials</li> <li>A.15) Judge Projects and construction management including planning, finance bidding and contracts</li> </ul>	CVE111, CVE 313, CVE411 CVE223, CVE316, CVE321, CVE414B, CVE422, CVE426
		B.1) Select appropriate mathematical and computer-based methods for modelling and analyzing problems.	BES011, BES021, ELE021, CVE102, CVE113, CVE201, CVE202, BES214, CVE215, CVE223, CVE301, CVE314, CVE321, CVE414B, CVE422, CVE425A
		B.2) Select appropriate solutions for engineering problems based on analytical thinking.	BES021, BES003, BES128, CVE201, CVE213, BES214, CVE214, CVE215, CVE301, CVE314, CVE315, CVE324B, CVE325A, CVE411, CVE412, CVE414A, CVE424A, CVE42A
		B.3) <b>Think</b> in a creative and innovative way in problem solving and design.	BES012, PRE001, BES014, BES022, PRE021, BES114, ELE127, MOE129, BES128, CVE202, BES214, CV215, CVE202, CVE313, CVE321, CVE324A, CVE412, CVE414B, CVE422
	ering	B.4) <b>Combine</b> , exchange, and assess different ideas, views, and knowledge from a range of sources.	BES004, CVE101, CVE214, CVE302, CVE313, CVE316,
	Engine	B.5) Assess and evaluate the characteristics and performance of components, systems and processes.	BES003, BES013, PRE011, BES022, CVE302, CVE316, CVE322, CVE425A
	Γ	B.6) <b>Investigate</b> the failure of components, systems, and processes.	CVE411, CVE424A
		B.7) <b>Solve</b> engineering problems, often on the basis of limited and possibly contradicting information.	BES214, CVE314, CVE411, CVE421, CVE424B CVE426, CVE424A
		B.8) Select and appraise appropriate ICT tools to a variety of engineering problems.	ELE021, CVE113, CVE214, CVE413
		B.9) <b>Judge</b> engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.	CVE223, CVE321, CVE324A, CVE414B, CVE422, CVE426, CVE425B
		B.10) <b>Incorporate</b> economic, societal, environmental and risk management dimensions in design.	CVE201, CVE301, CVE413, CVE425A, CVE425B,

![](_page_17_Picture_0.jpeg)

Civil Engineering Department

In	tende	d Learning Outcomes (ILOs) of the program	Courses that assess in realizing ILOs
		B.11) <b>Analyze</b> results of numerical models and assess their limitations.	CVE102, CVE213, CVE223, CVE302, CVE321, CVE414B, CVE422
		B.12) <b>Innovate</b> systematic and methodic approaches when dealing with new and advancing technology.	BES014
		B.13) <b>Select</b> appropriate building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment	CVE111, CVE222, CVE314, CVE421, CVE424B
	neering	B.14) <b>Select</b> and design adequate water control structures, irrigation and water networks, sewerage systems and pumping stations	CVE101, CVE215, CVE223, CVE314, CVE321, CVE413, CVE414B, CVE422
	<b>Civil Engir</b>	B.15) <b>Analyze</b> and select codes of practices in designing reinforced engineering concrete and metallic structures of all types. Determine the levels, types and design systems of building foundations, tunnels and excavations	CVE111, CVE215, CVE222, CVE223, CVE313, CVE321, CVE412, CVE414A, CVE414B, CVE422
		B.16) <b>Define</b> , plan, conduct and report management techniques	CVE223, CVE324A, CVE426
		B.17) <b>Assess</b> and evaluate different techniques and strategies for solving engineering problems	CVE102, CVE112, CVE221, CVE313, CVE316, CVE322, CVE323, CVE415B
lls		C.1) <b>Apply</b> knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	BES011, BES012, BES003, BES013, PRE011, BES021, BES022, PRE021, ELE021, CVE113, BES114, BES128, CVE202, CVE213, BES214, CVE215, CVE202, CVE223, CVE313, CVE314, CVE316, CVE322, CVE324B, CVE325A, CVE412, CVE413, CVE426
ional Ski	neering	C.2) Professionally <b>merge</b> the engineering knowledge, understanding, and feedback to improve design, products and/or services.	BES014, CVE102, CVE201, CVE223, CVE301, CVE411, CVE421, CVE424A, CVE424B CVE425A
Professi	Engi	C.3) <b>Create</b> and/or re-design a process, component or system, and carry out specialized engineering designs.	CVE202, CVE215, CVE223, CVE302, CVE314, CVE321, CVE322, CVE412, CVE414B, CVE422
H		C.4) <b>Practice</b> the neatness and aesthetics in design and approach.	CVE223, CVE302, CVE411
		C.5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.	BES013 , PRE011, CVE213, CVE421, CVE424A, CVE424B

![](_page_18_Picture_0.jpeg)

Civil Engineering Department

In	tende	d Learning Outcomes (ILOs) of the program	Courses that assess in realizing ILOs
		C.6) <b>Use</b> a wide range of analytical tools, techniques, equipment, and software packages pertaining to Civil Engineering and develop required computer programs.	ELE021, CVE102, ELE127, MOE129, CVE122, CVE201, CVE214, CVE301, CVE302, CVE321, CVE414B, CVE422, CVE426
		C.7) <b>Apply</b> numerical modeling methods to engineering problems.	BES011, BES003, BES021, ELE021, CVE113, CVE122, CVE213, CVE214, CVE215, CVE223, CVE302, CVE314, CVE425A
		C.8) <b>Apply</b> safe systems at work and observe the appropriate steps to manage risks.	BES003, BES013, PRE011, PRE021, BES023, CVE411,
		C.9) <b>Demonstrate</b> basic organizational and project management skills.	CVE313, CVE316, CVE411, CVE426
		C.10) <b>Apply</b> quality assurance procedures and follow codes and standards.	BES003, CVE223, CVE321, CVE324A, CVE413, CVE414B, CVE422
		C.11) <b>Exchange</b> knowledge and skills with engineering community and industry.	PRE021, BES021, CVE316, CVE406, Summer Training, BSC. Trip, Seminar, CVE426
		C.12) <b>Prepare</b> and present technical reports.	PRE001, BES004, CVE215, CVE223, CVE414A, CVE 425B
		C.13) Use laboratory and field equipment competently and safely	CVE111, CVE112, CVE215, CVE221, CVE222, CVE314, CVE323, CVE414A, CVE415B
	ering	C.14) <b>Observe</b> , record and analyze data in laboratory and in the field	CVE 111, CVE112, CVE215, CVE221, CVE222, CVE314, CVE323, CVE324A, CVE415B, CVE421, CVE424B
	l Engine	C.15) <b>Practice</b> professionally construction management skills. Prepare technical drafts and detailed drawings both manually and using CAD	CVE101, CVE112, CVE221, CVE321, CVE323, CVE412, CVE414B, CVE415B, CVE422
	Civi	C.16) <b>carry out</b> maintenance of all types of roadways and traffic systems	CVE315, CVE421, CVE424B CVE425B
	•	C.17) <b>Prepare</b> quantity surveying reports	CVE 324A
		C.18) <b>Plan</b> , design, construct, operate, control and carry out maintenance of all types of roadways and traffic systems.	CVE315, CVE324B, CVE325A
General	Skills	D.1) Collaborate effectively within multidisciplinary team.	BES014, CVE101, CVE102, CVE112, CVE201, CVE213, CVE214, CVE215, CVE221, CVE222, CVE223, CVE301, CVE302, CVE314, CVE321, CVE322, CVE323, CVE324A, CVE411, CVE414B, CVE415B, CVE422, CVE424A, CVE425A, Summer Training

![](_page_19_Picture_0.jpeg)

Civil Engineering Department

Intended Learning Outcomes (ILOs) of the program	Courses that assess in realizing ILOs
D.2) <b>Work</b> in stressful environment and within constraints.	PRE021, BES023, CVE101, CVE102, CVE112, CVE215, CVE221, CVE223, CVE301, CVE302, CVE314, CVE316, CVE321, CVE323, CVE411, CVE414B, CVE415B, CVE422, CVE426, CVE424A, Summer Training
D.3) <b>Communicate</b> effectively.	BES011, BES012, PRE001, BES014, BES004, BES021, ELE021, CVE101, BES128, CVE215, CVE222, CVE223, CVE313, CVE314, CVE321, CVE324A, CVE413, CVE406, CVE414B, CVE422, CVE425B, Summer Training, BSC. Trip, Seminar
D.4) <b>Demonstrate</b> efficient IT capabilities.	ELE021, CVE113, CVE213, CVE214, CVE315, CVE322, CVE324A
D.5) <b>Lead</b> and <b>motivate</b> individuals.	BES003, BES013, PRE011, CVE102, CVE201, CVE301, CVE425A
<ul> <li>D.6) Effectively manage tasks, time, and resources.</li> <li>D.7) Search for information and engage in life long self learning discipline</li> </ul>	BES014, CVE102, CVE301, CVE302, CVE316, CVE411, CVE426, CVE424A BES022, CVE113, CVE202, CVE214, CVE302, CVE316, CVE324A, Seminar
D.8) <b>Acquire</b> entrepreneurial skills. D.9) <b>Refer to</b> relevant literatures.	CVE316, CVE324A, Seminar CVE202, CVE316, CVE421, CVE424B, CVE426 BES004, CVE111, BES114, ELE127, MPE129, ARC129, CVE122, BES214, CVE222, CVE313, CVE315, CVE324B, CVE325A, CVE412, CVE413, CVE414A

![](_page_20_Picture_0.jpeg)

