



Ministry of Higher Education Higher Institute of Engineering and Technology New Damietta

<u>Mathematics (1)</u> (MTH101)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mathematics (1)
Course Code	MTH101
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Teeshinghours	Lectures	Tutorial	Practical		
Teaching nours	2	2	-		

2. Course Aims

No.	Aims
1	Master a broad range of Mathematics engineering knowledge and specialized skills of Algebra and Calculus, as well as the ability to apply acquired knowledge of Algebra and Calculus in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve mathematical engineering problems of varying systems models.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve	al Explain the relevant mathematical engineering principles and
complex engineering problems	theories in Algebra and Calculus.
by applying engineering	a3 Explain the basic concepts of derivative and algebra.
fundamentals, basic science, and	b1 Use the mathematical engineering principles and theories
mathematics.	that apply in the most fundamental problems.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Vectors - Vectors Algebra- partial fractions	4	4	-
2	The Concept of functions	2	2	-
3	Equations theory –Mathematical Deduction	4	4	-
4	Basic Trigonometric functions and its inverse Exponential and Logarithmic functions Hyperbolic functions and its inverse Connection (definition – theories) Maclaurin expansion The Taylor series	4	4	-
5	Numerical solutions methods	4	4	-
6	Limits, derivatives, and curves drawing	4	4	-





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7	Introduction of Partial Derivatives	4	4	-
8	Linear equations systems – Gauss Jordan method for deletion.	2	2	-
	Total	28	28	-

Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
Vectors - Vectors Algebra- partial fractions	X	x			X	X	X							
The Concept of functions	X	X			X	X	X							
Equations theory – Mathematical Deduction	X	x			x	X	X							
Basic Trigonometric functions and its inverse Exponential and Logarithmic functions Hyperbolic functions and its inverse Connection (definition – theories) Maclaurin expansion The Taylor series	X	X			х	х	х							
Numerical solutions methods	X	X			X	X	X							
Limits, derivatives, and curves drawing	X	x			X	X	X							
Introduction of Partial Derivatives	х	x			х	X	X							
Linear equations systems – Gauss Jordan method for deletion.	х	x			x	x	х							







6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	a1, b1
2	Semester work (quizzes, sheets, report)	C1	b1
3	Final term examination	C1	a1, a3, b1
7.2 E	valuation Schedule:		

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	7^{th} - 9^{th}
3	Final term examination	15 th

7.3 weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Richard W. Fisher "No-Nonsense Algebra, 2nd Edition" Math Essentials; 2nd edition (2018).
2	Sherman K. Stein " Calculus in the First Three Dimensions" Dover Publications; Second Edition, (2018).

9. Facilities required for teaching and learning:

	Fa		
1	Lecture classroom	3	White board
2	Seminar	4	Data Show system

10. Matrix of Competencies and LO's:

No	Торіс	Aims	Competencies	LO's
1	Vectors - Vectors Algebra- partial fractions	1	C1	a1, b1
2	The Concept of functions	1	C1	a1, b1
3	Equations theory –Mathematical Deduction	1	C1	a1, b1
	Basic Trigonometric functions and its	1		
1	inverse		C1	a1 b1
-	Exponential and Logarithmic functions		CI	a1, 01
	Hyperbolic functions and its inverse			





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	Connection (definition – theories)			
	Maclaurin expansion			
	The Taylor series			
5	Numerical solutions methods	1	C1	a1, b1
6	Limits, derivatives and curves drawing	1	C1	a3, b1
7	Introduction of Partial Derivatives	1	C1	a3, b1
8	Linear equations systems – Gauss Jordan method for deletion.	1	C1	a1, b1

Course Coordinator: Dr. Reda Abdo **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022







<u>Mechanics (1)</u> (ENG101)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mechanics (1)
Course Code	ENG101
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing hours	Lectures	Tutorial	Practical		
reaching nours	2	2	-		

2. Course Aims:

No.	Aims
1	Master a broad range of statics knowledge to apply it on force system, distributed forces, and
1	moment of inertia.
	Use the techniques, skills, and current engineering tools required for engineering practice of
3	Statics applications by taking full responsibility for one's own learning and development,
	participating in lifelong learning and consider the impact of statics study in real world, and its
	strong relation with environment and almost of all the technology fields upgrades.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a1 Define concepts and theories of space vectors, momentums, equivalent couples, and equation of equilibrium for rigid body. a2 Recognize methodologies of solving equilibrium under the effect of forces. b1 Solve engineering problems, such as finding the center of mass (group of particles – flat surfaces).

