



Ministry of higher education
High valley institute for engineering and technology
Civil Engineering department



Civil Engineering Program Specification

Academic year: 2022-2023



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Program Specification **For the academic year 2022/2023**

A. General

1. Basic Information

Faculty / Institute:	Higher Valley Institute of Engineering and Technology in Obour – Qalyubia
Department:	Civil Engineering
Program Title:	Civil Engineering
Nature of the program:	Mono
Scientific Department responsible for the program:	Civil Engineering Department
Head of Department:	Dr. Ashraf Abdel Khalek Mostafa
Program Coordinator:	Dr. Ashraf Abdel Khalek Mostafa
External evaluator:	Dr Hanan Eltobgy
Date of external evaluation:	September/ 2022
Date of program Operation:	2009- 2010 (2385) لسنة (2008) واللائحة الصادرة بالقرار رقم
Date of the Department council approval	Department council's board meeting on 4-12-2021 Upgrade on 6-5-2023

2. Staff Members

Civil Engineering Program is taught by 22 highly qualified staff members, 4 of them are full-time employed and 13 are part-time staff in addition to 5 employed staff members for teaching the basic science and civil subjects. (**Appendix 2**)

B. Professional Information

1. Introduction

Civil Engineering is a branch of engineering that is based on various civil designs and applications of construction fitted with various accomplished general basic sciences, applied research and economic fundamentals. This branch is responsible for teaching the student how to design and supervision engineering disciplines. The discipline of Civil engineering is based on the following:

- Gaining professionally in design and supervision of civil engineering disciplines
- Management construction site
- Appropriate Selection for building materials from the perspective of strength, durability, suitability of use to location, temperature, weather conditions and impacts of seawater and environment.
- Using the codes of practice of all civil engineering disciplines effectively and professionally
- Leading and supervision to a group of designers and site or lab technicians.
- Gaining knowledge and technique skills from human and physical sciences, engineering tools and practice.



The program aims to provide the student with areas of knowledge and skills that suit the needs of the labour market and cope with the accelerated technological progress in light of the Fourth Industrial Revolution. Also, it seeks to develop the student skills for self- learning to be able to achieve progress lonely or with others; .so he has to be trained to take responsibility in form of producing researches or reports to know how to obtain, analyse and classify new data, also he has to be trained to involve through the global issues and solve problems related to the society within projects. So, the program of Civil and Design focuses on increasing students' ability to receive information, think critically, solve problems, attend field trainings so that they are able to keep pace with the rapid development, the needs and systems of the labour market.

The current program fulfills the NARS2018 requirements of civil Engineering

2. Program Mission

- Preparing engineers specialized in the field of contemporary civil engineering applications.
- Preparing a generation capable of dealing with the needs, techniques, and systems of the labour market in line with the needs of the age and the requirements of all categories of society.
- Developing the concept of distinguished scientific research and linking it to serving the local and regional community

The mission of the program contributes the mission of the High valley institute for engineering and Technology as shown in appendix (3)

3. General and Executive Objectives of The Program:

The civil engineering program aims to provide graduates with high quality education and to prepare them for a successful professional career by:

a. Keeping pace with the labor market within the framework of sustainable development 2030.

- O1- Being creativity and imagine in the design process.
- O2- Apply strategies to solve societal problems.
- O3- Maintain the built environment with its social, economic and environmental aspects to achieve the 2030 sustainable development goals.

b. The ability And Introduce The professional and scientific advisory services to serve the community in the field of civil engineering.

- O4- Implementing projects that adopt a solution to a contemporary societal problem that depends on various civil designs and construction applications and keeping pace with Cods and legislation.
- O5- Conduct professional research that solves civil problems.

c. Mastering the tools of competition in the labor market and keeping pace with rapid technological progress.

- O6- Professional development based on self-learning and continuous learning.
- O7- Developing skills in employing modern computer programs in the analysis, design and modeling process.
- O8- Gain experience in effective communication with the surrounding community.
- O9- Qualification to deal with the latest materials and systems that can transform engineering drawings into a real condition that meets the needs of the client and the era.

d- Qualification to communicate with the scientific research system and integrate with societal and environmental problems to work on solving them.

- O10- Analysis and deduction through simulation systems.



O11- Conducting scientific research.

4. Distinctive Features of The Program:

- The program is based on the credit hour system, which gives the student the opportunity to enroll in a number of appropriate courses each semester.
- The program provides an ideal and distinct environment for education and provides it with mechanisms that exceed the outputs of the program.
- The program allows the student to train on advanced work in line with work requirements in all institutions.
- The geographical location of the institute, through its presence in the Orabi Association in Obour City, allows easy movement to and from several governorates neighboring Cairo, as well as ease of communication and community participation with many industrial establishments located in the industrial zone in Obour City.
- The program allows the student to interact with the international labor market by participating in international competitions.
- The educational program provides scientific content that keeps pace with the global goals of sustainable development.

5. Job Opportunities

- Consultancy Bureau (Design, planning, technical office).
- Research centers (construction, planning, population studies, environmental studies, and construction building technology).
- Construction companies (construction and implementation).
- Economic and feasibility studies of projects.
- Quality and modernization entities.
- Real estate investment field.

6. The Attributes of The Program Alumni:

The Program adopted the attributes of the Engineers of NARS 2018 to be attributes of the program alumni.

To achieve the program mission and aims., Program graduates should be able to:-

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;
3. Behave professionally and adhere to engineering ethics and standards;
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles;
7. Use techniques, skills, and modern engineering tools necessary for engineering practice;



8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;
9. Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

The attributes of the program alumni contribute with both of the mission and the objectives of the program as shown in table (1), (2).

Table (1): The contribution between the attribute of the program alumni and the objectives of the program

Executive Objectives of the Program	The attribute of the program alumni
O1- Being creativity and imagine in the design process.	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
O2- Apply strategies to solve societal problems.	Apply analytic critical and systemic thinking to identify, diagnose, and solve engineering problems with a wide range of complexity and variation
O1- Being creativity and imagine in the design process.	Demonstrate leadership qualities, business administration and entrepreneurial skills.
	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community
O3- Maintain the built environment with its social, economic and environmental aspects to achieve the 2030 sustainable development goals.	Value the importance of the environment, both physical and natural, and work to promote sustainability principles
O4- Implementing projects that adopt a solution to a contemporary societal problem that depends on various civil designs and construction applications and keeping pace with Cods and legislation.	Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations
	Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community.
	Behave professionally and adhere to engineering ethics and standards.
O5- Conduct professional research that solves civil problems.	Behave professionally and adhere to engineering ethics and standards;
O6- Professional development based on self-learning and continuous learning.	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post-graduate and research studies
O7- Developing skills in employing modern computer programs in the analysis, design and modeling process.	Use techniques, skills and modern engineering tools necessary for engineering practice.
O8- Gain experience in effective communication with the surrounding community.	Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance
	Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.



O9- Qualification to deal with the latest materials and systems that can transform engineering drawings into a real condition that meets the needs of the client and the era.	Use techniques, skills and modern engineering tools necessary for engineering practice;
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Follow Table (1): The contribution between the attribute of the program alumni and the objectives of the program

Executive Objectives of the Program	The attribute of the program alumni
O10- Analysis and deduction through simulation systems.	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation
O11- Conducting scientific research.	Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation
	Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post-graduate and research studies

Table (2): the compatibility of the attributes of the program alumni with the program mission

Program Mission	The attribute of the program's alumni
Preparing engineers specialized in the field of contemporary civil engineering applications.	Communicate effectively using various methods, tools and languages with different categories to deal with academic/professional challenges in a critical and creative way.
	Apply critical and systemic analytical thinking to identify, diagnose and solve complex and different engineering problems.
Preparing a generation capable of dealing with the needs, techniques and systems of the Labour market in line with the needs of the age and the requirements of all categories of society.	Communicate effectively using various methods, tools and languages with different categories to deal with academic/professional challenges in a critical and creative way.
	Apply critical and systemic analytical thinking to identify, diagnose and solve complex and different engineering problems.
	Take responsibility and lead a diverse team of different specialized professionals.
	Recognize its role in promoting the engineering field and contributing to the development of the profession and society.
	Appreciate the importance of the environment, both physical and natural, and work to promote the principles of sustainability.
	Master a wide range of engineering knowledge and specialized skills and be able to apply the knowledge gained using theories and abstract thinking in real-life situations.
	Demonstrate leadership qualities, business management and entrepreneurial skills.
	Use modern engineering techniques, skills and tools necessary to practice engineering. Act professionally and adhere to professional ethics.
Developing the concept of distinguished scientific research and linking it to serving the local and regional community	Take full responsibility for self-learning and self-development, and participate in the Demonstrate leadership qualities, business management and entrepreneurial skills.
	Use modern engineering techniques, skills and tools necessary to practice engineering.
	Act professionally and adhere to professional ethics. Continuous learning and demonstration of the ability to participate in graduate and research



	studies. Matrix that matches the graduate's specifications with the mission of the program
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7- The Competencies of The Graduate

The Program adopted the competencies of the graduate of NARS 2018 for Engineering and Civil Engineer.

General competencies of the engineer of the institute (C):(Level A)

- C1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
- C2. Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
- C3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
- C4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
- C5. Practice research techniques and methods of investigation as an inherent part of learning.
- C6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.
- C7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.
- C8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
- C9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
- C10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.

Specialized competencies of the civil program (CR): (Level B)

- CR1. Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.
- CR2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.
- CR3. Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.
- CR4. Deal with biddings, contracts and financial issues including project insurance and guarantees.



Matrix (1): The contribution between the graduate competencies of the program and the competencies of the graduate of NARS 2018

Competencies of the program		Competencies of NARS 2018															
		General competencies										Specific competencies					
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4		
General Competencies of the engineer of the institute	C1	■															
	C2		■														
	C3			■													
	C4				■												
	C5					■											
	C6						■										
	C7							■									
	C8								■								
	C9									■							
	C10										■						
Competencies of the Civil Program	CR1											■					
	CR2												■				
	CR3													■			
	CR4															■	

The relation between the program objectives and the competence of the graduate is studied in table below.

Table (3): The relation between program objectives and the competence of graduate

The program objectives	The competence of the graduate
O1- Being creativity and imagine in the design process.	C3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
	C9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
	Cr1. Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.
O2- Apply strategies to solve societal problems.	C6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.
	C9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
O3- Maintain the built environment with its social, economic and	C1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.



environmental aspects to achieve the 2030 sustainable development goals.	Cr3. Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.
O4- Implementing projects that adopt a solution to a contemporary societal problem that depends on various civil designs and construction applications and keeping pace with Cods and legislation.	C1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
	C3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
	Cr1. Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.
	Cr2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.
O5- Conduct professional research that solves civil problems.	Cr4. Deal with biddings, contracts and financial issues including project insurance and guarantees.
O6- Professional development based on self-learning and continuous learning.	C5. Practice research techniques and methods of investigation as an inherent part of learning.
	C4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
	C10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.
	Cr4. Deal with biddings, contracts and financial issues including project insurance and guarantees.
O7- Developing skills in employing modern computer programs in the analysis, design and modeling process.	C4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
O8- Gain experience in effective communication with the surrounding community.	C7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.
	C8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
O9- Qualification to deal with the latest materials and systems that can transform engineering drawings into a real condition that meets the needs of the client and the era.	Cr3. Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.
	Cr4. Deal with biddings, contracts and financial issues including project insurance and guarantees.
O10- Analysis and deduction through simulation systems.	C2. Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
O11- Conducting scientific research.	C5. Practice research techniques and methods of investigation as an inherent part of learning.
	C8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.



8. The Learning Out-Comes of The Program (LOs):

The program has three domains for the learning out comes: Cognitive Domains, Psychomotor Domains, Affective Domains. And these learning out comes are related to the competencies of the graduate as shown in table (4):

a. Cognitive Domains (LOs):

- Lo1.** Identify, formulate basic science and mathematics.
- Lo2.** Simulate, analyze and interpret data.
- Lo3.** Assess and evaluate findings.
- Lo4.** Use statistical analyses and objective engineering judgment to draw conclusions.
- Lo5.** Display global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
- Lo6.** Define standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
- Lo7.** State the factors affecting the engineering projects.
- Lo8.** Select appropriate and sustainable technologies for the construction of buildings, infrastructures and water structures.
- Lo9.** Analysis structure mechanical-properties, and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.
- Lo10.** Display relevant topics for Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors
- Lo11.** address construction defects, instability and quality issues; maintain safety measures in construction and materials
- Lo12.** assess environmental impacts of projects.
- Lo13.** Classify the constraints of: project financing, project management, cost control and methods of project delivery
- Lo14.** Predict the knowledge of industries, organizations, regulations and procedures involved.
- Lo15.** Explain the role of industries, organizations, regulations and procedures involved

b. Psychomotor Domains (LOs)

- Lo16.** Solve complex engineering problems.
- Lo17.** Apply engineering fundamentals, basic science and mathematics.
- Lo18.** conduct and Develop appropriate experimentation.
- Lo19.** Apply engineering design processes to produce cost-effective solutions that meet specified needs.
- Lo20.** Use contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements.
- Lo21.** Conduct techniques and methods of investigation as researches and reports.
- Lo22.** Plan, supervise and monitor implementation of engineering projects.
- Lo23.** Use contemporary tools to implement engineering design drawings, and presentations.
- Lo24.** Use numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques
- Lo25.** Produce designs for Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures
- Lo26.** Plan and manage construction processes
- Lo27.** Transform design concepts into buildings



Lo28. integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery

c. Affective Domains (LOs):

Lo29. Work efficiently as an individual and share in team works.