Civil Engineering Department

Undergraduate Program

# 7- TEACHING AND LEARNING METHODS

		r	Геа	ach	ning	g ai	nd	Le	ear	nir	ng I	Me	the	ods	;							
	In	tended Learning Outcomes (ILOs) of the program	Lectures	<b>Presentations and Movies</b>	Discussions	Tutorials	Experimental	Problem solving	Brain storming	Projects	Site visits	<b>Research and Reporting</b>	Group working	Discovering	Simulation							
	I	By the end of the program, student should be able	e to	:																		
		A.1) <b>Demonstrate</b> Concepts and theories of mathematics and sciences, appropriate to Civil Engineering.	x	x	x	x		x				x										
Knowledge and Understanding		A.2) <b>Recognise</b> Basics of information and communication technology (ICT)	x	x	x	x			x				x									
		A.3) <b>Classify</b> Characteristics of engineering materials related to Civil Engineering	x	x		x																
5.0		A.4) List Principles of design including elements design, process and/or a system related to Civil Engineering.	x	x	x	x		x			x				x							
lerstanding	ing	A.5) <b>Recognise</b> Methodologies of solving engineering problems, data collection and interpretation	x	x	x	x		x	x		x	x			x							
	gineeri	A.6) <b>Remember</b> Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.	x		х	x		x		x		x										
Und	Eng	A.7) <b>Know</b> Business and management principles relevant to engineering.	x		x																	
and		A.8) Match Current engineering technologies as related to Civil Engineering.	x	x	x	x					x	x			x							
edge	-	-						A.9) Demonstrate topics related to humanitarian interests and moral issues.	х		x	x		x								
wle		A.10) Know technical language and report writing	Х	х	Х	х					x	х										
Knov		A.11) Demonstrate professional ethics and impacts of engineering solutions on society and environment	x	x	x	x		x		x	x	x										
		A.12) Select contemporary engineering topics.	Х	Х	Х	Х		Х	Х		Х	Х	Х	Х								
	Civil ngineering	A.13) Know engineering principles in the fields of reinforced concrete and metallic structures' analysis and design, geotechnics and foundations, hydraulics and hydrology, water resources, environmental and sanitary engineering, roadways and traffic systems, surveying and photogrametry	X	x	X	x		x							x							
	E	A.14) Illustrate properties, behavior and fabrication of building materials	x		x	x		x														

![](_page_21_Picture_0.jpeg)

Civil Engineering Department

				Teaching and Learning Methods													
	In	tended Learning Outcomes (ILOs) of the program	Lectures	<b>Presentations and Movies</b>	Discussions	Tutorials	Experimental	<b>Problem solving</b>	<b>Brain storming</b>	Projects	Site visits	<b>Research and Reporting</b>	Group working	Discovering	Simulation		
		A.15) Judge Projects and construction management including planning, finance, bidding and contracts															
		B.1) <b>Select</b> appropriate mathematical and computer-based methods for odelling and analyzing problems.	x		x	x	x	x				x			x		
		B.2) <b>Select</b> appropriate solutions for engineering problems based on analytical thinking.	x	x	x	x	x	x	x			x	x		x		
		B.3) <b>Think</b> in a creative and innovative way in problem solving and design.	x	x	x	x		x	x	x	x	x	x				
		B.4) <b>Combine</b> , exchange, and assess different ideas, views, and knowledge from a range of sources.	x	x	x	x		x		x		x					
	•	B.5) Assess and evaluate the characteristics and performance of components, systems and processes	x	x	x	x		x	x		x	x					
SL	ing	B.6) <b>Investigate</b> the failure of components, systems, and	x			x		x									
Skil	neer	B.7) <b>Solve</b> engineering problems, often on the basis of	x			x		x									
tual	'ngi	B.8) Select and appraise appropriate ICT tools to a	x		x	x		x	x						x		
Intellectua	H	<ul> <li>B.9) Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact</li> </ul>	x			x											
		B.10) <b>Incorporate</b> economic, societal, environmental and risk management dimensions in design	x	х		х		x									
		B.11) Analyze results of numerical models and assess	x	x	x	x	x	x				x	x		x		
		B.12) <b>Innovate</b> systematic and methodic approaches when dealing with new and advancing technology.															
	Engi neeri	B.13) Select appropriate building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment	x		x	x											

![](_page_22_Picture_0.jpeg)

#### Civil Engineering Department

Undergraduate Program

					ach	in	g a	nd	Le	ear	nir	ng I	Me	tho	ods	;
	In	ntended Learning Outcomes (ILOs) of the program	Lectures	<b>Presentations and Movies</b>	Discussions	Tutorials	Experimental	<b>Problem solving</b>	Brain storming	Projects	Site visits	<b>Research and Reporting</b>	Group working	Discovering	Simulation	
		B.14) Select and design adequate water control structures, irrigation and water networks, sewerage systems and pumping stations	x	x	x	x				x		x			x	
		B.15) Analyze and select codes of practices in designing reinforced engineering concrete and metallic structures of all types. Determine the levels, types and design systems of building foundations, tunnels and excavations	x	x	X	X		x					x			
		B.16) Define, plan, conduct and report management techniques														
		B.17) Assess and evaluate different techniques and strategies for solving engineering problems	x		x	x		x								
		C.1) <b>Apply</b> knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	x	x	x	x		x	x	x		x	x			
		C.2) Professionally <b>merge</b> the engineering knowledge, understanding, and feedback to improve design, products and/or services.	x		x	x	x	x				x			x	
		C.3) <b>Create</b> and/or re-design a process, component or system, and carry out specialized engineering designs.	x	x	x	x		x	x		x		x			
S		C.4) <b>Practice</b> the neatness and aesthetics in design and approach.	x			x										
onal Skill	leering	C.5) <b>Use</b> computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.	x	x	x	x		x	x							
ofessic	Engin	C.6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to Civil Engineering and develop required computer programs.	x		x	x		x			x	x			x	
Pr		C.7) <b>Apply</b> numerical modeling methods to engineering problems.	x	x	х	x		x				x				
		C.8) <b>Apply</b> safe systems at work and observe the appropriate steps to manage risks.	x			x		x								
		C.9) <b>Demonstrate</b> basic organizational and project management skills.	x		x	x				x		x				
		C.10) <b>Apply</b> quality assurance procedures and follow codes and standards.	x	x		x						x			x	
		C.11) <b>Exchange</b> knowledge and skills with engineering community and industry.	x		x				x		x	x	x			
		C.12) <b>Prepare</b> and present technical reports.	x	x	x	x		x								

Civil Engineering- Undergraduate program

![](_page_23_Picture_0.jpeg)

#### Civil Engineering Department

			,	Геа	ach	in	g a	nd	L	ear	nir	ng I	Me	etho	ods	1
	In	ntended Learning Outcomes (ILOs) of the program	Lectures	<b>Presentations and Movies</b>	Discussions	Tutorials	Experimental	<b>Problem solving</b>	<b>Brain storming</b>	Projects	Site visits	<b>Research and Reporting</b>	Group working	Discovering	Simulation	
		C.13) Use laboratory and field equipment competently and safely	x	x	x	x		x								
	හු	C.14) Observe, record and analyze data in laboratory and in the field	х	x	x	x	x									
	gineerin	C.15) Practice professionally construction management skills. Prepare technical drafts and detailed drawings both manually and using CAD	x	x						x	x		x			
	l Eng	C.16) carry out maintenance of all types of roadways and traffic systems														
	Civi	C.17) Prepare quantity surveying reports	х		х						x	x				
		C.18) Plan, design, construct, operate, control and carry out maintenance of all types of roadways and traffic systems.														
		D.1) <b>Collaborate</b> effectively within multidisciplinary team.	x	х	х	х		х		х	х	х	х		х	
-	-	D.2) <b>Work</b> in stressful environment and within constraints.	х		Х	Х		Х	Х	Х	х	х	Х		х	
		D.3) <b>Communicate</b> effectively.	Х	Х	Х	Х		Х	Х	Х	Х	Х		X		
		D.4) <b>Demonstrate</b> efficient IT capabilities.	х	х	Х	Х			Х		Х		X	х		
		D.5) <b>Lead</b> and <b>motivate</b> individuals.	X		Х	Х	Х	Х	Х			Х	X			
	5	D.6) Effectively <b>manage</b> tasks, time, and resources.	X		Х			X			X	X	X		х	
		D./) Search for information and engage in life-long self learning discipline.	x	x	x	x		x					x			
	-	D.8) Acquire entrepreneurial skills.	X							Х	X		X		_	
		D.9) Kerei to relevant interatures.	Х	Х	Х	Х		Х	Х	Х		Х	Х	Х		

![](_page_24_Picture_0.jpeg)

# **8- ASSESSMENT METHODS**

			Ass	sess	Me	lethods					
	Inte	nded Learning Outcomes (ILOs) of the program	Written Exam	<b>Presentations assessment</b>	Oral Exam	<b>Tutorials assessment</b>	Laboratory Test	<b>Report assessment</b>	Quiz assessment	<b>Projects assessment</b>	Model assessment
	By the	end of the program, student should be able to:									
	J	A.1) <b>Demonstrate</b> Concepts and theories of									
		mathematics and sciences, appropriate to Civil	х			х	х	х	х		
		Engineering.									
		A.2) <b>Recognise</b> Basics of information and	x		v	v	x	x	x		
		communication technology (ICT)	Λ		л	л	л	л	Λ		
		A.3) <b>Classify</b> Characteristics of engineering materials	x		x	x					
		related to Civil Engineering		-							
		A.4) List Principles of design including elements			••	••					
50		Engineering	х		х	х		х	х		х
lir	1g	<b>A</b> 5) <b>Becognise</b> Methodologies of solving engineering									
<b>n</b>	ri	problems data collection and interpretation	х		Х	Х		х	Х		Х
sta	ee	A.6) <b>Remember</b> Quality assurance systems, codes of									
er:	in	practice and standards, health and safety	x		х	х			x	х	
pq	b D	requirements and environmental issues.									
D	Ē	A.7) <b>Know</b> Business and management principles									
p		relevant to engineering.									
an		A.8) Match Current engineering technologies as	v		v	v		v	v		v
e		related to Civil Engineering.	А		л	л		л	А		Λ
βp		A.9) <b>Demonstrate</b> topics related to humanitarian	x		x	x			x		
vle		interests and moral issues.	~		Λ	Λ			^		
0		A.10) <b>Know</b> technical language and report writing	Х			Х		Х	Х		
n		A.11) <b>Demonstrate</b> professional ethics and impacts of	x		x	x		x	x	x	
		engineering solutions on society and environment									
		A.12) Select contemporary engineering topics.	Х		Х	Х			Х		Х
	<b>B</b>	A.13) <b>Know</b> engineering principles in the fields of									
	iri	analysis and design geotechnics and foundations									
	Jee	hydraulics and hydrology water resources	x		x	x	x	x	x		x
	gir	environmental and sanitary engineering.	Λ		Λ	Λ	^	Λ	Λ		Λ
	En	roadways and traffic systems, surveying and									
	il I	photogrametry									
	ïv	A.14) <b>Illustrate</b> properties, behavior and fabrication of									
	$\cup$	building materials	X		х	Х					