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
	Introduction to statics.			
	Fundamental concept			
	Basic quantities of unit dimension- System of units Space,			
1	Trigonometry and U.S. Customary units, Force.	2	2	
	Statics of particles, Statics of Rigid Body, Free body			-
	diagrams.			
	Types of forces, Types of system of forces			
2	Statics of particles	2	2	-







	Forces on a particle, Addition of vectors, Resultant of			
	several concurrent forces.			
3	Resolution of a forces into components Rectangular components of a forces, (unit vectors). Addition of forces by summing X and Y components. Equilibrium of a particle, and Newton's first law of motion.	2	2	-
4	Problem involving the equilibrium of a practice- free body diagram. Rectangular components of a force in space, force defined by its magnitude and two points on its line of action. Addition of concurrent forces in space, equilibrium of a particle in space.	2	2	-
5	Rigid bodies: equivalent systems of forces. External and internal forces, principle of transmissibility and equivalent forces, vector product of two vectors, vector product expressed in terms of rectangular components	2	2	-
6	Moment of a force about a point. Varignon's theorem, rectangular components of the moment of a force, equivalent systems of forces.	4	4	-
7	Equilibrium of rigid bodies Free- body diagram. Equilibrium of a rigid body in two dimensions.	2	2	-
8	Equilibrium of three- dimension force body. Reduction of a system of forces to one force and one couple. Equilibrium of a rigid body in three dimensions. Reactions at supports and connections for a two- dimensional and for a three- dimensional structure.	4	4	-
9	Centroids and centers of gravity. Centre of gravity of a two- dimensional body, centroids of area and lines, first moments of areas and lines, composite plates and wires.	4	4	-
10	Analysis of structures Definition of truss Simple trusses Analysis of trusses by the method of joints	4	4	-
	Total	28	28	-



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Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
Introduction to statics. Fundamental concept Basic quantities of unit dimension- System of units Space, Trigonometry and U.S. Customary units, Force. Statics of particles, Statics of Rigid Body, Free body diagrams. Types of forces, Types of system of forces	X	X			X									
Statics of particles Forces on a particle, Addition of vectors, Resultant of several concurrent forces.	X	X				X								
Resolution of a forces into components Rectangular components of a forces, (unit vectors). Addition of forces by summing X and Y components. Equilibrium of a particle, and Newton's first law of motion.	X	X					X							
Problem involving the equilibrium of a practice- free body diagram. Rectangular components of a force in space, force defined	X	X			X									





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by its magnitude and									
two points on its line of									
action									
Addition of concurrent									
forces in space,									
equilibrium of a particle									
in space.									
Rigid bodies: equivalent									
systems of forces									
External and internal									
External and internal									
forces, principle of									
transmissibility and	v	v		v	v				
equivalent forces,	А	А		А	А				
vector product of two									
vectors vector product									
expressed in terms of									
expressed in terms of									
rectangular components						 	 	 	
Moment of a force									
about a point.									
Varignon's theorem,									
rectangular components	X	X		X					
of the moment of a									
force equivalent									
force, equivalent									
systems of forces.						 	 	 	
Equilibrium of rigid									
bodies									
Free- body diagram.	N7	N/		W					
	X	X		X					
Equilibrium of a rigid									
body in two dimensions									
Equilibrium of three									
Equilibrium of three-									
dimension force body.									
Reduction of a system									
of forces to one force									
and one couple.									
Equilibrium of a rigid									
body in three	v	v			v				
dimonsions	Α	А			Α				
Desetions of mental									
Reactions at supports									
and connections for a									
two- dimensional and									
for a three- dimensional									
structure.									
Centroids and centers of									
aravity									
Control of another of	Х	Х		Х	Х				
Centre of gravity of a									
two- dimensional body,									







centroids of area and lines, first moments of areas and lines, composite plates and wires.									
Analysis of structures Definition of truss Simple trusses Analysis of trusses by the method of join	X	X		X					

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	a1, b1
2	Semester work (quizzes, sheets, report)	C1	a1, b1
3	Final term examination	C1	a1, a2, b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks	
1	Midterm examination	$8^{ ext{th}}$	
2	Semester work	2^{nd} -7 th - 9 th -14 th	
3	Final term examination	15 th	

7.3 weighting of Evaluation:

No.	Evaluation Method	Weights	
1	Midterm examination	20%	
2	Semester work	20%	
3	Final term examination	60%	
	Total 100%		

8. List of References:

No.	Reference List
1	M. Abdullah Al Faruque, Bahar Zoghi, Sylvester A. Kalevela " Engineering statics" 1st edition, CRC Press (2019).
2	Bogachev, V., Smolyanov, Oleg G. "Topological Vector Spaces and Their Applications" Springer International Publishing (2017).