Lo30. Communicate to convey ideas verbally, numerically, graphically, and using symbols effectively with a range of audiences.

Lo31. Use creative, innovative and flexible thinking.

Lo32. Acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

Lo33. Practice self-learning and other learning strategies.

Lo34. maintain safety in the implementation of the project

Table no (4): The relation between the competencies and the learning out comes of the program

N0	The competency	The learning out comes Los		
		Cognitive Domains	Psychomotor Domains	Affective Domains
C1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	1. Identify, formulate complex engineering problems	16.solve complex engineering problems. 17.apply engineering fundamentals, basic science and mathematics	
C2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	2.Simulate, analyze and interpret data. 3.Assess and evaluate findings. 4. Use statistical analyses and objective engineering judgment to draw conclusions.	18.Conduct and develop appropriate experimentation.	
C3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	5.Display global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	19.Apply engineering design processes to produce cost-effective solutions that meet specified needs.	
C4	Utilize contemporary technologies, codes of practice and standards, quality guidelines,health and safety requirements, environmental issues and risk management principles.	6.Define standards, quality guidelines, health and safety requirements, environmental issues and risk management principles. 12.Assess environmental impacts of projects.	20.Use contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements. 26.Plan and manage construction processes	30.Communicate to convey ideas verbally, numerically, graphically, and using symbols effectively with a range of audiences
C5	Practice research techniques and methods of investigation as an inherent part of learning.		21.Conduct techniques and methods of investigation as researches and reports.	33.Practice self-learning and other learning strategies.
C6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	7.State the factors affecting the engineering projects. 13. Classify the constraints of: project financing, project management, cost control and methods of project delivery	28.integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery	29.Work efficiently as an individual and share in team works. 34. Maintain safety in the implementation of the project
C7	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.			29. Work efficiently as an individual and share in team works.



Follow table no (4): The relation between the competencies and the learning out comes of the program

no	The competency	The learning out comes		
		Cognitive Domains	Psychomotor Domains	Affective Domains
30.	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.		20. Use contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements. 23. Use contemporary tools to implement engineering design drawings, and presentations.	30. Communicate to convey ideas verbally, numerically, graphically, and using symbols effectively with a range of audiences.
C9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.		26. Plan and manage construction processes	31. Use creative, innovative and flexible thinking. 32. acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
C10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	14. Predict the knowledge of industries, organizations, regulations and procedures involved. 15. Explain the role of industries, organizations, regulations and procedures involved	23. Use contemporary tools to implement engineering design drawings, and presentations.	33. Practice self-learning and other learning strategies.
CR1	Select appropriate and sustainable technologies for the construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	8. Select appropriate and sustainable technologies for the construction of buildings, infrastructures and water structures. 9. Analysis structure mechanical-properties, and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	24. Use numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques	
CR2	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.	10. Display relevant topics for Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors	19. Apply engineering design processes to produce cost-effective solutions that meet specified needs. 25. Produce designs for Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures.	
CR3	Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.	11. address construction defects, instability and quality issues; maintain safety measures in construction and materials 12. assess environmental impacts of projects.	22. Plan, supervise and monitor implementation of engineering projects. 26. Plan and manage construction processes	34. maintain safety in the implementation of the project
CR4	Deal with biddings, contracts, and financial issues including project insurance and guarantees.	13. Classify the constraints of: project financing, project management, cost control and methods of project delivery	27. Transform design concepts into buildings 28. integrate plans into overall planning within the constraints of: project financing, project management, cost control and methods of project delivery	



9. Duration of The Program:

The duration of study to obtain a bachelor's degree is five academic years, starting with a general preparatory school year for all students, and the specialization after that is according to the student's desire, inclinations, and readiness, and is determined by the capacity of the departments. The study begins and ends in each semester by a decision of the Supreme Council of Universities.

10. Program Structure

The student has to pass 174 credit hours to fulfill the program as 165 hrs. represent obligatory courses and 9 credit hours are for optional (elective) courses, as shown in table (5).

Table no. (5): identification of the credit hours of the program

Total hours / unit	174 hour/ unit
	165 hour / unit
	9 hour / unit
lecture	116 hours
tutorial	106 hours
lab	18 hours

The program is divided into (5) subject areas as shown in table (6)

Table no. (6): The subject area of the program

courses		Total hour		percentage	
Basic science courses		33		18.97 %	
Humanitarian – social science- general culture courses		17		9.77 %	
Specialization courses	General	74	115	42.53 %	66.09 %
	Specific	41		23.56 %	
English courses		6		3.45 %	
Field training courses		3		1.72 %	

11. Program Levels / Courses

Totally credit hour 174 hour divided as levels as follows:

- Level one: 34 unit
- Level two: 36 unit
- Level three: 38 unit
- Level four: 35 unit
- Level five: 31 unit



Table no. (7): The Program Study Plan (Suggested Schedule)

Details	Course Code	Course Name	prerequisite Course	Credit Hours	Contact Hours				Mid Exam	Class Work	Final Exam	
					Lecture	Tutorial	Lab	Total				
Level one	First term courses	PHYS 101	Mechanics ,sound ,heat	-	3	2	2	-	4	20	30	50
		PHYS 111	G.physics laboratory I	Concurrent PHYS 101	1	-	-	2	2	10	50	40
		CHEM 101	General Chemistry I	CHEM 111	3	2	2	-	4	20	30	50
		CHEM 111	Chemistry lab	Concurrent CHEM 101	1	-	-	2	2	10	50	40
		Math101	Calculus I	-	3	2	2	-	4	20	30	50
		ENGR 101	introduction to Engineering	-	1	1	-	-	1	20	30	50
		ENGR 102	Engineering drawing and project	-	2	1	2	-	3	20	30	50
		ENGR 103	Engineering Mechanics I (Static)	-	3	2	2	-	4	20	30	50
	Second term courses	PHYS 102	Electricity & magnetism	PHYS 101 & PHYS112	3	2	2	-	4	20	30	50
		PHYS112	G.physics laboratory II	PHYS 102	1	-	-	2	2	10	50	40
		Math102	Calculus II	Math101 or exam	3	2	2	-	4	20	30	50
		CECE 101	F.To computer program	-	3	2	-	2	4	20	30	50
		ENGR 105	Production Engineering	-	1	1	-	-	1	20	30	50
		ENGR 104	Engineering Mechanics II (Dynamics)	ENGR 103 Math 101	3	2	2	-	4	20	30	50
ENGL 101	Elementary English	-	3	2	2	-	4	20	30	50		
Level Two	First term courses	ARCH 205	Building construction I	-	3	2	2	-	4	15	25	60
		CVEE 203	FieldPlane&Topographic Surveying	Math102	3	2	2	-	4	15	25	60
		CVEE204	Field PlaneSurveying	Concurrent CVEE 203	1	-	2	-	2	10	40	50
		CVEE301	Structural analysis I	ENGR 103	3	2	2	-	4	15	25	60
		ENGR 203	Strength&TestingMaterials	ENGR 103	3	2	2	-	4	15	25	60
		ENGL 102	Lower intermediate English	ENGL 101	3	2	2	-	4	20	30	50
		Math 201	Calculus III	Math102	3	2	2	-	4	20	30	50
	Second term courses	CVEE 110	Civil drawing	ENGR 102	1	1	2	-	3	20	30	50
		CVEE201	Construction Material & Quality Control	ENGR 203 & CVEE202	3	2	2	-	4	15	25	60
		CVEE202	Construction Material Lab	Concurrent CVEE201	1	-	-	2	2	10	40	50
		CVEE 302	Structural analysis II	ENGR 203 & CVEE301	3	2	2	-	4	15	25	60
		ENGR 205	Earth Systems	-	3	2	2	-	4	15	25	60
		BASE 303	Engineering Economics	Math102	3	2	2	-	4	20	30	50
		Math 202	Differential Equations	Math 201	3	2	2	-	4	20	30	50



Follow table no. (7): The Program Study Plan (Suggested Schedule)

Details	Course Code	Course Name	prerequisite Course	Credit Hours	Contact Hours				Mid Exam	Class Work	Final Exam	
					Lecture	Tutorial	Lab	Total				
Level Three	First term courses	Math 301	probability & statistics	Math102	3	2	2	-	4	20	30	50
		ENGR 204	Fundamentals of fluid mechanics	-	3	2	2	-	4	15	25	60
		CVEE303	Geotechnical Engineering Structures	ENGR 205	3	2	2	-	4	15	25	60
		CVEE304	Geotechnical Engineering Lab	Concurrent CVEE303	1	-	-	2	2	10	40	50
		CVEE306	RC Concrete Design I	-	3	2	2	-	4	20	30	50
		CVEE328	Structural analysis III	CVEE 302	3	2	2	-	4	15	25	60
		CVEE338	Engineering survey	CVEE 203	3	-	-	2	2	15	25	60
	Second term courses	Math 302	Linear Algebra and Matrices	Math 202	3	2	2	-	4	20	30	50
		BASE 306	Research Methods	-	3	2	2	-	4	20	30	50
		ENGR 302	Mechanical &Electrical Engineering	Math 201 & PHYS 101	3	2	2	-	4	15	25	60
		CVEE 211	Civil drawing II	CVEE 110	1	1	-	2	3	20	30	50
		CVEE312	RC Concrete Design II	CVEE306	3	2	2	-	4	20	30	50
		CVEE307	Fundamentals of Hydraulic Engineering	ENGR 204	3	2	2	-	4	15	25	60
		CVEE 310	Geotechnical Engineering Design	CVEE303	3	2	2	-	4	20	40	40
Level Four	First term courses	BASE 401	Communication skills	-	3	3	-	-	3	20	30	50
		CVEE101	Environmental Science & Technology	-	2	1	2	-	3	15	25	60
		CVEE305	Steel Str.Design	CVEE 302	3	2	2	-	4	20	40	40
		CVEE401	Advanced Foundations Engineering	CVEE 310	3	2	2	-	4	15	25	60
		CVEE405	Design RC Concrete III	CVEE312	3	2	2	-	4	20	30	50
		CVEE412	Design of Irrigation systems	CVEE307	3	2	2	-	4	20	30	50
	Second term courses	BASE 404	negotiation skills	-	3	3	-	-	3	20	30	50
		CVEE205	Transportation & traffic Engineering	CVEE201	3	2	2	-	4	15	25	60
		CVEE 308	environmental & Sanitary engineering	CVEE307	3	2	2	-	4	15	25	60
		CVEE324	Construction Materials& quality control	CVEE201	3	2	2	-	4	15	25	60
		CVEE404	Computer Methods in str.Analysis& design	CVEE301	3	2	-	2	4	20	30	50
		CVEE415	Design RC Concrete IV	CVEE405	3	2	2	-	4	20	30	50



Follow table no. (7): The Program Study Plan (Suggested Schedule)

Details Levels	Course Code	Course Name	prerequisite Course	Credit Hours	Contact Hours				Mid Exam	Class Work	Final Exam	
					Lecture	Tutorial	Lab	Total				
Level Five	First term courses	BASE 307	Contracts, Bids & Liabilities	-	2	2	-	-	2	20	30	50
		BASE402	Feasibility studies	CVEE306	3	2	2	-	4	20	30	50
		CVEE206	Civil Engineering & project analysis	-	3	2	2	-	4	15	25	60
		CVEE311	High Way Design	CVEE205	3	2	2	-	4	20	30	50
		CVEE330	Advanced Steel Str. Analysis	CVEE305	3	2	2	-	4	20	30	50
		CVEE402	Methods& Equipment For Engineering	CVEE306	2	1	2	-	3	15	25	60
		CVEE490	senior Project I	-	1	1	3	-	4	20	40	40
	Second term courses	BASE 308	Seminar	-	0	2	-	-	2	20	30	50
		BASE309	human rights	-	0	1	-	-	1	20	30	50
		CVEE336	Railway Engineering	-	3	2	2	-	4	15		60
		CVEE339	professional Training in civil engineering	-	3	-	-	-	0	30	30	40
		CVEE422	Earthquake Engineering	CVEE330 & CVEE328	3	2	2	-	4	15	25	60
		CVEE489	Selected topics	-	3	2	2	-	4	15	25	60
		CVEE491	senior Project II	CVEE490	2	1	3	-	4	20	40	40
					174	114	106	18	238			

Note:

The Program Board on September 27, 2021, And the Academic Council on October 2, 2021, approved the recommendation submitted by the Promotion and Development Committee regarding the action plan to improve the following:

- The actual hours of the practical courses match the credit hours as missioned in the reference standard of The Ministry of Higher Education 2020.



12. the contribution between the courses and the competences of the alumni

Each course of the program contributes from (1) to (5) of the competencies of the graduate according to the nature of the course, as shown in matrix (2).