![](_page_25_Picture_0.jpeg)

Civil Engineering Department

				Ass	sess	sme	ent	Me	eth	ods	5
	Inte	ended Learning Outcomes (ILOs) of the program	Written Exam	Presentations assessment	<b>Oral Exam</b>	<b>Tutorials assessment</b>	Laboratory Test	Report assessment	Quiz assessment	<b>Projects assessment</b>	Model assessment
		including planning, finance, bidding and contracts	x					x	x		
		B.1) <b>Select</b> appropriate mathematical and computer- based methods for modeling and analyzing problems.	x		x	x	x	x	x		
		B.2) <b>Select</b> appropriate solutions for engineering problems based on analytical thinking.	x		x	x	x	x	x		
		B.3) <b>Think</b> in a creative and innovative way in problem solving and design.	x		x	x		x	x		
		B.4) <b>Combine</b> , exchange, and assess different ideas, views, and knowledge from a range of sources.	x			x		x	x	x	
	ing	B.5) Assess and evaluate the characteristics and performance of components, systems and processes.	x		x	x		x	x		x
lls	ıeer	B.6) <b>Investigate</b> the failure of components, systems, and processes.	x			x		x			
l Ski	ngiı	B.7) <b>Solve</b> engineering problems, often on the basis of limited and possibly contradicting information.	x			X		X			
ctua	H	B.8) <b>Select and appraise</b> appropriate ICT tools to a variety of engineering problems.	x		x	x	X	X			
Intelle		B.9) <b>Judge</b> engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.	X			X					
[		B.10) <b>Incorporate</b> economic, societal, environmental and risk management dimensions in design.	x		X	X					X
		B.11) Analyze results of numerical models and assess their limitations.	x		x	X		X	x		
		B.12) <b>Innovate</b> systematic and methodic approaches when dealing with new and advancing technology.									
	ivil 1eerin 1	<ul> <li>B.13) Select appropriate building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment</li> </ul>	x		x						
	Ci Engir	B.14) Select and design adequate water control structures, irrigation and water networks, sewerage systems and pumping stations	x		x	x		X	X	X	

![](_page_26_Picture_0.jpeg)

Civil Engineering Department

			Assessment Methods									
	Inte	ended Learning Outcomes (ILOs) of the program	Written Exam	Presentations assessment	Oral Exam	<b>Tutorials assessment</b>	Laboratory Test	Report assessment	Quiz assessment	<b>Projects assessment</b>	Model assessment	
		B.15) <b>Analyze</b> and select codes of practices in designing reinforced engineering concrete and metallic structures of all types. Determine the levels, types and design systems of building foundations, tunnels and excavations	X		Х	х			X			
		B.16) <b>Define</b> , plan, conduct and report management techniques	х									
		B.17) Assess and evaluate different techniques and strategies for solving engineering problems	X		X	X	X					
		C.1) <b>Apply</b> knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems.	x		x	x	x		x			
		C.2) Professionally <b>merge</b> the engineering knowledge, understanding, and feedback to improve design, products and/or services.	x			x		x	x			
		C.3) <b>Create</b> and/or re-design a process, component or system, and carry out specialized engineering designs.	X		X	x		x	x	x		
S		C.4) <b>Practice</b> the neatness and aesthetics in design and approach.	x									
nal Skill	eering	C.5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.	x		x	x				x		
Professio	Engin	C.6) <b>Use</b> a wide range of analytical tools, techniques, equipment, and software packages pertaining to Civil Engineering and develop required computer programs.	х			х		x	x			
Γ		C.7) <b>Apply</b> numerical modeling methods to engineering problems.	x		х	x	x	x	x	x		
		C.8) <b>Apply</b> safe systems at work and observe the appropriate steps to manage risks.	x			x						
		C.9) <b>Demonstrate</b> basic organizational and project management skills.	x					x	x			
		C.10) <b>Apply</b> quality assurance procedures and follow codes and standards.	x			x		x	x			
		C.11) <b>Exchange</b> knowledge and skills with engineering community and industry.	x					x	x			
		C.12) <b>Prepare</b> and present technical reports.	х			x						

![](_page_27_Picture_0.jpeg)

Civil Engineering Department

				Ass	sess	sme	ent	Me	etho	ods	}
	Inte	nded Learning Outcomes (ILOs) of the program	Written Exam	<b>Presentations assessment</b>	Oral Exam	<b>Tutorials assessment</b>	Laboratory Test	<b>Report assessment</b>	Quiz assessment	<b>Projects assessment</b>	Model assessment
		C.13) Use laboratory and field equipment competently and safely	X		x	x			x		
		C.14) <b>Observe</b> , record and analyze data in laboratory and in the field	х		x						
	neering	C.15) <b>Practice</b> professionally construction management skills. Prepare technical drafts and detailed drawings both manually and using CAD	х			x		x	x	x	
	Engiı	C.16) <b>carry out</b> maintenance of all types of roadways and traffic systems									
	livi!	C.17) <b>Prepare</b> quantity surveying reports	x						x		
	0	C.18) <b>Plan</b> , design, construct, operate, control and carry out maintenance of all types of roadways and traffic systems.									
	<u>.</u>	D.1) <b>Collaborate</b> effectively within multidisciplinary team.	x			x	x	x	-	x	
		D.2) <b>Work</b> in stressful environment and within constraints.	x			x		x	x	x	
		D.3) Communicate effectively.	х	х	х	х		х		х	
240	ill	D.4) <b>Demonstrate</b> efficient IT capabilities.		X	X		х	Х			
2	Sk	D.5) Lead and motivate individuals.	X					Х	х		
ζ	5 0	D.6) Effectively <b>manage</b> tasks, time, and resources.	X			х		X	х		
		D.7) <b>Search for</b> information and engage in life-long self learning discipline.	x	x	x	x	x	x	x		
		D.8) Acquire entrepreneurial skills.	Χ					Х	Х		
		D.9) <b>Keter to</b> relevant literatures.		Х	Х			Х			

![](_page_28_Picture_0.jpeg)

#### Hours distribution according to NARS categorization

	Course name	Total hours (lectures+tutorials/lab.)	Humanities and Social Sciences	Mathematics and Basic Sciences	Basic Engineering Sciences	Applied Engineering and Design, Projects and Practice, Discretionary subjects	Computer Applications and ICT
Prenarator	v Year		HSS	MBS	BES	AED	CAICI
RES 011	Mathematics (1-A)	6	0	6	0	0	0
BES 012	Physics (1-A)	5	0	5	0	0	0
BES 003	Mechanics	4	0	4	0	0	0
BES 013	Chemistry /		0			0	
PRE 011	Production Engineering	4	0	4	0	U	0
PRE 001	Engineering Drawing & Projection	6	0	6	0	0	0
BES 014	History of Eng- Sciences	3	3	0	0	0	0
BES 004	English Language.	2	2	0	0	0	0
BES 021	Mathematics (1-B)	6	0	6	0	0	0
BES 022	Physics (1-B)	5	0	5	0	0	0
BES 003	Mechanics	4	0	4	0	0	0
PRE 021	Production Engineering /		0	4	0	0	0
BES 023	Chemistry	4	0	4	0	0	U
PRE 001	Engineering Drawing & Projection	6	0	6	0	0	0
ELE 021	Computer and Programming	3	0	0	0	0	3
BES 004	English Language	2	2	0	0	0	0
1 <sup>st</sup> year civ	vil		HSS	MBS	BES	AED	CAICT
CVE 101	Civil Engineering Drawing	4	0	0	4	0	0
CVE 102	Theory of Structures (1)	4	0	0	4	0	0
CVE 111	Strength and Properties of	6	2	0	4	0	0
	Materials (1)						
	Surveying (1)	6	1	0	4	0	1
CVE 113	Computer Applications (1)	4	0	0	0	0	4
BES 114	Mathematics (2)	6	0	6	0	0	0
CVE 101	Civil Engineering Drawing	4	0	0	4	0	0
CVE 102	Theory of Structures (1)	4	0	0	4	0	0
ELE 127	Electrical Engineering	3	0	3	0	0	0
MPE 129	Mechanical Engineering	3	0	3	0	0	0
ARC 129	Building Construction	6	0	0	6	0	0

Civil Engineering- Undergraduate program

![](_page_29_Picture_0.jpeg)