Matrix no. (2): The contribution between the Competences of the graduate and the courses of the program

Details levels		N0	Code	Course	Credit hrs.	Contact hrs. ²	Competences of the graduate																No of C		
							GENERAL										SPECIFIC								
							C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	CR1	CR2	CR3	CR4					
Level one	First term courses	1	PHYS101	Classical mechanical, sound, heat	3	5	1				1						1							3	
		2	PHYS111	General physics laboratory 1	1	2				1						1	1								3
		3	CHEM 101	General chemistry 1 for engineers	3	5	1				1						1								3
		4	CHEM 111	General chemistry lab	1	2	1	1		1	1			1											0
		5	MATH 101	Calculus 1	3	5	1				1				1										3
		6	ENGR 101	Introduction to engineering	1	1	1				1						1								3
		7	ENGR 102	Engineering Drawing and projection	2	3	1	1						1	1										5
		8	ENGR 103	Engineering mechanics 1	3	5	1	1																	2
	Second term courses	9	CECE 101	Fundamental to computer programming	3	5	1			1				1	1										5
		10	MATH 102	Calculus 2	3	5	1				1			1											3
		11	PHYS102	Electricity and magnetism	3	5	1	1			1						1								5
		12	PHYS112	General physics laboratory 2	1	2	1	1		1							1								5
		13	ENGL 101	Elementary English	3	5	1				1			1	1	1	1								6
		14	ENGR 104	Engineering mechanics 2	3	5	1	1			1														3
		15	ENGR 105	Production engineering	1	1	1			1		1	1												5



Follow matrix no. (2): The contribution between the Competences of the graduate and the courses of the program

Details levels		Matrix no (2) the contribution between the Competences of the graduate and the courses of the program/ the action plan																				
		N0	Code	Course	Credit hrs.	Contact hrs. ²	Competences of the graduate														No of C	
							GENERAL										SPECIFIC					
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	CR1	CR2	CR3	CR4									
Level Two	First term courses	16	ARCH205	Building Construction	3	E						1	1						1	3		
		17	CVEE203	Field plane & Topographic Surveying	3	E	1	1					1	1				1			0	
		18	CVEE204	Field plane Surveying	1	Y	1	1					1	1				1			0	
		19	CVEE301	Structural Analysis 1	3	E										1	1				1	3
		20	ENGR 203	Strength and testing of materials	3	E	1	1			1							1				E
		21	ENGL 102	Lower intermediate English	3	E							1	1	1							3
		22	MATH 201	Calculus 3	3	E	1	1								1						3
	Second term courses	23	CVEE110	Civil Drawing	1	Y								1	1	1					3	
		24	CVEE201	Construction Materials & Quality Control	3	E				1			1							1		3
		25	CVEE202	Construction Materials Lab	1	Y		1		1			1					1				E
		26	CVEE302	Structural Analysis 2	3	E										1	1				1	3
		27	ENGR 205	Engineering Geology (Earth Systems)	3	E	1				1							1				3
		28	BASE303	Engineering economics	3	E		1	1			1										3
		29	MATH 202	Differential Equations	3	E	1	1								1						3



Follow matrix no. (2): The contribution between the Competences of the graduate and the courses of the program

Matrix no (2) the contribution between the Competences of the graduate and the courses of the program/ the action plan																					
Details levels	N0	Code	Course	Credit hrs.	Contact hrs.	Competences of the graduate														No of C	
						GENERAL										SPECIFIC					
						C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	CR1	CR2	CR3	CR4		
Level Three	First term courses	٢٠	MATH 301	Probability and statistics	٣	±	✓	✓									✓			٣	
		٢١	ENGR 204	Fundamental of Fluid Mechanics	٣	±	✓	✓			✓							✓			±
		٢٢	CVVEE303	Geotechnical Engineering Structures	٣	±				✓								✓		✓	٣
		٢٣	CVVEE304	Geotechnical Engineering Lab	١	٢				✓								✓		✓	٣
		٢٤	CVVEE306	Reinforced Concrete Structural Design 1	٣	±			✓				✓					✓			٣
		٢٥	CVVEE328	Structural Analysis 3	٣	±			✓							✓		✓	✓		±
		٢٦	CVVEE338	Engineering Surveying	٣	±							✓	✓				✓			٣
	Second term courses	٢٧	MATH 302	Linear Algebra and Matrices	٣	±	✓	✓								✓					٣
		٢٨	BASE306	Research methods	٣	±					✓			✓	✓						٣
		٢٩	ENGR 302	General Mechanical & Electric Engineering	٣	±	✓	✓			✓										٣
		٤٠	CVVEE312	Reinforced Concrete Structural Design 2	٣	±			✓				✓					✓			٣
		٤١	CVVEE211	Civil Drawing 2	١	٢								✓	✓	✓					٣
		٤٢	CVVEE307	Fundamentals of Hydraulic Engineering	٣	±			✓								✓	✓			٣
		٤٣	CVVEE310	Geotechnical Engineering Design	٣	±			✓				✓					✓			٣



Follow matrix no. (2): The contribution between the Competences of the graduate and the courses of the program

Details levels		N0	Code	Course	Credit hrs.	Contact hrs. ₇	Competences of the graduate																No of C
							GENERAL										SPECIFIC						
							C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	CR1	CR2	CR3	CR4			
Level Four	First term courses	٤٤	BASE401	Communication skills	٣	٣							١	١	١						٣		
		٤٥	CVVE101	Environmental science & Technology	٣	٣	١			١										١		٣	
		٤٦	CVVE305	Steel Structural Design	٣	٤			١									١	١				٣
		٤٧	CVVE401	Advanced Foundation Engineering	٣	٤							١					١	١				٣
		٤٨	CVVE405	Reinforced Concrete Structural Design 3	٣	٤			١				١						١				٣
		٤٩	CVVE412	Design of Irrigation System	٣	٤			١				١						١				٣
	Second term courses	٥٠	BASE404	Negotiation skills	٣	٣		١					١	١	١								٤
		٥١	CVVE205	Transportation & Traffic Engineering	٣	٤				١		١							١				٣
		٥٢	CVVE308	Environmental & Sanitary Engineering	٣	٤				١									١	١			٣
		٥٣	CVVE324	Construction Materials & Quality Control 2	٣	٤				١		١									١		٣
		٥٤	CVVE404	Computer Methods in Str. Analysis & Design	٣	٤						١							١	١			٣
٥٥	CVVE415	Reinforced Concrete Structural Design 4	٣	٤			١				١							١			٣		



Follow matrix no. (2): The contribution between the Competences of the graduate and the courses of the program

Matrix no (2) the contribution between the Competences of the graduate and the courses of the program/ the action plan																						
Details levels	NO	Code	Course	Credit hrs.	Contract hrs.	Competences of the graduate												No of C				
						GENERAL										SPECIFIC						
						C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	CR1	CR2		CR3	CR4		
Level Five	First term courses	26	BASE307	Contracts, Bids& Liabilities	3	3			1						1					1		
		27	BASE402	Feasibility studies	3	3	1	1	1		1				1						0	
		28	CVVEE206	Civil Engineering cost Analysis & Project	3	3		1	1											1	1	
		29	CVVEE311	Highway Design	3	3			1							1	1				2	
		30	CVVEE330	Advanced steel Structural Analysis	3	3						1			1		1				2	
		31	CVVEE402	Methods& Equipment for Construction1	3	3				1		1							1		2	
		32	CVVEE490	Senior project 1	3	3			1				1	1	1					1	0	
	Second term courses	33	BASE308	Seminar	0	3				1		1	1		1						1	
		34	BASE309	Human Rights	0	3	1			1		1			1						1	
		35	CVVEE336	Railway Engineering	3	3						1					1		1		2	
		36	CVVEE339	Professional Training in civil Engineering	3	0					1	1								1		2
		37	CVVEE422	Earthquake Engineering	3	3					1		1				1				2	
		38	CVVEE489	Selected topics in Civil Engineering	3	3					1	1			1				1	1	0	
		39	CVVEE491	Senior project 2	3	3			1					1	1	1					1	0
Sum of the courses serving the competences				192	210	17	10	17	5	16	5	10	6	17	5	10	10	11	0			
%of the courses serving the competency to the total courses						8.1%	4.8%	8.1%	2.4%	7.6%	2.4%	4.8%	8.1%	2.4%	4.8%	4.8%	4.8%	4.8%	0%			

13. Teaching and Learning Methods Included in The Program:

- On line / face to face lectures
- Tutorials: sheets/ sketches
- Projects
- Problem solving
- Brain storming
- Practical: lab
- Discovering
- Site visit
- Reports/ researches
- Cooperative work
- Presentation
- Discussion
- Modeling

All the teaching and learning methods used in the program related to the teaching and learning strategy approved by the Academic Council in November 2021, appendix no (3), and these methods are compatible with the competencies of the graduate as shown in matrix no (3)

Matrix no. (3): Compatibility of competencies with teaching and learning methods

The competencies	Teaching and learning methods												
	On line / face to face lectures	Tutorials: sheets/ sketches	Projects	Problem solving	Brain storming	Practical: lab	Discovering	Site visit	Reports/ researches	Cooperative work	Presentation	Discussion	Modeling
C1													
C2													
C3													
C4.													
C5													
C6													
C7													
C8													
C9													
C10													
CR1													
CR2													
CR3.													
CR4													



14. Student Assessment Methods -

- Quick Exams (Quizzes)
- Mid-term exam
- Final Exam
- Exercises (Sheets / sketches)
- Projects
- Practical : Lab
- Oral exam
- Discussions
- Reports – Research
- Presentations
- Modeling

All the assessment methods used in the program are compatible with the teaching and learning methods, and these methods contribute the competencies of the graduate as shown in matrix no (4)

Matrix no. (4): Compatibility of competencies with assessment methods

The competencies	Assessment methods										
	Quizzes	Mid -term exam	Final exam	sheets/ sketches	projects	Practical: lab	Oral exam	discussions	Reports/ researches	presentation	modelling
C1											
C2											
C3.											
C4.											
C5											
C6											
C7											
C8											
C9											
C10											
CR1											
CR2											
CR3											
CR4											



15. Program Admission Requirements:

a. Program Entry Requirements

The student has to Pass all of the courses shown in the table below:

5 mathematic courses
engineering drawing course
courses of the preparatory level

b. Methods and rules for evaluating those courses enrolled in the program

- Rules for the Evaluation of Humanities, Basic Sciences, English and Compulsory Engineering Subjects:

Contracts, Bids & Liabilities- Engineering Economics- Seminar- Human Rights- Communication Skills- Negotiation Skills- Research Methods- Feasibility Studies- Calculus I- Calculus II- Calculus III- Differential Equation- Probability & Statistics- Linear Algebra and Matrices- Fundamental of Fluid Mechanics- Engineering Geology (Earth Systems)- General Mechanical & Electric Engineering- Strength and Testing of Materials

student work	30 degrees
Mid-term exam	20 degrees
Final exam	50 degrees

- Rules for the evaluation of theoretical, specialized and optional subjects Rules for the evaluation of specialized practical subjects

Environmental Science & Technology-Construction Materials & Quality Control-Field Plane & Topographic Surveying-Transportation & Traffic Engineering-Civil Engineering Cost Analysis & Project Management -Fundamentals of Hydraulic Engineering-Environmental & Sanitary Engineering-Engineering Surveying-Building Construction-Construction Materials & Quality Control II -Methods & Equipment for Construction I-Railway Engineering -Selected topics in Civil and Environmental Engineering-Civil Drawing-Civil Drawing II

student work	25 degrees
Mid-term exam	15 degrees
Final exam	60 degrees

- Rules for the evaluation of theoretical, specialized and optional subjects

Senior Project I-Senior Project II-Geotechnical Engineering Design-Structural Analysis I-Structural Analysis II- Geotechnical Engineering Structures- Structure Analysis III-Advanced Foundation Engineering- Earthquake Engineering- Steel Structure Design Reinforced Concrete Design I- Reinforced Concrete Design II-Design of Irrigation System-Highway Design-Advanced Steel Structure Analysis-Computer Methods in Structural Analysis & Design-Design Reinforced Concrete III-Design Reinforced Concrete IV

student work	40 degrees
Mid-term exam	20 degrees
Final exam	40 degrees

- Rules for the evaluation of laboratory materials:

Lab (1) General Physics, Lab (2) General Physics, Lab (1) General Chemistry- Construction Materials Lab-Field Plane Surveying-Geotechnical Engineering Lab

student work	50 degrees
Mid-term exam	10 degrees
Final exam	40 Degrees



16. Program Evaluation Methods

evaluator	The way	Sample
Final level students	questionnaire form	10% from students
graduators	questionnaire form	10% from students
Business owners	Business owners	Business owners
External evaluator	review report	Some courses of the program
another method		

17. Course Contents:

Core Courses (Institute Requirements)

Code	Course Name	Credit Hours	Prerequisite
BASE 303	Engineering Economics الاقتصاد الهندسي	3	Math201

Economic and cost concepts, the time value of money, single, multiple and series of cash flows, gradients, functional notation, nominal and effective interest rates, continuous compounding, rates of return. Computation and applications, economic feasibility of projects and worth of investments, comparison of alternatives. Replacement, depreciation and B.E. analysis. Introduction to risk analysis. Explores the economics concepts and theories of planning. Covers the bases and methods of economic analysis of engineering projects and the application of these principles in understanding economic activity of private and public engineering companies at various micro- and macroeconomic levels.

يهدف المقرر إلى تناول المفاهيم الاقتصادية ومفاهيم التكلفة، القيمة الزمنية للنقود، التدفقات النقدية الفردية والمتعددة والمتسلسلة، التدرجات، التدوين الوظيفي، أسعار الفائدة الاسمية والفعلية، المركب المستمر، معدلات العائد. الحسابات والتطبيقات، الجدوى الاقتصادية للمشاريع وقيمة الاستثمارات، مقارنة البدائل. الاستبدال والإهمال والتحليل وB.E. مقدمة لتحليل المخاطر. يستكشف المفاهيم الاقتصادية ونظريات التخطيط. يغطي أسس وأساليب التحليل الاقتصادي للمشاريع الهندسية وتطبيق هذه المبادئ في فهم النشاط الاقتصادي للشركات الهندسية الخاصة والعامة على مختلف مستويات الاقتصاد الجزئي والكلية.

Code	Course Name	Credit Hours	Prerequisite
BASE 306	Research Methods أساليب البحث العلمي	3	

Develops the skills to produce effective persuasive writing with a focus on organization, content, analysis of readings, critical thinking. Provides training in the use and integration of sources, library and online research.

هذا المنهج تطوير المهارات اللازمة لإنتاج كتابة مقنعة وفعالة مع التركيز على التنظيم والمحتوى وتحليل القراءات والتفكير النقدي. التدريب على استخدام وتكامل المصادر والمكتبات والبحث عبر الإنترنت.

Code	Course Name	Credit Hours	Prerequisite
BASE 307	Contracts, Bids & Liabilities التعاقد، المناقصات والالتزامات	2	

Contract definition, formation principles of a contract, performance or breach of contract obligations, termination of agreements, types of construction contracts and legal implications, specifications, legal organizational structures (agency, proprietorship, partnership, corporation).

تعريف العقد، مبادئ تكوين العقد، أداء أو الإخلال بالتزامات العقد، إنهاء الاتفاقيات، أنواع عقود البناء وأثارها القانونية، المواصفات، الهياكل التنظيمية القانونية (وكالة، ملكية، شراكة، شركة).



Code	Course Name	Credit Hours	Prerequisite
BASE 308	Seminar سيمينار	0	

Engineering Topics conducted on a Weekly or Monthly Basis discussions with speakers from Industry and professors from the different Departments. Students should at least attend one seminar every year.

موضوعات هندسية يتم إجراؤها على أساس مناقشات أسبوعية أو شهرية مع متحدثين من الصناعة وأساتذة من الأقسام المختلفة. يجب على الطلاب حضور ندوة واحدة على الأقل كل عام.

Code	Course Name	Credit Hours	Prerequisite
BASE 309	Human Rights حقوق انسان	0	

The course aims to identify the nature and concepts of human rights, the origin, sources, types of human rights and their applications in the engineering field and their relationship to the ethics and duties of the profession as well as the international institutional framework to deal with human rights issues and mechanisms for the protection of these rights at the international and national levels. It also addresses the definition of non-governmental organizations working in the field of human rights.

يهدف المقرر إلى التعرف على مفاهيم حقوق الإنسان، ومصادر وأنواع حقوق الإنسان، وتطبيقاتها في المجال الهندسي. كما يحدد أخلاقيات علاقاته وواجبات المهنة. وكذلك الإطار المؤسسي الدولي للتعامل مع حقوق الإنسان وآليات حماية قضايا الحقوق على المستوى الدولي والوطني. كما يتناول تعريف العمل غير الحكومي في مجال حقوق الإنسان.

Code	Course Name	Credit Hours	Prerequisite
BASE 401	Communication Skills مهارات اتصال	3	

Advanced technical communication skills, with emphasis on writing strategies for technical documents, oral presentations, and visual aids and Ethics of the engineering proficiency with emphasis on each departmental ethical and professional Licensure topic.

مهارات الاتصال التقنية المتقدمة، مع التركيز على استراتيجيات الكتابة للوثائق الفنية والعروض التقديمية الشفهية والمساعدات البصرية وأخلاقيات الكفاءة الهندسية مع التركيز على موضوعات الترخيص الأخلاقية والمهنية لكل قسم.

Code	Course Name	Credit Hours	Prerequisite
BASE 402	Feasibility Studie دراسة جدوى المشروعات	3	

This course introduces students to the meaning, importance, and effects of feasibility study. It also deals with the analysis of decision problems under uncertainty, partial information, risk and competition. Considers the analytic hierarchy process outranking procedures and multi-attribute utility theory.

يقدم هذا المقرر الدراسي للطلاب معنى وأهمية وتأثيرات دراسة الجدوى. كما يتناول تحليل مشاكل القرار في ظل عدم اليقين والمعلومات الجزئية والمخاطر والمنافسة. يأخذ في الاعتبار عملية التسلسل الهرمي التحليلي التي تتفوق على الإجراءات ونظرية المنفعة متعددة السمات.

Code	Course Name	Credit Hours	Prerequisite
BASE 404	Negotiation Skills مهارات التفاوض	3	-

Negotiation styles and processes to help students conduct and review negotiations. Workshop format integrating intellectual and experiential learning. Exercises, live and field examples, individual and small group reviews.

أساليب وعمليات التفاوض لمساعدة الطلاب على إجراء ومراجعة المفاوضات شكل ورشة عمل يدمج التعلم الفكري والتجريبي. تمارين وأمثلة حية وميدانية ومراجعات فردية ومجموعات صغيرة.



English Course Description

Students are required to take an evaluation exam and accordingly can be decided which level to be admitted. Minimum requirements of English courses are 6 credit hours.

Code	Course Name	Credit Hours	Prerequisite
ENGL 101	Elementary English (1)	3	Exam-

Develops proficiency in critical expository writing, critical reading and greater fluency in expression. Focuses on the writing process with an emphasis on developing the student's voice, organizing and developing ideas independently within the context of academic writing. Introduces library research and use of sources. Introductory level English.

تطوير الكفاءة في الكتابة التفسيرية النقدية، والقراءة النقدية وزيادة الطلاقة في التعبير. يركز على عملية الكتابة مع التركيز على تنمية صوت الطالب وتنظيم الأفكار وتطويرها بشكل مستقل في سياق الكتابة الأكاديمية. - التعريف بالبحث المكتبي واستخدام المصادر. المستوى التمهيدي باللغة الإنجليزية.

Code	Course Name	Credit Hours	Prerequisite
ENGL 102	Lower Intermediate English (2)	3	ENGL 101 or exam

Develops the skills to produce effective persuasive writing with a focus on organization, content, analysis of readings, critical thinking. Provides training in the use and integration of sources, library and online research. With Emphasis on the language skills.

يطور المهارات اللازمة لإنتاج كتابة مقنعة فعالة مع التركيز على التنظيم والمحتوى وتحليل القراءات والتفكير النقدي. يوفر التدريب على استخدام وتكامل المصادر والمكتبات والبحث عبر الإنترنت. مع التركيز على المهارات اللغوية.

Mathematics Course Description

Code	Course Name	Credit Hours	Prerequisite
Math101	Calculus I (تفاضل و تكامل (1)	3	--

Limits of one-variable functions, continuity and differentiability. Extreme and Curve sketching. Related rates. Linear approximation. Differentiation of Trigonometric functions. Applications of the derivative.

حدود الدوال ذات المتغير الواحد والاستمرارية والتمايز. تمايز الدوال المثلثية. القيم المتطرفة ورسم المنحنى. معدلات مرتبطة. تقريب خطي. تطبيقات المشتقات.

Code	Course Name	Credit Hours	Prerequisite
Math102	Calculus II (تفاضل و تكامل (2)	3	Math101 or exam

Definite and indefinite integrals. The fundamental theorem of calculus and applications of the definite integral. Area, arc length, volumes and surfaces of revolution. Differentiation and integration of Exponential, Logarithmic, Trigonometric and other transcendental functions. Techniques of integration. Numerical integration. Improper integrals

التكاملات المحددة وغير المحددة. النظرية الأساسية في حساب التفاضل والتكامل وتطبيقات التكامل المحدد. المساحة وطول القوس والأحجام وأسطح. التمايز والتكامل بين الدوال الأسية واللوغاريتمية والمثلثية وغيرها من الدوال المتعالية. تقنيات التكامل. تكامل رقمي. التكاملات غير الصحيحة.

Code	Course Name	Credit Hours	Prerequisite
MATH 201	Calculus III (تفاضل و تكامل (3)	3	Math102

Sequences and series (including power series). Vectors and planes. Surfaces. Partial differentiation. Introduction to double integrals (including double integrals in polar coordinates). Multiple integrals. Parametric equations. Cylindrical and spherical coordinates. Vector-valued functions, vector calculus: Green's Theorem, Gauss Theorem and Stokes' Theorem and their applications. Complex numbers.



المتتابعات والمتسلسلات (بما في ذلك متسلسلة القوى). المتجهات والطائرات. الأسطح. التمايز الجزئي. مقدمة عن التكاملات المزدوجة (بما في ذلك التكاملات المزدوجة في الإحداثيات القطبية). تكاملات متعددة. المعادلات البارامترية. الإحداثيات الأسطوانية والكروية. دوال ذات قيمة متجهة، حساب التفاضل والتكامل المتجه: نظرية جرين، نظرية جاوس ونظرية ستوكس وتطبيقاتها. ارقام مركبة.

Code	Course Name	Credit Hours	Prerequisite
MATH 202	Differential Equations معادلات تفاضلية	3	Math201

Covers mathematical formulation of ordinary differential equations, methods of solution and applications of first order and second order differential equations, power series solutions, solutions by Laplace transforms and solutions of first order linear systems. In addition, it covers functions and limits, differentiation with applications including maxima and minima, related rates, approximations, theory of integration with applications including areas, volumes, lengths, moments, center of mass and work. The course has a computer laboratory component.

يغطي الصياغة الرياضية للمعادلات التفاضلية العادية، وطرق الحل وتطبيقات المعادلات التفاضلية من الدرجة الأولى والثانية، وحلول متسلسلات القوى، وحلول تحويلات لابلاس، وحلول الأنظمة الخطية من الدرجة الأولى. بالإضافة إلى ذلك، فإنه يغطي الوظائف والحدود، والتمايز مع التطبيقات بما في ذلك الحد الأقصى والحد الأدنى، والمعادلات ذات الصلة، والتقريبات، ونظرية التكامل مع التطبيقات بما في ذلك المناطق والأحجام والأطوال والعزوم ومركز الكتلة وعمل. تحتوي الدورة على مكون مختبر الكمبيوتر.

Core	Prerequisite	Credit Hours	Prerequisite
MATH 301	Probability & Statistics تطبيقات احتمالية والاحصاء	3	Math 102

The course introduces students to some important statistical concepts and techniques that are of common application in engineering. Covers graphical and numerical summaries of data, plotting data, probabilities of random events, random variables, properties of density and distribution functions, measures of location and dispersion, expected values, independence of random variables, scaling and adding random variables, the binomial Poisson and normal distributions, the central limit theorem, hypothesis testing, confidence intervals, t test, paired t test, standard errors, least squares, residuals, correlation, examples of regression, quality control, clustering of rare events.

يعرّف هذا المقرر الطلاب ببعض المفاهيم والتقنيات الإحصائية المهمة التي يتم تطبيقها بشكل شائع في الهندسة. يغطي الملخصات الرسومية والعددية للبيانات، وتخطيط البيانات، واحتمالات الأحداث العشوائية، والمتغيرات العشوائية، وخصائص الكثافة ووظائف التوزيع، ومقاييس الموقع والتشتت، والقيم المتوقعة، واستقلال المتغيرات العشوائية، وقياس وإضافة المتغيرات العشوائية، وبواسون ذات الحدين و التوزيعات الطبيعية، نظرية الحد المركزي، اختبار الفرضيات، فترات الثقة، اختبار t، اختبار t المقترن، الأخطاء المعيارية، المربعات الصغرى، البقايا، الارتباط، أمثلة على الانحدار، مراقبة الجودة، تجميع الأحداث النادرة.

Core	Prerequisite	Credit Hours	Prerequisite
MATH 302	Linear Algebra and Matrices الجبر الخطي والمصفوفات	3	MATH202

Covers systems of linear equation, algebra of matrices, linear transformations, determinants, vector spaces, inner product spaces, eigenvalues and eigenvectors, diagonalization and orthogonally, special matrices and applications. Numerical solutions of differential equations. The use of computer software such as MathCAD, mathematic, or MATLAB is essential.

يغطي أنظمة المعادلات الخطية، وجبر المصفوفات، والتحويلات الخطية، والمحددات، ومساحات المتجهات، ومساحات المنتج الداخلي، والقيم الذاتية والمتجهات الذاتية، والتعامد، والمصفوفات والتطبيقات الخاصة. الحلول العددية للمعادلات التفاضلية. يعد استخدام برامج الكمبيوتر مثل MathCAD أو الرياضيات أو MATLAB أمرًا ضروريًا.



Physics Course Description

Code	Course Name	Credit Hours	Prerequisite
PHYS 101	Classical Mechanics, Sound, Heat فيزياء 1	3	--
PHYS 111	General Physics Laboratory I معمل فيزياء عامة	1	Concurrent with PHYS 101

An introduction to classical mechanics covering vectors, applications of Newton's laws, conservation laws and forces, motion in a plane, circular motion, equilibrium and elasticity, rotational motion, simple harmonic motion, energy and power; mechanical and sound waves, temperature, heat and the first law of thermodynamics.

مقدمة في الميكانيكا الكلاسيكية. الحركة في بعد واحد. المتجهات والحركة في البعدين، قوانين الحركة. طاقة النظام، الحفاظ على الطاقة. الزخم الخطي والاصطدامات. دوران جسم صلب حول محور ثابت. الزخم الزاوي. التوازن الساكن والمرونة. الجاذبية الكونية. مقدمة عن الموجات الصوتية والحرارة

Code	Course Name	Credit Hours	Prerequisite
PHYS 102	Electricity and Magnetism	3	PHYS 101
PHYS 112	General Physics Laboratory II	1	Concurrent with PHYS 102

Covers electricity (electric fields, including Gauss's law; electric potential; capacitors and resistors; DC circuits), magnetism (sources of the magnetic field, including Ampere's law; induction, including Faraday's law and Lenz's law), and alternating current circuits, as well as introductory material on electromagnetic waves. The laboratory includes experiments illustrating the principles, laws and concepts discussed in the course.