Civil Engineering Department

CVE 122	Engineering Geology	4	2	2	0	0	0
BES 128	Physics (2)	6	0	6	0	0	0
2nd Year			HSS	MBS	BES	AED	CAICT
CVE 201	Theory of Structures (2)	4	0	0	3	0	1
CVE 202	Reinforced Concrete Structures	4	0	0	0	3	1
	(1)	-	U	0	0	5	-
CVE 213	Soil Mechanics	6	0	0	6	0	0
BES 214	Mathematics (3)	6	0	6	0	0	0
CVE 214	Computer Applications (2)	4	0	0	0	0	4
CVE 215	Hydraulics (2)	6	0	0	6	0	0
CVE 201	Theory of Structures (2)	4	0	0	3	0	1
CVE 202	Reinforced Concrete Structures		0	0	•		0
	(1)	4	0	U	0	4	0
CVE 221	Topographic Surveying	8	2	0	0	0	2
CVE 222	Strength and Properties of	0	2	0	F	0	4
	Materials (2)	Ö	2	U	Э	0	I
CVE 223	Irrigation and Drainage	6	0	0	6	0	0
							-
3 <sup>rd</sup> year ci	vil		HSS	MBS	BES	AED	CAICT
<b>3<sup>rd</sup> year ci</b> CVE 301	<b>vil</b> Theory of Structures (3)	4	<b>HSS</b> 0	<b>MBS</b> 0	<b>BES</b> 3	<b>AED</b> 0	CAICT
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302	<b>vil</b> Theory of Structures (3) Reinforced Concrete Structures	4	<b>HSS</b> 0	<b>MBS</b> 0	<b>BES</b> 3	<b>AED</b> 0	CAICT 1
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302	vil Theory of Structures (3) Reinforced Concrete Structures (2)	4	<b>HSS</b> 0	<b>MBS</b> 0 0	<b>BES</b> 3	<b>AED</b> 0 3	CAICT 1 1
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 CVE 313	vil Theory of Structures (3) Reinforced Concrete Structures (2) Steel Structures (1)	4 4 3	HSS 0 0 0	MBS           0           0           0           0	<b>BES</b> 3 0 0	AED           0           3           3	<b>CAICT</b> 1 1 0
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 CVE 313 CVE 314	vil Theory of Structures (3) Reinforced Concrete Structures (2) Steel Structures (1) Hydraulics (2)	4 4 3 6	HSS 0 0 0	MBS           0           0           0           0           0           0	<b>BES</b> 3 0 0 6	AED 0 3 3 0	CAICT 1 1 0 0
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 CVE 313 CVE 314 CVE 315	vilTheory of Structures (3)Reinforced Concrete Structures(2)Steel Structures (1)Hydraulics (2)Traffic and Transportation	4 4 3 6 7	HSS 0 0 0 0 0	MBS           0           0           0           0           0           0           0           0	BES 3 0 0 6 5	AED 0 3 3 0 0	CAICT 1 1 0 0 2
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 CVE 313 CVE 314 CVE 315 CVE 316	vilTheory of Structures (3)Reinforced Concrete Structures(2)Steel Structures (1)Hydraulics (2)Traffic and TransportationLegislations and Contracts	4 4 3 6 7 2	HSS 0 0 0 0 0 0 2	MBS           0           0           0           0           0           0           0           0           0           0	BES 3 0 0 6 5 0	AED 0 3 3 0 0 0 0	CAICT 1 1 0 0 2 0
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 CVE 313 CVE 314 CVE 315 CVE 316 CVE 324	vilTheory of Structures (3)Reinforced Concrete Structures(2)Steel Structures (1)Hydraulics (2)Traffic and TransportationLegislations and ContractsElective Course (1)	4 4 3 6 7 2 4	HSS 0 0 0 0 0 0 2 0	MBS           0           0           0           0           0           0           0           0           0           0           0           0           0           0	BES 3 0 0 6 5 0 0	AED 0 3 3 0 0 0 0 4	CAICT 1 1 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 CVE 313 CVE 314 CVE 315 CVE 316 CVE 324 CVE 301	vilTheory of Structures (3)Reinforced Concrete Structures (2)Steel Structures (1)Hydraulics (2)Traffic and TransportationLegislations and ContractsElective Course (1)Theory of Structures (3)	4 4 3 6 7 2 4 4	HSS 0 0 0 0 0 0 2 0 0 0	MBS           0	BES 3 0 0 6 5 0 0 0 3	AED 0 3 3 0 0 0 0 4 0	CAICT 1 1 0 0 2 0 0 1 1
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 CVE 313 CVE 314 CVE 314 CVE 315 CVE 316 CVE 324 CVE 301 CVE 302	vilTheory of Structures (3)Reinforced Concrete Structures(2)Steel Structures (1)Hydraulics (2)Traffic and TransportationLegislations and ContractsElective Course (1)Theory of Structures (3)Reinforced Concrete Structures	4 4 3 6 7 2 4 4 4	HSS 0 0 0 0 0 2 0 0 0 0	MBS           0	BES 3 0 0 6 5 0 0 3 0	AED 0 3 3 0 0 0 0 4 0 3	CAICT 1 1 0 0 2 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 <b>CVE 313</b> CVE 314 CVE 315 CVE 316 CVE 324 CVE 301 CVE 302	vil Theory of Structures (3) Reinforced Concrete Structures (2) Steel Structures (1) Hydraulics (2) Traffic and Transportation Legislations and Contracts Elective Course (1) Theory of Structures (3) Reinforced Concrete Structures (2)	4 4 3 6 7 2 4 4 4	HSS 0 0 0 0 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0	MBS         0	BES 3 0 0 6 5 0 0 3 0 0	AED 0 3 0 0 0 0 4 0 3	CAICT 1 1 0 0 0 2 0 0 1 1 1 1
<b>3</b> <sup>rd</sup> <b>year ci</b> CVE 301 CVE 302 CVE 313 CVE 314 CVE 315 CVE 316 CVE 324 CVE 301 CVE 302 CVE 321	vilTheory of Structures (3)Reinforced Concrete Structures(2)Steel Structures (1)Hydraulics (2)Traffic and TransportationLegislations and ContractsElective Course (1)Theory of Structures (3)Reinforced Concrete Structures(2)Irrigation Structures Design	4 4 3 6 7 2 4 4 4 4	HSS 0 0 0 0 0 2 0 0 0 0 0 0	MBS         0	BES 3 0 0 6 5 0 0 3 0 0 0 0	AED 0 3 3 0 0 0 0 4 0 3 4	CAICT 1 1 0 0 2 0 1 1 1 1 1 1 0 0 0 1 1 1 0
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 CVE 313 CVE 314 CVE 315 CVE 316 CVE 324 CVE 301 CVE 302 CVE 321 CVE 322	vilTheory of Structures (3)Reinforced Concrete Structures (2)Steel Structures (1)Hydraulics (2)Traffic and TransportationLegislations and ContractsElective Course (1)Theory of Structures (3)Reinforced Concrete Structures (2)Irrigation Structures DesignSoil Mechanics and Foundation	4 4 3 6 7 2 4 4 4 4 4 6	HSS 0 0 0 0 0 2 0 0 0 0 0 0 0 0	MBS         0	BES 3 0 0 6 5 0 0 3 0 0 0 0 0 0	AED         0         3         3         0         0         0         0         0         3         4         6	CAICT 1 1 0 0 2 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 CVE 313 CVE 314 CVE 315 CVE 316 CVE 324 CVE 301 CVE 302 CVE 322 CVE 322 CVE 323	vilTheory of Structures (3)Reinforced Concrete Structures(2)Steel Structures (1)Hydraulics (2)Traffic and TransportationLegislations and ContractsElective Course (1)Theory of Structures (3)Reinforced Concrete Structures(2)Irrigation Structures DesignSoil Mechanics and FoundationGeodesy	4 4 3 6 7 2 4 4 4 4 4 6 4	HSS 0 0 0 0 0 2 0 0 0 0 0 0 0 0 0 1	MBS         0	BES 3 0 0 6 5 0 0 3 0 0 0 0 3 3	AED 0 3 3 0 0 0 0 4 0 3 4 6 0 0	CAICT 1 1 0 0 2 0 1 1 1 1 0 0 0 1 1 1 0 0 0 0
<b>3<sup>rd</sup> year ci</b> CVE 301 CVE 302 <b>CVE 313</b> CVE 314 CVE 314 CVE 315 CVE 316 CVE 324 CVE 301 CVE 302 CVE 322 CVE 323 CVE 313	vilTheory of Structures (3)Reinforced Concrete Structures (2)Steel Structures (1)Hydraulics (2)Traffic and TransportationLegislations and ContractsElective Course (1)Theory of Structures (3)Reinforced Concrete Structures (2)Irrigation Structures DesignSoil Mechanics and FoundationGeodesySteel Structures (1)	4 4 3 6 7 2 4 4 4 4 4 6 4 4	HSS 0 0 0 0 0 2 0 0 0 0 0 0 0 0 0 1 0 0	MBS         0	BES 3 0 0 6 5 0 0 3 0 0 0 3 0 3 0 3 0	AED         0         3         3         0         0         0         0         4         6         0         3	CAICT 1 1 0 0 2 0 0 1 1 1 0 0 0 0 0 1 1 1 0 0 0 0

![](_page_30_Picture_0.jpeg)

#### Civil Engineering Department

#### Undergraduate Program

4 <sup>th</sup> year	r <b>civil</b>		HSS	MBS	BES	AED	CAICT
CVE 411	Reinforced Concrete Structures (3)	3	0	0	0	3	0
CVE 412	Foundation Engineering	6	0	0	0	6	0
CVE 413	Sanitary and Environmental Engineering	6	2	0	0	3	1
CVE 423	Steel Structures (2)	3	0	0	0	3	0
CVE 406	B. Sc. Graduation Project	4	1	0	0	2	1
CVE 414	Elective Course ( 3 )	4	0	0	0	4	0
CVE 415	Elective Course ( 4 )	4	0	0	0	4	0
CVE 421	Highway and Airport Engineering	6	0	0	0	6	0
CVE 422	Irrigation Structures Design	4	0	0	0	4	0
CVE 423	Steel Structures (2)	3	0	0	0	3	0
CVE 411	Reinforced Concrete Structures (3)	3	0	0	0	3	0
CVE 426	Feasibility Studies and Project Management	2	2	0	0	0	0
CVE 406	B. Sc. Graduation Project	4	1	0	0	2	1
CVE 424	Elective Course ( 5 )	4		0	0	4	0
CVE 425	Elective Course ( 6 )	4	2	0	0	2	0
	Total	300	27	76	83	86	28
			HSS	MBS	BES	AED**	CAICT
	NARS Lower limit		9	20	20	28	9
	Percentage CIVIL		9	25.3	27.67*	28.67*	9.33
	NARS upper limit	1000/	12	26	23	32	11
	INARS IIIedii	100%	11	21	21	30	10

\*6-8% Discretionary percent were used to cover program need BES and AED

\*\* AED cited herein includes hours for projects and practice

![](_page_31_Picture_0.jpeg)

		HSS	MBS	BES	AED	CAICT
Elective Course (1) CVE 324	4					
CVE324A Strength and properties Of Engineering Materials (3)					4	
CVE324B Railway Engineering (1)					4	
Average					4	
Elective Course (2) CVE 325	4					
CVE 325A Railway Engineering (2)					4	
CVE325B Hydrology					4	
Average					4	
Elective Course (3) CVE 414	4					
CVE414A Geotechnical Engineering and Foundations (2)					4	
CVE414B Design and Construction of Ports and Marine Structures.					4	
Average					4	
Elective Course ( 4 ) CVE 415	4					
CVE 415A Steel Structures (3).					4	
CVE 415B Advanced Geodesy.					4	
Average						
Elective Course (5) CVE 424	4					
CVE 424A Reinforced Concrete (4)					4	
CVE424B Highway and					4	
Transportation Engineering					4	
Average					4	
Elective Course (6) CVE 425	4					
CVE 425A Theory of Structures (4)					4	
CVE 425B Environmental Engineering		4				
Average		2			2	

![](_page_32_Picture_0.jpeg)

#### Table below shows the comparision between the Program and NARS indicative Curriculacon tent by subject area:

Subject Area	NARS	Program Characterization	
	%	Tolerance %	%
Humanities and Social Sciences (Univ. Req.)	11	9-12	9
Mathematic and Basic Sciences	21	20-26	25.3
Basic Engineering Sciences (Faculty /spec. Req.)	21	20-23	27.7
Applied Engineering and Design	21	20-22	28.7
Computer Application and ICT	10	9-12	9.3
Projects and Practice	9	8-10	Included in Design
Subtotal	93	92-94	
Discretionary (institution character-identifying )	7	6-8	Included in Design
Subjects			
Total	100%	100%	100%

# Note : Program characterization% = [total hrs of subject area /total hr of program ] $\times$ 100

![](_page_32_Figure_5.jpeg)

![](_page_33_Picture_0.jpeg)

	Pro le	gram evel	Ho	urs / we	ek	Total	Total h	nrs/week
ucture	year	Semester	Lecturers	Tutorials	Practical	hrs	Compulsory	Elective
itr	Pre	1st	15	11	4	30	30	0
n s		2nd	15	10	5	30	30	0
ar.	1st	3rd	15	10	5	30	30	0
Igu		4th	13	15	2	30	30	0
Pr(	2nd	5th	17	9	4	30	30	0
H		6th	16	10	4	30	30	0
	3rd	7th	18	10	2	30	26	4
		8th	17	12	1	30	26	4
	4th	9th	18	11	1	30	22	8
		10th	17	12	1	30	22	8
Т	otal hours		161	110	29	300	276	24
P	Percentage		53.67	36.67	9.67	100%	92	8

![](_page_33_Figure_3.jpeg)

Distribution of total hrs during the period of the program

based on teaching methods

![](_page_34_Picture_0.jpeg)

![](_page_34_Figure_2.jpeg)

Distribution of total hours on courses basis

![](_page_35_Picture_0.jpeg)

# 9- PROGRAM STRUCTURE

Perio	od of Study	/ <b>''5 ye</b>	ars''								
	Hours	161	lectures	110	tutoria	29	Lab	139	Practice	300	Total
	110015	276	Cor	npulsory	24	Ele	ctive		300		Total
		.:		Color and	No.	-	%				
	• Humar	nues an	la Social	Sciences	27		9				
Jre				~ •	No.	(	%				
ructi	• Mathe	matics a	and Basic	Sciences	76	2:	5.3				
n sti		No. %									
ograi	Basic I	nces,	83	2'	27.7						
Pre	• Applied Engineering and Design,				No.	0	%				
	Projects a subjects*	nd Prac	iscretionary	86	2	8.7					
							%				
	• Compu	iter Apj	plications	s and ICT	29 9.3						
	Student		H	Hours distribution							
	should pass		C	ompulsory			ŀ	Electiv	e		Iotai
evels	• Prepa year	ratory		60			0				60
m L	• 1 <sup>st</sup> yea	ar		60				0			60
ogra	• $2^{nd}$ ye	ar		60				0			60
Pr	• 3 <sup>rd</sup> yea	ar		52				8			60
	• 4 <sup>th</sup> yea	ar		44				16			60
	То	tal		276				24			300
Projects and practice hours added (as hours and percentage to AED due to the close types of both in the civil Engineering department											

![](_page_36_Picture_0.jpeg)

# a. Compulsory Courses

Code	Course	Units		Hours	/ week		Level	Semester	
Coue	Course	Units	Lecture	Tutorials	Lab.	Total	Level	Semester	
BES 011	Mathematics (1-A)		4	2	-	6			
BES 012	Physics (1-A)		3	-	2	5			
BES 003	Mechanics		2	2	-	4			
BES 013	Chemistry /		2	-	2	4	Preparatory	$1^{st}$	
PRE 011	Production Engineering		_				year	semester	
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			
BES 022	Physics (1-B)		3	-	2	5			
BES 003	Mechanics		2	2	-	4			
PRE 021	Production Engineering /		2		2	4	Preparatory	$2^{nd}$	
BES 023	Chemistry		2	-	Z	4	year	semester	
PRE 001	Engineering Drawing & Projection		2	4	-	6			
ELE 021	Computer and Programming		2	-	1	3			
BES 004	English Language		-	2	-	2			
CVE 101	Civil Engineering Drawing		1	3	-	4			
CVE 102	Theory of Structures (1)		2	2	-	4		1 <sup>st</sup>	
CVE 111	Strength and Properties of Materials (1)		3	1	2	6	1 <sup>st</sup> year		
CVE 112	Surveying (1)		3	2	1	6		semester	
CVE 113	Computer Applications (1)		2	-	2	4			
BES 114	Mathematics (2)		4	2	-	6			
CVE 101	Civil Engineering Drawing		1	3	-	4			
CVE 102	Theory of Structures (1)		2	2	-	4			
ELE 127	Electrical Engineering		2	1	-	3			
MPE 129	Mechanical Engineering		2	1	-	3	1 <sup>st</sup> year	2 <sup>nd</sup>	
ARC 129	Building Construction		1	5	-	6		semester	
CVE 122	Engineering Geology		2	2	-	4			
BES 128	Physics (2)		3	1	2	6			
CVE 201	Theory of Structures (2)		2	2	-	4			
CVE 202	Reinforced Concrete Structures (1)		2	2	_	4			
CVE 213	Soil Mechanics		4	1	1	6		1 <sup>st</sup>	
BES 214	Mathematics (3)		4	2	_	6	$2^{nd}$ year	semester	
CVE 214	Computer Applications (2)		2	_	2	4			
CVE 215	Hydraulics (2)		3	2	1	6			
CVF 201	Theory of Structures (2)		2	2		4			
CVE 202	Reinforced Concrete Structures (1)		2	2	_	4			
CVE 202	Topographic Surveying		2 	2	2	۲ 8		and	
	Strength and Properties of		-	<u> </u>		5	2 <sup>nd</sup> year	2 <sup>nd</sup> semester	
CVE 222	Materials (2)		4	2	2	8		semester	
CVE 223	Irrigation and Drainage		4	2	-	6			

![](_page_37_Picture_0.jpeg)

#### Civil Engineering Department

Codo	Course	Unita		Hours	/ week		Loval	Somostor		
Code	Course	Units	Lecture	Tutorials	Lab.	Total	Level	Semester		
CVE 301	Theory of Structures (3)		2	2	-	4				
CVE 302	Reinforced Concrete Structures (2)		2	2	-	4				
CVE 313	Steel Structures (1)		4	3	-	7				
CVE 314	Hydraulics (2)		4	1	1	6	3 <sup>rd</sup> vear	1 <sup>st</sup>		
CVE 315	Traffic and Transportation		4	2	1	7	e year	semester		
CVE 316	Legislations and Contracts		2	-	-	2				
CVE 324	Elective course (1)		3	1	-	4				
CVE 301	Theory of Structures (3)		2	2	-	4				
CVE 302	Reinforced Concrete Structures (2)		2	2	-	4				
CVE 321	Irrigation Structures Design		2	2	-	4	ard	2 <sup>nd</sup>		
CVE 322	Soil Mechanics and Foundation		4	1	1	6	3 year	semester		
CVE 323	Geodesy		2	2	_	4				
CVE 325	Elective course (2)		3	1	-	4				
CVE 411	Reinforced Concrete Structures (3)		4	2	-	6				
CVE 412	Foundation Engineering		4	2	-	6				
CVE 413	Sanitary and Environmental Engineering		4	1	1	6	4 <sup>th</sup> vear	1 <sup>st</sup>		
CVE 406	B. Sc. Graduation Project		-	4	-	4	+ year	semester		
CVE 414	Elective course (3)		3	1	-	4				
CVE 415	Elective course (4)		3	1	-	4				
CVE 421	Highway and Airport Engineering		3	2	1	6				
CVE 422	Irrigation Structures Design		2	2	-	4				
CVE 423	Steel Structures (2)		4	2	_	6				
CVE 426	Feasibility Studies and Project		2	-	_	2	4 <sup>th</sup> year	2 <sup>nd</sup>		
	ivianagement							semestel		
	B. Sc. Graduation Project			4	-	4				
	Elective Course (5)		3	1	-	4				
UVE 425	Elective Course (6)		3	1	-	4				