يغطي هذا المقرر المجالات الكهربائية وقانون غاوس والجهد الكهربائي. السعة والعوازل. التيار والمقاومة، والمباشرة - الدوائر الحالية. المجالات المغناطيسية، مصادر المجالات المغناطيسية. قانون فاراداي والحث. دوائر التيار المتناوب والموجات الكهرومغناطيسية.

Chemistry Course Description

Code	Course Name	Credit Hours	Prerequisite
CHEM 101	General Chemistry I for Engineers(1)	3	---
CHEM 111	General Chemistry Lab(1)	1	Concurrent with CHEM 101

Chemical stoichiometry; atomic structure and periodicity; an overview of chemical bonding with a discussion of models and theories of covalent bonding; introduction to structure and chemistry of organic compounds; elementary nuclear chemistry.

قياس العناصر الكيميائية؛ التركيب الذري ودورية. لمحة عامة عن الترابط الكيميائي مع مناقشة نماذج ونظريات الترابط التساهمي؛ مقدمة لتركيب وكيمياء المركبات العضوية؛ الكيمياء النووية الابتدائية.

Engineering Course Description

Code	Course Name	Credit Hours	Prerequisite
ENGR 101	Introduction to Engineering	1	-

History of engineering. Engineering fields of specialization and curricula. The engineering profession: team work, professionalism, ethics, licensing, communication and societal obligations. Engineering support personnel and activities. Engineering approach to problem solving. Examples of major engineering projects. Course project.

تاريخ الهندسة. مجالات التخصص والمناهج الهندسية. مهنة الهندسة: العمل الجماعي، الاحترافية، الأخلاق، الترخيص، التواصل والالتزامات المجتمعية. موظفي الدعم الهندسي والأنشطة. المنهج الهندسي لحل المشكلات. أمثلة على المشاريع الهندسية الكبرى. مشروع الدورة.

Code	Course Name	Credit Hours	Prerequisite
ENGR 102	Engineering Drawing & projection	2	--

Introductory descriptive geometry. Orthographic and pictorial drawing. Sectional views, auxiliary views, and conventions. Dimensioning. Free hand sketching and both manual and computer-aided drafting.



مقدمة في الهندسة الوصفية. الرسم الإيملائي والصوري. وجهات النظر المقطعية، وجهات النظر المساعدة، والاتفاقيات. الأبعاد. رسم يدي مجاني، وكلاهما - الصياغة اليدوية وبمساعدة الحاسوب.

Code	Course Name	Credit Hours	Prerequisite
ENGR 105	Engineering Production	1	--

This module is designed to provide freshmen students with an understanding of the traditional machine tools used in forming and machining processes: Turning, milling, grinding, drilling, boring, shaping, planing, shearing, bending, and rolling machines, as well as welding and casting equipment, wood working, and polymeric machines. An extensive coverage of health and safety into workshop practice, focusing on hazards control, safety precautions, and industrial hygiene, to develop a responsible awareness of hazards.

تم تصميم هذه الوحدة لتزويد الطلاب الجدد بفهم للأدوات الآلية التقليدية المستخدمة في عمليات التشكيل والتصنيع الآلي: آلات الخراطة، والطحن، والحفر، والمملة، والتشكيل، والتخطيط، والقص، والثني، والدرفلة، بالإضافة إلى آلات اللحام ومعدات الصب، والأعمال الخشبية، وآلات البوليمر تغطية واسعة النطاق للصحة والسلامة في ممارسات ورشة العمل، مع التركيز على التحكم في المخاطر، واحتياطات السلامة، والنظافة الصناعية، لتطوير الوعي المسؤول بالمخاطر

Code	Course Name	Credit Hours	Prerequisite
ENGR 103	Engineering Mechanics I (Static)	3	--

Fundamentals of mechanics. Equilibrium of practices, forces in space, equivalent systems, equilibrium of rigid bodies, distributed forces, center of gravity, internal actions, analysis of simple structures and machine parts. Friction. Moment of inertia.

أساسيات الميكانيكا. توازن الممارسات، القوى في الفضاء، الأنظمة المتكافئة، توازن الأجسام الصلبة، القوى الموزعة، مركز الثقل، الأفعال الداخلية، تحليل الهياكل البسيطة وأجزاء الآلات. احتكاك. لحظة من الجمود.

Code	Course Name	Credit Hours	Prerequisite
ENGR 104	Engineering Mechanics II (Dynamic)	3	ENGR 103, MATH 101

Kinematics and kinetics of a particle, system of particles, and rigid bodies. Energy and momentum methods. Engineering applications.

دراسة علم حركة الجسم ونظام الجزيئات والأجسام الجاسئة. الطاقة وأساليب قوة الدفع. التطبيقات الهندسية.

Code	Course Name	Credit Hours	Prerequisite
ENGR 203	Strength and Testing of Materials	3	ENGR 103

General view on the different properties of materials; physical properties, chemical properties and mechanical properties. Building materials. Binder materials: lime, gypsum and cement. Properties and testing of concrete materials: cement, aggregates, water. Static tension test and Types of reinforcing steel and tensile test. Specifications of building materials. Scientific visits to a cement factory, steel factory and aggregate quarry.

نظرة عامة على الخصائص المختلفة للمواد؛ الخواص الفيزيائية والخواص الكيميائية والخواص الميكانيكية. مواد بناء. المواد الرابطة: الجير والجبس والأسمنت. خواص واختبارات المواد الخرسانية: الأسمنت، الركام، الماء. اختبار الشد الساكن وأنواع حديد التسليح واختبار الشد. مواصفات مواد البناء. زيارات علمية لمصنع الأسمنت ومصنع الصلب والركام مقلع.

Code	Course Name	Credit Hours	Prerequisite
ENGR 204	Fundamental of Fluid Mechanics أساسيات ميكانيكا الموائع	3	ENGR 104

Fluid properties, fluid statics, Buoyancy and floatation, Kinematics of fluid flow. Energy considerations in steady flow. Conservation of mass and energy, continuity and Bernoulli's equations. Forces due to fluids in motion, momentum equation, similitude and dimensional analysis – Steady incompressible flow in pressure conduits: Laminar Viscous effects for laminar and turbulent flow. Friction and Minor losses – pipelines and pipe networks.



خواص الموائع، استاتيكا الموائع، الطفو والطفو، حركات جريان الموائع. اعتبارات الطاقة في التدفق المستمر. حفظ الكتلة والطاقة والاستمرارية ومعادلات برنولي. القوى الناجمة عن الموائع المتحركة، معادلة الزخم، التشابه وتحليل الأبعاد – الجريان الثابت غير القابل للضغط في قنوات الضغط: التأثيرات اللزجة الصفحية للجريان الصفحي والمضطرب. الاحتكاك والخسائر الطفيفة – خطوط الأنابيب وشبكات الأنابيب.

Code	Course Name	Credit Hours	Prerequisite
ENGR 205	Geology & Geotechnical Engineering (Earth Systems)	3	--

Minerals and rock types, superficial deposits, interpretation of geologic maps, structural geology, geologic exploration, ground water cycle, geology of Egypt and greater Cairo.

المعادن وأنواع الصخور، الترسبات السطحية، تفسير الخرائط الجيولوجية، الجيولوجيا التركيبية، الاستكشافات الجيولوجية، دورة المياه الجوفية، جيولوجيا مصر والقاهرة الكبرى.

Code	Course Name	Credit Hours	Prerequisite
ENGR 302	General Mechanical & Electrical Engineering	3	PHYS 102, MATH 201

Ideal and practical sources, Energy of a supply source, Series and parallel connections of loads. Voltage dividers & current dividers. Fuses and automatic circuit breaker. Three-phase systems; transmission lines; electrical insulation; star & delta connections; electrical measurements; transformers; DC machines; synchronous machines; induction motors, switchgear and substation apparatus, electric heating. Fundamentals of energy transformation and exchange systems. Sizing, matching and installation of electrical, mechanical, plumbing, heating, ventilation and air conditioning (HVAC) and machining systems.

المصادر المثالية والعملية، طاقة مصدر الإمداد، توصيلات الأحمال المتوازية والمتوازية. مقسمات الجهد ومقسمات التيار. الصمامات وقواطع الدائرة الأوتوماتيكية. أنظمة ثلاثية الطور خطوط نقل؛ عزل كهربى؛ اتصالات النجمة والدلتا؛ القياسات الكهربائية. محولات؛ آلات العاصمة. آلات متزامنة المحركات الحثية، المفاتيح الكهربائية وأجهزة المحطات الفرعية، التدفئة الكهربائية. أساسيات تحويل الطاقة وأنظمة التبادل. تحجيم ومطابقة وتركيب الأنظمة الكهربائية والميكانيكية والسباكة والتدفئة والتهوية وتكييف الهواء وأنظمة التشغيل الآلى.

Code	Course Name	Credit Hours	Prerequisite
CECE 101	Fundamentals to Computer Programming(I)	3	--

Introduction to the discipline of computing. Computer systems, number systems, data representation and basic computer organization. Basic Math concepts, functions and propositional logic. Problem solving, abstraction, design and programming. Selection structures, repetition and loop statements. Modular programming. Basic testing and debugging of programs. Introduction to programming in C++ or JAVA or any other Programming Language. Professional Ethics for computer professionals.

مقدمة في تخصص الحوسبة. أنظمة الكمبيوتر وأنظمة الأرقام وتمثيل البيانات وتنظيم الكمبيوتر الأساسي. مفاهيم الرياضيات الأساسية والوظائف والمنطق المقترح. حل المشكلات والتجريد والتصميم والبرمجة. هياكل الاختيار والتكرار وبيانات الحلقة. البرمجة المعيارية. الاختبار الأساسي وتصحيح الأخطاء للبرامج. مقدمة للبرمجة بلغة C++ أو JAVA أو أي لغة برمجة أخرى. أخلاقيات المهنة لمحترفي الكمبيوتر.

Architecture And Design Engineering Course Description

Code	Course Name	Credit Hours	Prerequisite
ARCH 205	Building Construction 1	2	--

The course aims to clarify the main elements of the building, building materials, and different building construction systems (traditional and new systems) and to train the student to draw the construction details through the study: Loads affecting the building, building methods (bearing walls, skeleton structures) and structural elements of the building, wall thickness and bonds, openings, lintels and arches, vaults and domes.



يهدف المقرر إلى توضيح العناصر الرئيسية للبناء ومواد البناء وأنظمة تشييد المباني المختلفة (الأنظمة التقليدية والجديدة) وتدريب الطالب على رسم التفاصيل الإنشائية من خلال دراسة: الأحمال المؤثرة على المبنى، طرق البناء (الحوائط الحاملة)، الهياكل العظمية والعناصر الإنشائية للمبنى، سمك الجدران والروابط، الفتحات، السواكف والأقواس، القباب والقباب.

Civil Engineering Course Description

Code	Course Name	Credit Hours	Prerequisite
CVEE 101	Environmental Science & Technology	2	-

Introduction to environmental quality and the technical background necessary for understanding environmental issues, controlling environmental degradation, and preserving air and water quality. Definition of the Environment, introduction to Environmental Science- Atmosphere and hydrologic cycle- air pollution – water pollution – soil pollution – types of environmental pollution – Environment development – environmental friendly projects: potable water. Drainage.

مقدمة لجودة البيئة والخلفية التقنية اللازمة لفهم القضايا البيئية، والسيطرة على التدهور البيئي، والحفاظ على جودة الهواء والمياه. تعريف البيئة، مقدمة في علوم البيئة – الغلاف الجوي والدورة الهيدرولوجية – تلوث الهواء – تلوث المياه – تلوث التربة – أنواع التلوث البيئي – تنمية البيئة – المشاريع الصديقة للبيئة: المياه الصالحة للشرب. تصريف المياه.

Code	Course Name	Credit Hours	Prerequisite
CVEE 110	Civil Drawing	1	ENGR 102

Metallic sheds: Column base, Riveted joints, Connections between girders and beams, Columns and beams. Steel bridges: Truss connections, Main girders (upper and lower chords, verticals and diagonals), Cross girders and stringers. Reinforced concrete structures: Footings, Column slabs and beams. Irrigation structures: Earth works, Retaining walls, Bridges, Culverts, Syphons, Regulators, Weirs, Symmetrical and unsymmetrical locks.
القشور المعدنية: قاعدة الأعمدة، الوصلات المثبتة، الوصلات بين الكمرات والكرات، الأعمدة والكمرة. الجسور الفولاذية: وصلات الجمالون، العوارض الرئيسية (الأوتار العلوية والسفلية، العمودية والأقطارية)، العوارض المتقاطعة والأوتار. الهياكل الخرسانية المسلحة: القواعد، ألواح الأعمدة والكمرات. منشآت الري: الأعمال الأرضية، الجدران الاستنادية، الجسور، القنوات، السيفونات، المنظمات، السدود، الأقفال المتماثلة وغير المتماثلة.

Code	Course Name	Credit Hours	Prerequisite
CVEE 201	Construction Materials & Quality Control	3	ENGR 203
CVEE 202	Construction Materials Lab	1	Concurrent with CVEE 201

Properties and testing of fresh and hardened concrete: Advantage and disadvantage of concrete. , Concrete industry; batching, mixing, transportation, casting, compaction, curing and finishing. ,Segregation and bleeding. Admixtures and additives, bituminous materials used in construction and maintenance of structures, roads and pavements),. Mix design – concrete trial mixes on construction site., Shrinkage and Creep of concrete. , Strength and Durability of concrete. Corrosion of reinforcing steel. Tests and quality control of various construction materials. Corrosion of reinforcing steel.