![](_page_38_Picture_0.jpeg)

# **b.** Elective:

Codo	Course	Unita		Hours / weel	k	Loval	Somestor
Code	Course	Units	Lecture	Tutorial	Total	Level	Semester
CVE 324A	Strength and properties Of Engineering Materials (3)		3	1	4		1 <sup>st</sup>
CVE 324B	Railway Engineering (1)		3	1	4	3 <sup>rd</sup> year	semester
CVE 325A	Railway Engineering (2)		3	1	4		$2^{nd}$
CVE 325B	Hydrology of Drawing Water		3	1	4		semester
CVE 414A	Geotechnical Engineering and Foundations (2)		3	1	4		
CVE 414B	Design and Construction of Ports and Marine Structures.		3	1	4		1 <sup>st</sup> semester
CVE 415A	Steel Structures (3).		3	1	4		
CVE 415B	Advanced Geodesy.		3	1	4	4 <sup>th</sup> vear	
CVE 424A	Reinforced Concrete (4)		3	1	4	<u> </u>	
CVE 424B	Highway and Transportation Engineering		3	1	4		2 <sup>nd</sup>
CVE 425A	Theory of Structures (4)		3	1	4		semester
CVE 425B	Environmental Engineering		3	1	4		

![](_page_39_Picture_0.jpeg)

#### 10- COURSE CONTENTS

#### **Preparatory Year**

DEC 011 . Mathematics (1 A)	Lecture	Tutorial	Lab	total
<b>BES 011 : Mathematics (1-A)</b>	4	2	-	6

Functions and and Elementary Functions, Limits and Continuity. Derivatives and partial derivative, Application of derivative, Polar, Cylindrical, and spherical coordinate in vector space, Equation of second degree General equation of conic section-properties of conic section (Parabola – ellipse – hyperbola) Transformation and rotation of axes, Equation of two lines – equation of sphere and surface of revolution Equation of planes and straight lines in space

	Lecture	Tutorial	Lab	total
BES 012 : Physics (1-A)	3	-	2	5

Units and Dimensions - Gravitation, Newton's law, kepler's law, gravitational force, field and potentental -Elastic properties of solid, Hook's law, elasticity modulus and its types -Fluid mechanics, pressure, fluid statics, Fluid dynamics, Bernoulli's equitation and its a application -Temperature; Thermometers, Zero law of thermodynamics, Thermal expansion -Heat and first law of thermodynamics and its application -Kinetic theory of gases -Heat engines, Entropy and second law of thermodynamics -Geometrical optics, reflection and refraction, image formation.

	Lecture	Tutorial	Lab	total
DES 005: Mechanics	2	2	-	4

Introduction to statics, Mechanics, Newton's three laws of motion and gravitational attraction, moment of force, replacement of a force by a force and couple.- Force Vector, Force resultant in two dimensions, scalar and vectors, types of vectors, operations on vectors -Parallelogram law, addition of rectangular force components, the dot and cross product, - Force resultant in three dimensions, (converging and non-converging forces) Plane system of converging forces, The composition of two forces applied at a single point, the projection of a geometric sum of vectors on an axis - An analytical method for determination of a resultant of a plane system of converging forces, a theorem on the equilibrium of three non parallel forces lying in one plane - Plane system of non-converging forces, the composition of two parallel forces acting in the same direction, the composition of two forces unequal in magnitude and acting in opposite direction - Non-concurrent coplanar forces, methods for determining the resultant, analytical methods and graphical method (Funicular or string polygon), conditions for equilibrium for system of non-converging forces.

![](_page_40_Picture_0.jpeg)

#### Civil Engineering Department

#### Undergraduate Program

BES 013 Chemistry	Lecture	Tutorial	Lab	total
	2	-	2	4

The Gaseous State - Mass and heat balance in Fuel Combustion - Electrochemistry & Corrosion. - Properties of Solutions & Alloys - Treatment of Water- Air Pollution - Dynamic Equilibrium in Physical & Chemical Processes- Building materials-Petrochemicals- Polymers

DDE 011. Due due 4 au Tracher als au	Lecture	Tutorial	Lab	total
PRE 011: Production Technology	2	-	2	4

workshop safety - Fundamentals of Engineering Materials - Casting processes-Forming processes (Rolling – Drawing ,Extrusion , Spinning ) - Welding processes - Bench work (Measurement , Filling ,Taping , Drilling , Sawing ) - Metal Machining - principles (Turning – Milling – Shaping – Drilling – Grinding )

PRE 001: Engineering Drawing &	Lecture	Tutorial	Lab	total
Projection	2	4	-	6

Drawing Instruments - Geometric constructions - Introduction of Engineering drawing -Geometrical constructions -Orthographic projections of Eng. Bodies Isometric of bodies-Mechanical joints - Construction of Isometric from projection - Assembly drawing and sectional projection - Projection of point, lines and planes - Steel structure are joints -Orthographic or Multi-view projection -Isometric projection - Drawing the sections in parts -Drawing steel sections

BES 014 History of Engineering.	Lecture	Tutorial	Lab	total
Sciences	2	1	-	3

Identification of Arts, Sciences, Technology and Engineering - Civilization development and their relation with natural and human sciences- History of Technology in different aspects-Historical relation between cience and technology- The relation between engineering development and Environmental development. (social aspects of civilization) xamples of development in different engineering activities

PES 004 English Language	Lecture	Tutorial	Lab	total
DES 004 English Language	-	2	-	2

Introduction to Scientific Statements - Be and have in scientific statements - Statements requiring the Present Simple - Exercises - Dimensions and Properties - Dimensions - Properties - 'Fronted' statements Qualified Statements of Dimensions - Exercises - Comparisons and Modals -imple statements of comparison - Qualified comparative statements - A note on modals in scientific English - Impersonal Scientific Statements - The Passive Form of the passive - Use of the passive - By and the agent - Must, should, and the passive - Passives and infinitives - Passive and active Technical Readings - Four different Engineering topics

![](_page_41_Picture_0.jpeg)

Menoufia University Civil Engineering Department

#### Undergraduate Program

	Lecture	Tutorial	Lab	total
BES 021 Mathematics(1-b)	4	2	-	6

Indefinite Integral - Definite Integral - Application of Integration- Numerical method of integration .- Polar, Cylindrical, and spherical coordinate in vector space - Equation of second degree General equation of conic section-properties of conic section (Parabola – ellipse – hyperbola)- Transformation and rotation of axes Equation of two lines – equation of sphere and - surface of revolution

$\mathbf{DEC} (\mathbf{A} \mathbf{A} \mathbf{D} \mathbf{D} \mathbf{D} \mathbf{D} \mathbf{D} \mathbf{D} \mathbf{D} D$	Lecture	Tutorial	Lab	total
DES 022 Flysics (I-D)	3	-	2	5

Modern physics; Blackbody radiation, photoelectric effect, binding in solids, band theory of solid, energy band- Electric field; electric charge, coulomb's law, electric field . - Gauss law; electric flux, Gauss's law and its application - Electric potential; for point charge, charged body .- Capacitance and dielectric, definition and its calculating .- Current and Resistance; Variation of resistivity . Magnetic field and sources; Magnetic forces, Biot – Sarant law Ampere's law, magnetic flux, Gauss's law of magnetism. - Farady's law, induction, induced emf, generators and motors - Magnetism and matter, Dia , Para -, and Ferromagnetic materials

PES 003. Machanica	Lecture	Tutorial	Lab	total
DES 005: Mechanics	2	2	-	4

Plane trusses, simple truss, stresses, Bow's notation, support reactions and free body diagram, zero force members, methods for solving the trusses - Analytical method of isolated joints. Methods of sections- Cantilever truss and graphical methods -Frames and machines, applications for equations of equilibrium- Friction, types of friction, the laws of sliding friction and the laws of rolling friction.- Introduction to dynamics, Background, basic concepts, Newton's laws, engineering and mechanics, and methods for solving problems. -Kinematics of particles, 1. rectilinear motion, basic concepts such as position, velocity, and acceleration, distance, displacement and speed - Determination of the motion of the particle.-Graphical solution of rectilinear motion -Curvilinear motion, Basic concepts, position vector, velocity and acceleration. Rectangular components of the velocity and acceleration -Application on the rectangular components of velocity and acceleration, Projectiles. -Tangential and normal components, radial and transverse components of the velocity and acceleration, cylindrical and spherical coordinate - Motion of several particles, dependent motion and relative motion of two particles - Kinematics of particles, Newton's second law of motion, Linear momentum of a particle, systems of units, and equations of motion in rectangular coordinates including friction force -Newton's second law of motion in tangential and normal components and radial and transverse components. - Work of a force, work exerted by constant force, weight force, spring force, and principle of work and energy. Power and efficiency - Oblique central impact

![](_page_42_Picture_0.jpeg)

#### Civil Engineering Department

#### Undergraduate Program

	Lecture	Tutorial	Lab	total
PRE 021 Production Engineering	2	-	2	4

workshop safety - Fundamentals of Engineering Materials - Casting processes-Forming processes (Rolling – Drawing ,Extrusion , Spinning) - Welding processes - Bench work (Measurement , Filling ,Taping , Drilling , Sawing) - Metal Machining - principles (Turning – Milling – Shaping – Drilling – Grinding )

	Lecture	Tutorial	Lab	total
BES 025 Chemistry	2	-	2	4

The Gaseous State - Mass and heat balance in Fuel Combustion - Electrochemistry & Corrosion. - Properties of Solutions & Alloys - Treatment of Water - Air Pollution -Dynamic Equilibrium in Physical & Chemical Processes - Building materials - Petrochemicals-Polymers.

	Lecture	Tutorial	Lab	total
ELE 021 Computers and programming	2	-	1	3

Introduction - Types of coputer and their features-classification of computers –computer generation-historical development of computers. - COMPUTER HARDWARE - Hardware components – CPU – input devices(key board, mouse, ..etc) – output devices(Printer, scanner,..etc) - Ports- units of measuring computer size - COMPUTER SOFTWARE - Classification of software- Operating systems- Application software0 Software generation. – DOS - Basic differences between command line interface and GUI – DOS commands – Error messages. - NUMBERING SYSTEMS - Basic features- Decimal NS – Binary N.S- Octal N.S. – Hexadecimal N. S. – Transformation between different numbering systems – direct transformation between binary and hexadecimal systems. ALGORITHMS AND FLOW CHARTS - Development of algorithms- How problems can be solved- examples - PROGRAMMING - Introduction to programming – Input output statements- Examples – Applications .

![](_page_43_Picture_0.jpeg)

# 1<sup>st</sup> year civil

CVE 101: Civil Drawing	Lecture	Tutorial	Lab	total
-	1	3	-	4

Irrigation Structure (earthen slopes – retaining walls – bridges – siphons – locks – culverts – weirs – spillways – aqueducts) – Steel Structures (steel sections – posts – beams – trusses – composite sections – bolted & welded splices) – computer applications.

CVE 102 : Theory of Structures 1	Lecture	Tutorial	Lab	total
	2	2	-	4

Introduction – reactions – statically determined beams – statically determined frames – statically determined trusses – influence lines – characteristics of flat spaces – computer applications.

CVE 111: Strength & Properties of	Lecture	Tutorial	Lab	total
Materials (1)	3	1	2	6

introduction – characteristics and testing for metals – construction stones & bricks – timber – lime – gypsium – cement – aggregates – polymers – testing machines – measurements equipment –Static tension test – Static compression test –Bending test- Applications of Egyptian Code in the flied of non-metallic materials.

CVE 112: Surveying (1)	Lecture	Tutorial	Lab	total
	3	2	1	6

Basic principles of surveying – advanced attitudes in surveying – linear measurements and their corrections- Compass surveying – Types of measurement instruments- International and local arrangement of maps- Reading of different maps and standard specifications – Traverses- Accurate areas computations- Blanimeter and its applications- Boundary and subdivisions of lands- Water surveying- Plate table surveying Leveling (theory, measurements, equipments)- Longitudinal and transverse sections- Network leveling-Contouring maps by using computer – Earthwork quantities –Theodalite and its applications

CVE 113: Computer Application (1)	Lecture	Tutorial	Lab	total
	2	-	2	6

Basics of computer programming – flow diagrams – algorithms – advanced basic language – matrices – functions & subroutines – FORTRAN language

![](_page_44_Picture_0.jpeg)

Menoufia University Civil Engineering Department

Undergraduate Program

BES 114: Mathematics (2)	Lecture	Tutorial	Lab	total
	4	2	-	6

I-ALGEBRA: Theory of complex numbers and its applications - The equations roots at third and fourth degree - Theory of matrices and its applications in linear equations system-Conical sections

II-CALCULUS: Differentiation: Advanced methods of integration – Properties and applications of definite integrals - Linear integration- Taylor 's expansion- Multi-integrals and its applications.

III-APPLIED MATHEMATICS: Fundamentals of elastic bodies mechanics (displacement, energy and stability)- Thermal stresses – Distribution of stresses and Hook's law- Theory of bending and Clabiron equation for equilibrium. Hydrostatic: Equilibrium of floating bodies-Bernoulli's equation- forces paths and equal domain surfaces.

CVE 122: Engineering Geology	Lecture	Tutorial	Lab	total
	2	2	-	4

Earth and its formation – rocks – rock types – geologic formations – geologic and geotechnical maps – geological engineering – geological faults – geological areas.

MPE 129: Mechanical Engineering	Lecture	Tutorial	Lab	total
	2	1	-	3

The definition of machines and their elements- energy conversion –prime moves (Gasoline and Diesel engines) – Simple steam plants- Refrigerators – Truck cranes – Winches- Road machinery the pedal power- Friction – Transmission pf power- Lubrication of machines.

ELE127: Electrical Engineering	Lecture	Tutorial	Lab	total
	2	1	-	3

Basic laws of electrical engineering – Main definitions- Kirchoff" s laws- Loop current method and node voltage method- Network theorems: Super position –Thevenins- Nortons-Reciprocity- Compensation and maximum power theorem- A-C circuits: Generation of A-C current- Frequency-Cycle- Angular frequency -Average and effective values- A-C current in R-L-C circuits

ARC 129 : Building Construction	Lecture	Tutorial	Lab	total
	1	5	-	6

Building construction materials- Evaluation of building construction methods –Foundations-Brick building-Working stresses- Stone building- Bearing and retaining walls- Arches-Lintels- mortar, plain concrete and reinforced concrete- Isolation materials and their applications- Stairs- Prefabricated buildings.

![](_page_45_Picture_0.jpeg)

# 2<sup>nd</sup> year civil

CVE 201: Theory of Structures 2	Lecture	Tutorial	Lab	total
	2	2	-	4

-Stress analysis – structural deflection – analysis of statistically undetermined structures - three moment distribution theory – fixed points theory – moving loads – deflection of polygonal columns.

CVE 202: Reinforced Concrete	Lecture	Tutorial	Lab	total
Structures (1)	2	2	-	4

Introduction – design methods using allowable stress – design of sections subject to bending moments – loads – design of sections subject to shear stress – design of reinforced concrete beams – design of columns – design of slabs – design of frames.

CVE 213: Soil Mechanics	Lecture	Tutorial	Lab	total
	4	1	1	6

Introduction – basic properties and volumetric relations – soil classifications – soil moisture content – pressures in soil – stream lines and infiltration theory – shear stress and resistance – introduction to consolidation and strengthening.

BES 214: Mathematics (3)	Lecture	Tutorial	Lab	total
	4	2	-	6

Ordinary differential equations of the first order and fist degree and some applications – Ordinary differential linear equations of n th order and its applications – Double and triple integration's and their application – Spherical triangular computations – Matrices – Theory of finite difference equations and its applications

CVE 214: Computer Applications (2)	Lecture	Tutorial	Lab	total
	2	-	2	4

Introduction – applications in the field of materials – applications in the field of surveying – applications in the field of theory of structures

CVE 215 : Hydraulics 1	Lecture	Tutorial	Lab	total
	3	2	1	6

-Units & dimensions – fluids characteristics – fluid hydraustatics and pressure measurements – hydraustatic pressures on surfaces – stability of floating and submerged bodies – floating bodies subject to acceleration – fluid dynamics – piping systems – computer applications.

![](_page_46_Picture_0.jpeg)

#### Civil Engineering Department

#### Undergraduate Program

CVE 221 : Topographic Surveying	Lecture	Tutorial	Lab	total
	4	2	2	8

Modern Theodolite – measurement of horizontal angles – traverses – tacheometry surveying – horizontal and vertical curves – aerial surveying (photogrametry) – errors theory and contral of cadastral surveying.

CVE 222: Strength & Properties of	Lecture	Tutorial	Lab	total
Materials (2)	4	2	2	8

Concrete – concrete mix – concrete manufacturing – special concrete – fresh concrete – design of concrete mixture – hardened concrete – non-destructive concrete tests – quality assurance and quality control – behavior of material (hardness – shear – impact – fatigue) – non-destructive tests for metals – stress analysis (lab).

CVE 223: Irrigation and Drainage	Lecture	Tutorial	Lab	total
	4	2	-	6

- Networks of irrigation channels – losses in open channels networks – synoptic diagrams drawing for irrigation channels and drains – lining of channels – importance of drainage for different purposes – open drains – tile drainages – drainage (runoff) coefficient.

![](_page_47_Picture_0.jpeg)

# <u>3<sup>rd</sup> year civil</u>

CVE 301: Theory of Structures (3)	Lecture	Tutorial	Lab	total
	2	2	-	4

Deflection in statistically determined structures – forces method – center of elasticity and column analogy method – rate of deflection method – moment distribution method – approximate method to analyze statically undetermined structures – graphical method to calculate deflection of trusses – study of influence lines

CVE 302: Reinforced Concrete	Lecture	Tutorial	Lab	total
Structures (2)	2	2	-	4

- Different types of loads and loading – slabs and beams – statically determined frames – statically undetermined frames – curved surfaces – Varandeels – trusses – saw tooth structures – structure to cover large areas – miscellaneous topics – computer application.

CVE 313: Steel Structures (1)	Lecture	Tutorial	Lab	total
	4	3	1	7

- Introduction – connections – members subject to tension – members subject to compression

- beams - members subject to axial forces (beams and columns) - computer applications.

CVE 314: Hydraulics 2	Lecture	Tutorial	Lab	total
	4	1	1	6

Basic principles for fluid flow – similarities and standard analysis – principles of energies in open channels – principles of momentum in open channels – flow resistance in open channels – non-steady (variable) flows – computer applications.

CVE 315: Transportation and Traffic	Lecture	Tutorial	Lab	total
Engineering	4	2	1	7

-History of transportation system – basic requirements for traffic systems – transportation models – public transportation – economics of transportation – evaluation – vehicles – speed – traffic volumes – traffic ensities – traffic characteristics / behavior on highways – intersections at one or multiple levels – intersecton capacity – computer applications.