Tests and quality control of various construction materials.
خصائص واختبار الخرسانة الطازجة والمتصلدة: مزايا وعيوب الخرسانة. , صناعة الخرسانة ; الخلط والنقل والصب والضغط والمعالجة والتشطيب. , الفصل والنزيف. الخلطات والمضافات، المواد البيتومينية المستخدمة في بناء وصيانة المنشآت والطرق والأرصفت). , تصميم الخلطات – الخلطات الخرسانية التجريبية في موقع البناء، انكماش وزحف الخرسانة. قوة ومتانة الخرسانة. تآكل حديد التسليح. اختبارات ومراقبة الجودة لمواد البناء المختلفة.

Code	Course Name	Credit Hours	Prerequisite
CVEE 203	Field Plane & Topographic Surveying	3	MATH102

Introduces geodetic positions, coordinate systems, datum, basic measurement procedures and use of surveying instruments. Covers principles and practice in measuring distance, elevation, and angles; and leveling, traverse, and earth work computations. Total station instrument and its applications in setting out coordinates, Methods of setting out highways, Roads, Airports and runways and their correlated different types of curves, Tunnel survey, Setting out of

water, Sewer and infrastructure networks, Setting out of construction 3D deformation mentoring. Introduces GPS and GIS.

يتعرف على المواقع الجيوديسية – أنظمة الإحداثيات – الأجهزة المساحية الحديثة – تصميم المنحنيات أفقياً وعمودياً. الأجهزة المساحية (ميزان – ثيودوليت – تاكوميتر) – اختلافات المستوى – الروبيرير – الأخطاء في الموازنة – جداول الموازنة – المقاطع الطولية والعرضية وأهم البيانات التي تصفها – الشبكات والأخطاء والتصحيح – تصميم وتخطيط المنحنيات. تطبيقات متكاملة ومحطات مراقبة في طرق توقيع الإحداثيات والطرق والمطارات والطرق - منطقة الأنفاق - شبكات المياه والصرف الصحي وخطوط المرافق العامة. مقدمة في نظم المعلومات الجغرافية، نظام تحديد المواقع.

Code	Course Name	Credit Hours	Prerequisite
CVEE 204	Field Plane Surveying	1	Concurrent CVEE 203

Covers fundamental principles of surveying; Height methods - Ropier - errors in the budget- the codification of the budget. Maps: general idea - the basis of maps - topographic maps. Contour lines and methods drawn: automated drawing maps on the Automated Digital Tracer. Engineering - GPS role in the area of engineering projects and various methods to determine blob's locations on the Earth's surface.

يغطي المبادئ الأساسية للمسح. طرق الارتفاع - الروبيرير - الأخطاء في الموازنة - تدوين الموازنة. الخرائط: الفكرة العامة – أساس الخرائط – الخرائط الطبوغرافية. الخطوط الكنتورية وطرق رسمها: خرائط الرسم الآلي على جهاز التنبع الرقمي الآلي. الهندسة - دور نظام تحديد المواقع العالمي (GPS) في مجال المشاريع الهندسية والطرق المختلفة لتحديد مواقع النقط على سطح الأرض.

Code	Course Name	Credit Hours	Prerequisite
CVEE 205	Transportation & Traffic Engineering	3	CVEE 201

Introduction to transportation planning and engineering; transportation planning tools, concepts of geometric and structural design and construction of highways, and concepts of geometric design of railways: data collection, trip generation, trip distribution, factors underlying the choice of mode, traffic assignment, modeling and evaluation techniques, use of planning software packages, development of alternatives, and evaluation of civil engineering projects. Introduces Intelligent Transportation Systems (ITS).

مقدمة في التخطيط الهندسي والنقل، أدوات تخطيط النقل، مفاهيم التصميم الهندسي والإنشائي وإنشاء الطرق السريعة، مفاهيم التصميم الهندسي للسكك الحديدية: جمع البيانات، حركة المرور، توزيع الاتجاهات، العوامل الكامنة وراء اختيار الوسائل والوسائل، تكاليف المرور والمهام، طرق النمذجة والتقييم، استخدام حزم برمجيات التخطيط، تطوير البدائل، تقييم مشاريع الهندسة المدنية، أنظمة النقل الذكية ITS.

Code	Course Name	Credit Hours	Prerequisite
CVEE 206	Civil Engineering Cost Analysis & Project Management	3	-

Covers economic analysis and evaluation of civil engineering proposals utilizing time-value and related factors; time value of money; worth of investments and economic evaluation of alternative choices; replacement and retention decisions; selection from independent projects; inflation; cost estimating fundamentals; parametric cost estimating; depreciation methods; breakeven analysis; benefit cost analysis; sensitivity analysis and decision making under risk. Introduction to construction management: participants involved, types of construction, project life cycle, contractual relationships and responsibilities, International contracts and managerial functions.

يغطي التحليل الاقتصادي وتقييم مقترحات الهندسة المدنية باستخدام القيمة الزمنية والعوامل ذات الصلة؛ القيمة الزمنية للنقود، قيمة الاستثمارات والتقييم الاقتصادي للخيارات البديلة، قرارات الاستبدال والاحتفاظ، اختيار المشاريع المستقلة، التضخم، أساسيات تقدير التكلفة، تقدير التكلفة البارامترية، طرق الاستهلاك، تحليل التعادل، تحليل تكلفة المنفعة، تحليل الحساسية واتخاذ القرارات تحت المخاطر. مقدمة لإدارة الإنشاءات: المشاركون المشاركون، أنواع الإنشاءات، دورة حياة المشروع، العلاقات والمسؤوليات التعاقدية، العقود الدولية والوظائف الإدارية.

Code	Course Name	Credit Hours	Prerequisite
CVEE 211	Civil Drawing II	1	CVEE 210

This course is concerned with an introduction to the general use of computers and file management. It covers 2D drawing using several graphics software programs to enable students to execute various 2D Civil drawings in the forms



of plans, elevations and sections. This course will prepare students to be computer-literate, familiar with commercial software and provide a basic working vocabulary and knowledge of computing and information concepts.

يهتم هذا المقرر بمقدمة للاستخدام العام لأجهزة الكمبيوتر وإدارة الملفات. ويغطي الرسم ثنائي الأبعاد باستخدام العديد من برامج الرسومات لتمكين الطلاب من تنفيذ رسومات مدنية ثنائية الأبعاد متنوعة في أشكال المخططات والارتفاعات والأقسام. ستعمل هذه الدورة على إعداد الطلاب ليكونوا ملمين بالكمبيوتر، وعلى دراية بالبرامج التجارية، وتوفير مفردات العمل الأساسية ومعرفة بمفاهيم الحوسبة والمعلومات.

Code	Course Name	Credit Hours	Prerequisite
CVEE 301	Structural Analysis I	3	ENGR 103

Analysis of statically determinate structures under static loads; reaction of supports, Stability of structures, member forces in trusses, normal, shear and bending moment diagrams for beams & frames, inclined structures, trusses.

تحليل الهياكل المحددة بشكل ثابت تحت الأحمال الساكنة؛ تفاعل الدعامات، استقرار الهياكل، قوى الأعضاء في الجمالونات، مخططات عزم القص والانحناء للكمرات والإطارات، الهياكل المائلة، الجمالونات.

Code	Course Name	Credit Hours	Prerequisite
CVEE 302	Structural Analysis II	3	CVEE 301, ENGR 203

Normal stresses and shear stresses, closed frames, Arches, influence lines. Analysis of statically indeterminate structures by three-moment equation, the method of consistent deformation, slope-deflection (Conjugate beam), Approximate analysis of statically indeterminate structures. Matrix force and displacement methods for beams and frames analysis.

الاجهادات العادية واجهادات القص، الاطر المغلقة، الاقواس، خطوط التأثير. تحليل الهياكل غير المحددة استاتيكيًا بمعادلة العزم الثلاثي، طريقة التشوه الثابت، الميل-الانبعاج (الكملة المتصل)، التحليل التقريبي للهياكل غير المحددة استاتيكيًا. طرق قوة المصفوفة والإزاحة لتحليل الكمرات والإطارات.

Code	Course Name	Credit Hours	Prerequisite
CVEE 303	Geotechnical Engineering Structures	3	ENGR 205
CVEE 304	Geotechnical Engineering Lab	1	Concurrent CVEE 303

Introduction to Geotechnical Engineering - characteristics and components of soil types- Water flow in soil media - the basic properties of the soil: natural properties - gradation - textures and borders Oterberg - Classification of soil - soil permeability , Stress-Strain of soil, consolidation of soil – soil compaction , Experimental measurement. Applications using the code of Egyptian soil mechanics.

مقدمة في الهندسة الجيوتقنية - خصائص أنواع التربة ومكوناتها - انتشار الماء خلال التربة - الخواص الأساسية للتربة: الخواص الطبيعية - التدرج - القوام وحدود أوتربورج - تصنيف التربة - نفاذية التربة - أنظمة ضغط الانفعالات والهبوط - دمك التربة: الاختبارات المعملية وطرق ضغط الموقع. التطبيقات باستخدام كود ميكانيكا التربة المصرية.

Code	Course Name	Credit Hours	Prerequisite
CVEE 305	Steel Structure Design	3	CVEE 302

Concepts of elastic design of steel structures, type of loading, structural systems for buildings and bridges, elastic design and analysis of structural members, tension members, compression members, beams, columns, and connections.

مفاهيم التصميم المرن للمنشآت الفولاذية، نوع التحميل، الأنظمة الإنشائية للمباني والجسور، التصميم المرن وتحليل الأعضاء الإنشائية، أعضاء التوتر، أعضاء الضغط، الكمرات، الأعمدة، والوصلات.



Code	Course Name	Credit Hours	Prerequisite
CVEE 306	Design of Reinforced Concrete Design I	3	CVEE 301

Properties of plain concrete and reinforced concrete, behavior of composite sections, ultimate strength and working stress, load distribution, design of structural elements, beams (Simple beams, continuous beams, cantilever beams), Check of shears, columns (Short), detailing of reinforcing steel. Analysis and design of beams sectors (rectangular sectors and in the form of (T and L) sections - verification of shear - design short columns - reinforcement details - design in accordance Egyptian code .

خواص الخرسانة العادية والخرسانة المسلحة، سلوك المقاطع المركبة، القوة القصوى وإجهاد التشغيل، توزيع الأحمال، تصميم العناصر الإنشائية، الكمرات (الكمرات البسيطة، الكمرات المستمرة، الكمرات الكابولية)، فحص المقصات، الأعمدة (القصيرة)، تفصيل تعزيز الصلب. تحليل وتصميم قطاعات الكمرات (القطاعات المستطيلة وعلى شكل مقاطع تي - إل - التحقق من القص - تصميم الأعمدة القصيرة - تفاصيل التسليح) التصميم طبقاً للكود المصري.

Code	Course Name	Credit Hours	Prerequisite
CVEE 307	Fundamentals of Hydraulic Engineering	3	ENGR 204

Uniform flow in open channels: Chezy and Manning Equations – specific energy- critical depth – Hydraulic jump – Energy and force equations and applications / Non-uniform flow in Open channels: Flow profiles- differential equation of varied flow – integration of the differential equation of gradually varied flow, hydraulic machines (Pumps and Turbines): Types, Performance and testing.

الجريان المنتظم في القنوات المفتوحة: معادلات تشيزي ومانينغ – الطاقة النوعية – العمق الحرج – القفز الهيدروليكي – معادلات وتطبيقات الطاقة والقوة / الجريان غير المنتظم في القنوات المفتوحة: مقاطع الجريان – المعادلة التفاضلية للتدفق المتنوع – تكامل المعادلة التفاضلية للتدفق المتغير تدريجياً التدفق والآلات الهيدروليكية (المضخات والتوربينات): الأنواع والأداء والاختبار.

Code	Course Name	Credit Hours	Prerequisite
CVEE 308	Environmental & Sanitary Engineering	3	CVEE 307

Purification works of Potable water – design of purification works- treatment of sewage works design of sewage – treatment works. Water quality. Material balance relationships and water pollution control. Water demand. Drinking water: collection, treatment, distribution and quality assurance. Domestic and industrial wastewater collection, treatment and disposal, planning and designing of water & wastewater treatment methods. Air-quality and air-pollution control, Air quality standards & air quality treatment & control.

أعمال تنقية مياه الشرب – تصميم أعمال التنقية – أعمال معالجة الصرف الصحي – تصميم أعمال معالجة الصرف الصحي. جودة المياه. علاقات التوازن المادي ومكافحة تلوث المياه. الطلب على المياه. مياه الشرب: الجمع والمعالجة والتوزيع وضمان الجودة. جمع مياه الصرف الصحي المنزلية والصناعية ومعالجتها والتخلص منها وتخطيط وتصميم طرق معالجة المياه ومياه الصرف الصحي. مراقبة جودة الهواء وتلوث الهواء ومعايير جودة الهواء ومعالجة ومراقبة جودة الهواء.

Code	Course Name	Credit Hours	Prerequisite
CVEE 310	Geotechnical Engineering Design	3	CVEE 303

Covers subsurface exploration and site investigation including in-situ testing and evaluation; bearing capacity of shallow foundations in different types of soils; settlement analysis (consolidation and immediate); Earth pressure theories. Shear Strength. Slope Stability and methods of stability analysis. Dewatering. Covers computer aided profile data reduction and recording, interpretation of field and laboratory data, design of retaining structures.

يغطي المقرر الاستكشاف تحت السطح ودراسة الموقع بما في ذلك الاختبار والتقييم، قدرة تحمل الأساسات الضحلة في أنواع مختلفة من التربة، تحليل التسوية (التوحيد والفوري)، نظريات ضغط الأرض، قوة القص، استقرار المنحدر وطرق تحليل الاستقرار، نزح المياه، الكمبيوتر بمساعدة تقليل بيانات الملف الشخصي وتسجيلها وتفسير البيانات الميدانية والمخبرية. تصميم الهياكل الاستنادية.