CVE 316: Legislations and Contracts	Lecture	Tutorial	Lab	total
	2	-	-	2

Planning for construction projects - policy for contracting for various construction projects - construction contracts in Egyptian legislation - Technical Specifications – quantities surveying

![](_page_48_Picture_0.jpeg)

Civil Engineering Department

Undergraduate Program

CVE 321: Design of Irrigation Works	Lecture	Tutorial	Lab	total
	2	2	-	4

-Design of different types of bridges – design of culverts – design of siphons – design of aqueducts – design of weirs

CVE 322: Soil Mechanics &	Lecture	Tutorial	Lab	total
Foundations	4	1	1	6

-Consolidation & consolidation coefficient – stiffness coefficient – effect of sample shape – sitfness theory – stress distribution – settlement – soil bearing capacity – mohr's theory and circles. shear strength in situ measurement – active and passive pressures and coefficients – slope stability – excavation and shuttering.

CVE 323: Geodesy	Lecture	Tutorial	Lab	total
	2	2	-	4

- Form of Earth – triangular networks – sight distances and towers heights – durability requirements for triangular networks – control of triangular networks – control of shapes with centers – control of networks with measured polygons – geodesic leveling – earth photogrammetric surveying – astronomical surveying – distances measurements electronically

CVE 324A: Properties & Testing of	Lecture	Tutorial	Lab	total
Materials	3	1	-	4

-Causes of structural failures – types of damages in concrete structures – types of damages in masonary buildings – repair materials – different construction methods.

CVE 324 A : Railway Engineering (1)	Lecture	Tutorial	Lab	total
CVE 325 A : Railway Engineering (2)	3	1	-	4

- Railway engineering – planning – routes of railways – crossings and transfer – passengers' traffic and stations – planning of stations / platforms for passengers – signals – branching – classification and Marshall signals – other signals – maintenance and adjustment of railway.

CVE 325 B: Water Resources	Lecture	Tutorial	Lab	total
	3	1	-	4

-Introduction to hydrology – definition of water basins – methods to estimate quantities of surface water – assessment of groundwater discharge – mathematical applications.

![](_page_49_Picture_0.jpeg)

# 4<sup>th</sup> year civil

CVE 411: Reinforced Concrete	Lecture	Tutorial	Lab	total
Structures (3)	4	2	-	6

Introduction to concrete sections for water structures – design of sections – rectangular tanks
 – double wall tanks – tanks with support – tanks resting on soil – underground tanks – elevated water tanks – tanks with different shapes - circular tanks – design using graphs and tables – bridges – prestressed concrete – silos – wind and earthquakes effects on structures – dynamic loads – theory of influence line and cracks – computer applications

CVE 412: Foundations Engineering	Lecture	Tutorial	Lab	total
0 0	4	2	-	6
Types of foundations - shallow foundations - foundation settlements - design of				

Types of foundations – shallow foundations – foundation settlements – design of foundation columns – types and design of raft foundations – retaining walls – piles foundations – bearing capacity of piles – wells and caisons.

CVE 413: Sanitary and Environmental	Lecture	Tutorial	Lab	total
Engineering	4	1	1	6

-Potable water characteristics – raw water collection – chemical precipiatio – filtration – water disinfection – design of water distribution network – types of pipes – sewerage system design – wastewater treatment (primary and secondary treatment) – waste disinfection and disposal – sludge management – computer application.

CVE 406: B.SC Graduation Project	Lecture	Tutorial	Lab	total
	-	4	-	4

Graduation Projects in the following fields: Materials, Soil Mechanics & Foundations, Theory of Structure, Highways Engineering, Concrete Structures, Steel Structures, Surveying, Sanitary & Environmental Eng., Irrigation & Drainage, etc

CVE 414A: Geotechnical and	Lecture	Tutorial	Lab	total
Foundation Engineering (2)	3	1	-	4

-Preliminary studies – site exploration and methods of borehole execution – geotechnical methods – ways of getting samples and their shape – field tests – site management – drawing soil log profile – site tools – boreholes distribution – field projects – geotechnical report.

![](_page_50_Picture_0.jpeg)

Civil Engineering Department

#### Undergraduate Program

CVE 414B: Design and construction of	Lecture	Tutorial	Lab	total
ports and Marine	3	1	-	4

Shape and configuration of ports – factors affecting ports organization – winds and waves – planning and construction of ports – resistance to water currents – ports facilities & buildings.

CVE 415A: Steel Structures (3)	Lecture	Tutorial	Lab	total
	3	1	-	4

- Composite Steel/Concrete Structures – introduction to buckling – design of rigid members using surface stress method – details.

CVE 415B: Advanced Geodesic	Lecture	Tutorial	Lab	total
Engineering	3	1	-	4

Adjusting engineering networks using accurate methods – astronomical surveys – identifying longtitudes and latitudes – using error theory to adjust networks – triangular traverses – accurate leveling.

CVE 421: Highways & Airports	Lecture	Tutorial	Lab	total
Engineering	3	2	1	6

Highway design and control – design elements in longitudinal directions – design elements of cross sections – crossings in same level and at different levels – subgrade material – pavement material – design of flexible pavement – design of rigid pavement – computer applications.

CVE 422: Irrigation and structures	Lecture	Tutorial	Lab	total
Design	2	2	-	4

Design of foundation for water control structure – Regulators – Irrigation Structures (Locks) – Basics for water storage structures (Reservoirs & Dams).

CVE 423: Steel Structures 2	Lecture	Tutorial	Lab	total
	4	2	-	6

 Introduction – planning for steel bridges – design of floors – design of main girders of bridge – stiffening – connections in steel bridges – pillars for steel bridges – steel truss bridges – computer applications.

![](_page_51_Picture_0.jpeg)

Civil Engineering Department

Undergraduate Program

CVE 426: Feasibility Studies and	Lecture	Tutorial	Lab	total
Project Management	2	-	-	2

Planning and scheduling, Construction economics, contract construction, construction safety and health – Relation between cost and time.

CVE 424A: Reinforced Concrete	Lecture	Tutorial	Lab	total
Structures (4)	2	2	2	6

- History of reinforced shell structures – shells walls and domes – cylindrical shell surfaces – flat folded surfaces.

CVE 424B: Transportation & Highway	Lecture	Tutorial	Lab	total
Engineering	2	2	2	6

Soil stabilization for bituminous pavement – testing for road construction materials – roads maintenance – airport engineering

CVE 425A: Theory of Structures (4)	Lecture	Tutorial	Lab	total
, , , , ,	3	1	-	4

Introduction to theory of elasticity – differential equations for plates – boundary conditions for bending theory – advanced solution for differential equations using dual series & Fourier single series – differential equations for cylindrical sheets – numerical and approx. methods .

CVE 425B: Environmental Engineering	Lecture	Tutorial	Lab	total
	3	1	-	4

Surface and groundwater treatment – advanced application in activated sludge system – self purification of streams – sludge thickening and anaerobic digestion – solid waste management – sanitary landfill – selected topics.

![](_page_52_Picture_0.jpeg)

# 11- Programme admission requirements

Receiving the student clearing the final year of secondary school as controlled by the supreme council of universities' admission office. Students are admitted to the programme specializations according to the internal regulations stating the minimum total marks for each programme. This minimum number is controlled only by the demand of students to join the various disciplines while maintaining approxmate equal student number in each programme.

#### <u>12- Regulations for progression and programme completion</u>

### Second Year / First Semester

Students are admitted to the programme according to the internal regulations stating the minimum total marks for each programme. This minimum number is controlled only by the demand of students to join the various disciplines while maintaining approximate equal student number in each programme.

#### Second Year / First Semester Onwards

Students have to complete all courses in each programme year successfully in order to progress for the subsequent year. A student might fail in not more than two courses and still progresses to the subsequent year. However, in such a case, his/her total marks and grade is not calculated until the failed courses are cleared successfully.

The student gets a pass grade when he passes the examination successfully. In case the student has acceptable excuse for absence in a course, he gets the actual grade. The grades of the successful student in a course and in the general grade are evaluated as follows:

Excellent	from	85%	to less than	100%				
Very Good	from	75%	to less than	85%				
Good	from	65%	to less than	75%				
Pass	from	50%	to less than	65%				
• The course in which the student fails its examination is evaluated by one of the following grades:								
Poor	Points from	30%	to less than	50%				
Very Poor			less than	30%				

![](_page_53_Picture_0.jpeg)

The B.Sc. general grade for students is based on the cumulative marks obtained during all the years of study. The students are then arranged serially according to their cumulative sum. The student is awarded an honor degree if his cumulative sum is distinction or very good provided that he gets a gentral grade not less than very good in any class of study other than the preparatory year. Moreover, he should have not failed in any examination he did in any class other than the preparatory year.

Evaluator Tools		Examples		
Final year students	Questionnaire	<ul> <li>A well selected 4<sup>th</sup> year civil students with grade higher than good.</li> </ul>		
Graduates	Questionnaire	<ul> <li>Close contact with the graduates in construction sites and consultation services by the staff members.</li> </ul>		
Stakeholders	Questionnaire	<ul> <li>Governmental authorities and construction companies in the region (e.g. Arab contractors company, CEMEX, Bridge and Roadway administration, etc.)</li> </ul>		
External Evaluators	Evaluation reports	<ul> <li>تقرير أولى للمراجعة من خلال اللجان العلمية بالقسم في التخصصات المختلفة (الأستاذ الدكتور/ حازم صالح الدكتور/ ابر اهيم حسن هاشم)</li> <li>تقرير مراجعة للأستاذ الدكتور/ عماد السيد أحمد عتمان</li> <li>كمر اجع خارجى- كلية الهندسة – جامعة طنطا)</li> </ul>		
Others • Student's scientific conference. • Seminars.		<ul> <li>Meeting department head &amp; faculty Dean each year for constructive discussions</li> <li>لقاءات وسيمينار ات وإجتماعات مع مسؤلين تنفيذيين</li> </ul>		

# 13- Evaluation of programme intended learning outcomes

Coordinator of Program Quality assurance committee	Signature	Head of Civil Dept. Council	Signature
		Prof. Mahmoud A. Elsheikh	