Code	Course Name	Credit Hours	Prerequisite
CVEE 311	Highway Design	3	CVEE 205

Design concepts, options for increased sustainability, integration issues, construction materials. Students will explore driver and vehicle characteristics, stopping and passing sight distances, cross section elements, vertical and horizontal alignment, intersections and interchanges, surface drainage, types of pavements, and principles, theoretical concepts and design of flexible and rigid pavements.

مفاهيم التصميم، خيارات لزيادة الاستدامة، قضايا التكامل، مواد البناء. سوف يستكشف الطلاب خصائص السائق والمركبة، ومسافات التوقف والعبور، وعناصر المقطع العرضي، والمحاذاة الرأسية والأفقية، والتقاطعات والتقاطعات، والصرف السطحي، وأنواع الأرصفة، والمبادئ، المفاهيم النظرية وتصميم الأرصفة المرنة والجامدة.

Code	Course Name	Credit Hours	Prerequisite
CVEE 312	Reinforced Concrete Design II	3	CVEE 306

Design of solid slabs (one-way and two-way solid slabs), Design of Hollow block slabs (one-way and two-way slabs), Design of paneled beam slabs, design of flat slabs, detailing of reinforcing steel. Design is according to Egyptian code.

تصميم البلاطات الصلبة (البلاطات الصلبة ذات الاتجاه الواحد والثنائي)، تصميم البلاطات المجوفة (البلاطات ذات الاتجاه الواحد والثنائي)، تصميم الألواح ذات الكمرات، تصميم الألواح المسطحة، تفصيل حديد التسليح. التصميم طبقاً للكود المصري.

Code	Course Name	Credit Hours	Prerequisite
CVEE 324	Construction Materials & Quality Control II	3	CVEE 201

Various types of advanced concrete, metals, and highway materials. Examples are concrete admixtures, special concretes, special construction alloys, soil stabilizers, and bituminous materials and high strength low alloy steels. Non-destructive tests on concrete structures, repair materials, engineering pipes, Bituminous mixes and asphalt work. Hardness of surfaces, impact loads and fatigue. Advanced mechanics of components incorporating innovative materials. Environmental-friendly use of materials and incorporation of waste materials. Advanced quality control techniques. Laboratory experiments are conducted for demonstration purposes.

أنواع مختلفة من الخرسانة والمعادن ومواد الطرق المتقدمة. ومن الأمثلة على ذلك الخلطات الخرسانية، والخرسانة الخاصة، وسبائك البناء الخاصة، ومثبتات التربة، والمواد البيتومينية، والفولاذ منخفض القوة ذو القوة العالية. الاختبارات غير الاتلافية على الهياكل الخرسانية ومواد الترميم والأنابيب الهندسية والخلطات البيتومينية والأعمال الإسفلتية. صلابة الأسطح وأحمال التأثير والتعب. ميكانيكا متقدمة للمكونات التي تتضمن مواد مبتكرة. الاستخدام الصديق للبيئة للمواد ودمج مواد النفايات. تقنيات مراقبة الجودة المتقدمة. يتم إجراء التجارب المعملية لأغراض العرض التوضيحي.

Code	Course Name	Credit Hours	Prerequisite
CVEE 328	Structural Analysis III	3	CVEE 302

Deflection (Virtual work- Double integration method) – Moment Distribution - Analysis of plane frames, grillages and space trusses using the stiffness method, degree of freedom and sign convention, element stiffness matrix in element local axes, transformation matrix for forces and displacements in global axes, Equilibrium equations in global axes, internal forces in members of structure, influence of temperature change and settlement of supports, effect of axial force on the stiffness of structures [P-delta effect], stability functions and equations of stability, buckling of trusses and frames, applications, structural dynamics, definitions, classification of structural systems, free vibration of SDOF systems, undamped vibration, damped vibration, forced vibration of SDOF systems, response to constant and harmonic forces, response to general type of forces (using Duhamel integration).

الانحراف (العمل الافتراضي – طريقة التكامل المزدوج) – توزيع العزم – تحليل الإطارات المستوية والشبكات والجمالونات الفضائية باستخدام طريقة الصلابة، درجة الحرية واتفاقية الإشارة، مصفوفة صلابة العنصر في المحاور المحلية للعنصر، مصفوفة التحويل للقوى والإزاحات في العالم المحاور، معادلات التوازن في المحاور العالمية، القوى الداخلية في أعضاء المنشأ، تأثير التغير في درجات الحرارة واستقرار الدعامات، تأثير القوة المحورية على صلابة المنشأ تأثير [P-delta]، وظائف الثبات ومعادلات الثبات، انبعاث



الجمالونات والأطر والتطبيقات والديناميكيات الهيكلية، تعريفات، تصنيف الأنظمة الهيكلية، الاهتزاز الحر لأنظمة SDOF، الاهتزاز غير المخمّد، الاهتزاز المخمّد، الاهتزاز القسري لأنظمة SDOF، الاستجابة للقوى الثابتة والتوافقية، الاستجابة للنوع العام من القوى (باستخدام تكامل دو هاميل).

Code	Course Name	Credit Hours	Prerequisite
CVEE 330	Advanced Steel Structure Analysis	3	CVEE 305

Structural system of bridges types of bridges: Structural systems in longitudinal and transverse directions, Material of construction, Design philosophy. Design loads: Road way loading, Railway loading, Other loads on bridges. Design of floor beams systems: Stringer, Cross girders, Floor connections. Design of plate girder bridges: General design considerations, Fatigue considerations, Buckling of plates, Actual strength of plate girder elements, Flange to web weld, Stiffeners, Splices, Curtailment of flange plates, Details. Design of truss bridges: General design considerations, Fatigue considerations, Actual strength of truss members. Design of joints, Details. Design details: Bracings, Bearings. Topics relevant to bridge design: Beam grids, Curved and skew bridges, Composite bridges, Deflection and camber, Temperature effect in bridges, Erection of bridges

النظام الإنشائي للجسور أنواع الجسور: الأنظمة الإنشائية في الاتجاهين الطولي والعرضي، مواد البناء، فلسفة التصميم. الأحمال التصميمية: أحمال الطرق، أحمال السكك الحديدية، الأحمال الأخرى على الجسور. تصميم عوارض الأرضيات الأنظمة: سترينجر، عوارض متقاطعة، توصيلات أرضية. تصميم جسور العوارض اللوحية: اعتبارات التصميم العامة، اعتبارات التعب، انبعاج الألواح، القوة الفعلية لعناصر العوارض اللوحية، شفة اللحام بالويب، أدوات التقوية، الوصلات، تقليم ألواح الفلنجة، التفاصيل. تصميم الجسور الجمالونية: اعتبارات التصميم العامة، اعتبارات التعب، القوة الفعلية لأعضاء الجمالون. تصميم المفاصل، التفاصيل. تفاصيل التصميم: المحامل، المحامل. إقامة الجسور.

Code	Course Name	Credit Hours	Prerequisite
CVEE 338	Engineering Surveying	3	CVEE 203

Role of surveying in engineering surveying projects, Total station instrument and its applications in setting out coordinates, Methods of setting out highways, Roads, Airports and runways and their correlated different types of curves, Tunnel survey, Setting out of water, Sewer and infrastructure networks, Setting out of construction 3D deformation mentoring. Introduction to geometric geodesy, Introduction to map projection, Introduction to grid coordinates and their transformation, Introduction to GPS basics of GPS, Methods of observing

دور المساحة في مشاريع المساحة الهندسية، جهاز التوتال ستيشن وتطبيقاته في تحديد الإحداثيات، طرق تحديد الطرق السريعة والطرق والمطارات والمدارج وأنواع المنحنيات المرتبطة بها، مسح الأنفاق بدء تشغيل شبكات المياه والصرف الصحي والبنية التحتية، وتوجيه التشوهات ثلاثية الأبعاد أثناء البناء. مقدمة في الجيوديسيا الهندسية، مقدمة في إسقاط الخرائط، مقدمة في إحداثيات الشبكة وتحويلها، مقدمة في أساسيات نظام تحديد المواقع GPS، طرق الرصد.

Code	Course Name	Credit Hours	Prerequisite
CVEE 339	Professional Training in Civil Engineering	3	60 Credit Hours

Each student is required to spend a minimum of eight weeks in industrial training. A complete account of the experience is reported, presented and evaluated. Professional ethics: theories and analysis of ethical case studies.

يتعين على كل طالب قضاء ثمانية أسابيع على الأقل في التدريب الصناعي. يتم الإبلاغ عن حساب كامل للتجربة وعرضها وتقييمها. الأخلاقيات المهنية: نظريات وتحليل دراسات الحالة الأخلاقية.

Code	Course Name	Credit Hours	Prerequisite
CVEE 401	Advanced Foundation Engineering	3	CVEE 310

Design of shallow foundations including footings and raftings; design of deep foundations including driven piles, shafts and drilled piers; pile load tests; end bearing and friction of deep foundations under axial loading; settlement of piles; bearing capacity and settlement of pile groups; piles subjected to lateral loading and moments; and design of pile

foundations. Introduces design of retaining walls. Braced cut excavations, sheet-pile walls and reinforced earth structures; off shoring; problematic soil and ground improvement; and the design of staged construction embankments.

تصميم الأساسات الضحلة بما في ذلك القواعد والعوارض الخشبية؛ تصميم الأساسات العميقة بما في ذلك الأكوام والأعمدة والأرصفة المحفورة؛ اختبارات تحميل كومة. تحمل النهاية والاحتكاك للأساسات العميقة تحت التحميل المحوري؛ تسوية أكوام. القدرة على التحمل وتسوية مجموعات كومة. أكوام تتعرض للتحميل الجانبي ولحظات. وتصميم الأساسات كومة. يقدم تصميم الجدران الاستنادية. الحفریات المقطوعة، والجدران ذات الأكوام والهياكل الأرضية المسلحة؛ خارج المساندة؛ إشكالية تحسين التربة والأرض. وتصميم السدود البناء على مراحل.

Code	Course Name	Credit Hours	Prerequisite
CVEE 402	Methods & Equipment for Construction 1	2	CVEE 306

Techniques of building construction and management; methods, materials, tools and equipment; traditional, mechanized and prefabrication construction systems. Construction detailing. Selection, sizing, matching and operation of construction equipment

تقنيات تشييد المباني وإدارتها؛ الأساليب والمواد والأدوات والمعدات؛ أنظمة البناء التقليدية والآلية والمسبقة الصنع. تفصيل البناء. اختيار وتحجيم ومطابقة وتشغيل معدات البناء.

Code	Course Name	Credit Hours	Prerequisite
CVEE 404	Computer Methods in Structural Analysis & Design	3	CVEE 301

The course explores structural systems; loading on structures (wind and earthquake loads), virtual work method, stiffness and flexibility methods; matrix formulation of the stiffness and flexibility methods, direct stiffness method, introduction to finite element method, computer analysis and design of 2D and 3D framed structures and high-rise buildings. Emphasizes team-based learning through specific design projects.

يستكشف المقرر الأنظمة الهيكلية. التحميل على الهياكل (أحمال الرياح والزلازل)، وطريقة العمل الافتراضية، وطرق الصلابة والمرونة؛ صياغة مصفوفة لطرق الصلابة والمرونة، طريقة الصلابة المباشرة، مقدمة لطريقة العناصر المحدودة، التحليل الحاسوبي وتصميم الهياكل ثنائية وثلاثية الأبعاد والمباني الشاهقة. يؤكد على التعلم القائم على الفريق من خلال مشاريع تصميم محددة.

Code	Course Name	Credit Hours	Prerequisite
CVEE 405	Design of Reinforced Concrete III	3	CVEE 312

The course introduces flooring and structural systems. Covers design of reinforced concrete members including beams subjected to torsion, column under biaxial bending, slender columns (Long columns). Design of Frames and stairs and saw tooth structures. Design of concrete Trusses. Emphasizes team-based learning through specific design projects. The design is according to Egyptian Code.

يقدم المقرر الأرضيات والأنظمة الهيكلية. يغطي تصميم العناصر الخرسانية المسلحة بما في ذلك الكمرات المعرضة للالتواء، والأعمدة تحت الانحناء ثنائي المحور، والأعمدة النحيلة (الأعمدة الطويلة). تصميم الإطارات والسلالم وهياكل مسننة. تصميم الجمالونات الخرسانية. يؤكد على التعلم القائم على الفريق من خلال مشاريع تصميم محددة. التصميم طبقاً للكود المصري.

Code	Course Name	Credit Hours	Prerequisite
CVEE 412	Design of Irrigation System	3	CVEE 307

Introduction to Irrigation and Drainage Engineering, Irrigation project planning and design, irrigation water requirements, soil-water interaction- water duties – when is irrigation needed, conveyance systems, traditional and modern irrigation systems (surface, Drip, sprinkle and trickle), drainage systems, irrigation and drainage structures. Irrigation systems and their areas in Egypt.

مقدمة في هندسة الري والصرف، تخطيط وتصميم مشاريع الري، متطلبات مياه الري، تفاعل مياه التربة، واجبات المياه، أنظمة النقل، أنظمة الري التقليدية والحديثة (السطح، بالتنقيط، الرش والتنقيط)، أنظمة الصرف الصحي، هياكل الري والصرف. أنظمة الري في مصر.



Code	Course Name	Credit Hours	Prerequisite
CVVE 415	Design of Reinforced Concrete IV	3	CVVE 405

Design of Shell structures (Domes, Cones, paneled shells, folded plates, verendil structures), design of Arches, Shear walls. Concrete water structures; design considerations and parameters, water tightness, construction of circular and rectangular tanks (rested on soil, elevated tanks, underground).

تصميم الهياكل القشرية (القباب، المخاريط، الأصداف المغطاة بألواح، الألواح المطوية، الهياكل الصدفية) تصميم الأقواس، حوائط القص. المنشآت الخرسانية المائتية: اعتبارات ومعايير التصميم، احكام تسريب المياه، إنشاء الخزانات الدائرية والمستطيلة (المرتكزة على الأرض، الخزانات المرتفعة، تحت الأرض).

Code	Course Name	Credit Hours	Prerequisite
CVVE 490	Senior Project I	1	Senior Standing

A capstone project: Topics are selected by groups of students according to their area of interest upon advisors' approval. Projects address solutions to open ended applications using an integrated engineering approach.

مشروع التخرج: يتم اختيار المواضيع من قبل مجموعات من الطلاب وفقاً لمجال اهتمامهم بناءً على موافقة المستشارين. تعالج المشاريع حلولاً للتطبيقات المفتوحة باستخدام نهج هندسي متكامل.

Code	Course Name	Credit Hours	Prerequisite
CVVE 491	Senior Project II	2	CVVE 490

An applied capstone project. Continuation of senior project I topics is encouraged. Actual construction projects are selected by groups of students upon advisors' approval for analysis. The management and technology aspects of construction are simulated and investigated.

مشروع التخرج التطبيقي. يتم تشجيع استمرار موضوعات المشروع الأول. يتم اختيار المشروع الفعلي في أحد التخصصات المدنية والإنشائية من قبل مجموعات من الطلاب بعد موافقة المستشارين للتحليل. تتم محاكاة الجانب الإداري والتكنولوجي للبناء والتحقق فيه.

Civil Engineering Elective Course Description

Code	Course Name	Credit Hours	Prerequisite
CVVE 336	Railway Engineering	3	-

Railway dynamics: Tractive effort and resistance, Acceleration and braking, Line capacity. Railway alignment: Longitudinal and cross sections, Railway path, Vertical and horizontal curve design, Gaparite, Cumulative curve. Structural design of track: Wheel - rail interaction, Forces acting on the rail, Joined and welded rail design, Sleeper and ballast design, Unballasted track and magnetic levitation train, Turnouts, Stations and signals, Renewal and maintenance.

ديناميكيات السكك الحديدية: جهد الجر والمقاومة، التسارع والكبح، سعة الخط. محاذاة السكك الحديدية: المقاطع الطولية والعرضية، مسار السكة الحديد، تصميم المنحنى الرأسي والأفقي، الجاباريت، المنحنى التراكمي. التصميم الإنشائي للسكة: تفاعل العجلة مع السكة، القوى المؤثرة على السكة، تصميم السكة المتصلة والملحومة، تصميم النائمة والصابورة، السكة غير الصابورة وقطار الرفع المغناطيسي، الإقبال، المحطات والإشارات، التجديد والصيانة.



Code	Course Name	Credit Hours	Prerequisite
CVEE 422	Earthquake Engineering	3	CVEE 328 , 330

Introduction, Causes and effects of earthquakes, Quantification and magnitude of earthquakes, Factors affecting structural seismic response, Earthquake design philosophy and limit states, Determination of earthquake forces by code provisions, Free vibration analysis of multi-degrees of freedom systems, Response spectrum analysis of multi-degrees of freedom systems, Design response spectrum curves, Applications

مقدمة، أسباب وآثار الزلازل، القياس الكمي وحجم الزلازل، العوامل المؤثرة على الاستجابة الزلزالية الهيكلية، فلسفة تصميم الزلازل والحالات الحدية، تحديد قوى الزلازل من خلال أحكام الكود، تحليل الاهتزاز الحر لأنظمة الحرية متعددة الدرجات، تحليل طيف الاستجابة أنظمة الحرية المتعددة الدرجات، تصميم منحنيات طيف الاستجابة، التطبيقات.

Code	Course Name	Credit Hours	Prerequisite
CVEE 489	Selected topics in Civil and Environmental Engineering	3	Senior Standing

Selected topics in Civil and Environmental Engineering will be selected from any discipline and presented.

The head of the program: Dr. Ashraf Abdel Khalek Mostafa **Signature:**

The Program Coordinator: Dr. Ashraf Abdel Khalek Mostafa **Signature:**



Appendices



Appendix (1)

Report of external evaluation

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Appendix (2)

Staff Members

The Staff Members as Instructors for The Courses of The Program according to the exact disciplines 2022/2023

No.	Member	Academic Degree	Exact Specialization	Title of PhD Thesis	Title of Master's Thesis
First: The Major Staff members responsible for the program					
1	Dr. Ashraf Abd El-Khalik Mostafa	Lecture	Analysis of installations / design of metal structures / fortified facilities	Retrofit of Fortified Structures to Resist Blast Effect	Effect of Rigid Frames or Bracing Systems on The Elastic Stability of Steel Structure
2	Dr. Tarek Salah	Lecture			
3	Dr. Sameh Samir	Lecture			
4	Dr. Amin Zinhom	Lecture			
Second: The staff members for teaching Architecture Engineering courses in the program					
5	Dr. Sherehan Adel Hegazi	Lecture	Architecture	"Management of urban sites and landscapes as an approach to the development of historic areas".	"Management of urban sites and landscapes as an approach to the development of historic areas".
Third: The staff members for teaching Basic Sciences courses in the Program					
6	Dr. Amara Marei	Lecture	Analytical Chemistry & humanize Skills	preparation and characterization of composite reverse osmosis membranes and its application for saline water desalination	chemical study on some reverse osmosis membranes for possible use in desalination of saline water
7	Dr. Doaa Fathy	Lecture	Physical Chemistry & Scientific research	Preparation of some polymeric membranes for water desalination	Modification of some polymeric natural materials using ionizing radiation and their possible applications
8	Dr. Abd El-Aziz Ramadan	Lecture	Engineering economy	The Development of A Structured Approach to The Design for Economic Manufacture of Engineering	
9	Dr. Eldosoky Eid	Professor			

The Seconded (part-time) Members as Instructors for The Courses of The Program according to the exact disciplines 2022/2023

No.	Member	Academic Degree	Exact Specialization	Title of PhD Thesis	Title of Master's Thesis
First: The members seconded for the Major Courses of the Program					
10	Ass. Prof. Hani Ibrahim	Assistant Professor	Material	Predicating The Chloride Ingress Process Inside Blended Concrete Using Artificial Neural Network	Performance of Egyptian Activated Slag in Severe Condition



11	Ass. Prof. Yahya Faried	Assistant Professor	Fiel Plane & Topographic survey	Designing GPS networks using artificial intelligence techniques	Accurate detection of small movements of the monitoring signal on satellites using digital meteorological processing methods
12	Dr. Ahmed Farag	Lecture	Soil Mechanics	Study of Ground Movement Adjacent to Deep Excavation	Study of The Performance of Deep Excavation Side Support
13	Dr. Mona Fawzi	Lecture	Steel	Moment Connection of Beams & Concrete-Filled Steel Columns	Torsional-Flexural Buckling Loads of Compressed Members with Unsymmetric Steel Section
14	Dr. Mohammed El-Daydamoni	Lecture	Structure	Experimental and Numerical Analysis of Composite Desk Slabs	Using Stabilized Soil Blocks in Low-Cost Housing
15	Dr. Mohammed Badawi	Lecture	Concrete	Resisting Punching Shear of Flat Slabs by Shear Heads	Cyclic Loading of Steel-Beam Joint strengthened by GFRP
16	Dr. Sameh Yehia	Lecture	structure	Flexural behavior of strengthened RC Beames using External post tensioning under cycle loads	Behaviors of RC columns reinforced with FRB Bars
17	Dr. Hala Hashem	Lecture	Highway design	Microbial rigid pavement	Warm mix asphalt pavement
18	Dr. Mohammed El-Feky	Lecture	Structure	Structure behavior of frames strengthened using pre-stressing methods	Enhancing seismic performance of bridge joints using energy dissipation devices
19	Dr. Naser Mohammed	Lecture	Transportation & traffic engineering - Railway engineering	Developing models to predict the characteristics of accidents and their impact on the national economy in Egypt	The relationship between traffic characteristics and road pavement condition in Egypt
20	Dr. Mohamed Hazem	Lecture	Water & wastewater Treatment Engineering	UPFLOW ANAEROBIC SLUDGE BLANKET (UASB) PERFORMANCE IMPROVEMENT USING PAKING MATERIAL	THE EFFECT OF CHANGING THE HYDRAULIC RETENTION TIME, THE SLUDGE AGE AND STARVATION PERIODS ON A UASB FOLLOWED BY CONTINUOUS SBR SYSTEM
Third: The members seconded for teaching Basic Sciences in the program					
21	Dr. Gamal El-Anani	Lecture	Functional analysis	Harmonic Analysis on Semigroups Without Neutral Element.	Pure Math
22	Dr. Ahmed El-Husani	Lecture	English	Grotesque and Carnival in the black comedy of Joe Orton and Lenen Al-Ramli	The American Nightmare in Selected Plays by Sam Shepard: A Psychoanalytical and Semiotic Study



Appendix (3)

NO	code	Courses learning strategie method	On line / face to face	Tutorials: sheets/	projects	Problem solving	Brain storming	Practical: lab	discovering	Site visit	Reports/ researches	Cooperative work	presentation	Discussion	modelling
			√	√											
1	BASE303	Engineering economics	√	√							√		√		
2	BASE307	Contracts, Bids & Liabilities	√	√							√		√		
3	BASE308	Seminar	√	√							√		√		
4	BASE309	Human Rights	√	√							√		√		
5	BASE401	Communication skills	√	√							√		√		
6	BASE404	Negotiation skills	√	√							√		√		
7	BASE306	Research methods	√	√							√		√		
8	BASE402	Feasibility studies	√	√							√		√		
9	MATH 101	Calculus 1	√	√		√	√							√	
10	MATH 102	Calculus 2	√	√		√	√							√	
11	MATH 201	Calculus 3	√	√		√	√							√	
12	MATH 202	Differential Equations	√	√		√	√							√	
13	MATH 301	Probability and statistics	√	√		√	√							√	
14	MATH 302	Linear Algebra and Matrices	√	√		√	√							√	



32	ENGR302	General Mechanics & Electrical Engineering												
33	CVVEE101	Environmental science & Technology	√	√							√		√	
34	CVVEE110	Civil Drawing		√	√	√	√	√			√	√		√
35	CVVEE201	Construction Materials & Quality Control	√	√		√	√							√
36	CVVEE202	Construction Materials Lab		√	√	√	√	√			√	√		√
37	CVVEE203	Field plane & Topographic Surveying	√	√		√	√							√
38	CVVEE204	Field plane Surveying							√	√	√		√	
39	CVVEE205	Transportation & Traffic Engineering	√	√		√	√							√
40	CVVEE206	Civil Engineering cost Analysis & Project	√			√		√	√	√	√	√	√	√
41	CVVEE211	Civil Drawing 2	√	√		√	√							√
42	CVVEE301	Structural Analysis 1	√	√		√	√							√
43	CVVEE302	Structural Analysis 2	√	√		√	√							√
44	CVVEE303	Geotechnical Engineering Structures	√	√		√	√							√
45	CVVEE304	Geotechnical Engineering Lab		√	√	√	√	√			√	√		√
46	CVVEE305	Steel Structural Design	√	√		√	√							√
47	CVVEE306	Reinforced Concrete	√	√		√	√							√



		Structural Design 1												
48	CVVEE307	Fundamentals of Hydraulic Engineering	√	√		√	√							√
49	CVVEE308	Environmental & Sanitary Engineering	√	√		√	√							√
50	CVVEE312	Reinforced Concrete Structural Design 2	√	√		√	√							√
51	CVVEE338	Engineering Surveying	√	√		√	√							√
52	CVVEE339	Professional Training in civil Engineering	√	√		√	√							√
53	CVVEE412	Design of Irrigation System	√	√		√	√							√
54	CVVEE490	Senior project 1	√			√		√	√	√	√	√	√	√
55	CVVEE491	Senior project 2	√			√		√	√	√	√	√	√	√
56	ARCH205	Building Construction	√	√		√	√							√
57	CVVEE310	Geotechnical Engineering Design	√	√		√	√							√
58	CVVEE311	Highway Design	√	√		√	√							√
59	CVVEE324	Construction Materials & Quality Control 2	√	√		√	√							√
60	CVVEE328	Structural Analysis 3	√	√		√	√							√
61	CVVEE330	Advanced steel Structural Analysis	√	√		√	√							√
62	CVVEE401	Advanced Foundation Engineering	√	√		√	√							√



63	CVVEE402	Methods & Equipment for Construction 1	√	√		√	√								√
64	CVVEE404	Computer Methods in Structural Analysis & Design		√	√	√	√	√			√	√			√
65	CVVEE405	Reinforced Concrete Structural Design 3	√	√		√	√								√
66	CVVEE415	Reinforced Concrete Structural Design 4	√	√		√	√								√
67	CVVEE336	Railway Engineering	√	√		√	√								√
68	CVVEE422	Earthquake Engineering	√	√		√	√								√
69	CVVEE489	Selected topics in Civil and Environmental Engineering	√	√							√		√		



Appendix (4)

The relation between Course and assessment methods of the program

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Appendix (5)

Course Specifications and Course Final Report

Part (1): Course Specifications

Part (2): Course Report Final

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