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9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Introduction to statics. Fundamental concept Basic quantities of unit dimension- System of units Space, Trigonometry and U.S. Customary units, Force. Statics of particles, Statics of Rigid Body, Free body diagrams. Types of forces, Types of system of forces	1	C1	al
2	Statics of particles Forces on a particle, Addition of vectors, Resultant of several concurrent forces.	1	C1	al
3	Resolution of a forces into components Rectangular components of a forces, (unit vectors). Addition of forces by summing X and Y components. Equilibrium of a particle, and Newton's first law of motion.	3	C1	a2
4	Problem involving the equilibrium of a practice- free body diagram. Rectangular components of a force in space, force defined by its magnitude and two points on its line of action. Addition of concurrent forces in space, equilibrium of a particle in space.	3	C1	a2
5	Rigid bodies: equivalent systems of forces. External and internal forces, principle of transmissibility and equivalent forces, vector product of two vectors, vector product expressed in terms of rectangular components	1	C1	al
6	Moment of a force about a point. Varignon's theorem, rectangular components of the moment of a force, equivalent systems of forces.	1	C1	al
7	Equilibrium of rigid bodies Free- body diagram. Equilibrium of a rigid body in two dimensions.	3	C1	a2
8	Equilibrium of three- dimension force body. Reduction of a system of forces to one force and one couple. Equilibrium of a rigid body in three dimensions. Reactions at supports and connections for a two- dimensional and for a three- dimensional structure. Centroids and centers of gravity.	3	C1 C1	a1, a2 b1





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	Centre of gravity of a two- dimensional body, centroids of area and lines, first moments of areas and lines, composite plates and wires.			
10	Analysis of structures Definition of truss Simple trusses Analysis of trusses by the method of joints	3	C1	b1

Course Coordinator: Dr. Moataz Mostafa **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022



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<u>Physics (1)</u> (PHY101)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Physics (1)
Course Code	PHY101
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing haung	Lectures	Tutorial	Practical
reaching nours	2	2	2

2. Course Aims:

No.	Aims
1	Mastery of a broad range of engineering physics knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories in critical and systemic analytical thinking to identify, diagnose, and solve engineering problems of varying complexity and variance
4	Use the experimental techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development, participating in lifelong learning, and demonstrating the ability to pursue postgraduate and research studies.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a1 Explain concepts and theories of mathematics for physical quantities, unit's dimensional analysis and basics of thermodynamics. a2 Recognize methodologies of solving problems for stress-strain diagram, and fluids study. b1 Select the appropriate solutions for properties of materials through Brittle and Ductile material.
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.	a2 Describe quality assurance systems, codes of practice and standards, health and safety requirements, and environmental issues.
C6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	c1 Conduct troubleshooting in chemical engineering plants.





4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Physics and Measurement Practical: measurement methods	4	4	2
2	Mechanical properties for materials Practical: Hooks' Law	4	4	2
3	Oscillations Practical: simple pendulum.	4	4	2
4	Sounds. Practical: Resonance in the Air columns.	2	2	4
5	Fluids. Practical: Viscosity.	4	4	4
6	Heat transfer Practical: Heat& Specific Heat& thermo-electrical equivalent& the latent heat of melting ice.	2	2	6
7	The kinetic theory of gases and the work in thermodynamics Practical: melting point of solid materials.	2	2	4
8	The laws of thermodynamic Practical: heating and cooling curves.	4	4	2
9	Temperature and thermal expansion Practical: coefficient of linear thermal expansion.	2	2	2
	Total	28	28	28

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	PhysicsandMeasurementPractical:measurementmethods	X	X				X								X
2	Mechanical properties for materials Practical: Hooks' Law	X	X			X									X





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	Γ		1	r	1				r	r	1	r	1	
3	Oscillations Practical: simple pendulum.	X	x					X						X
4	Sounds. Practical: Resonance in the Air columns.	X	x				x							X
5	Fluids. Practical: Viscosity.	X	x					x						X
6	Heat transfer Practical: Heat& Specific Heat& thermo-electrical equivalent& the latent heat of melting ice.	X	x			x								X
7	The kinetic theory of gases and the work in thermodynamics Practical: melting point of solid materials.	X	x											X
8	The laws of thermodynamic Practical: heating and cooling curves.	X	X				x							X
9	Temperature and thermal expansion Practical: coefficient of linear thermal expansion.	X	x					X						X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason		
1	Presentation of the course in digital material	Better access any time		
2	Web communication with students	Better communication with certain cases		
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different levels of students		

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1, C2, C6	a1, a2, c1
2	Semester work (quizzes, sheets, report)	C1, C2, C6	al
3	Practical exam	C1	a1, a2





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4	Final term examination	C1, C6	a2, c1				
7.2 E	7.2 Evaluation Schedule:						
No.	Evaluation Method		Weeks				
1	Midterm examination		8 th				
2	Semester work		$7^{\text{th}},9^{\text{th}}$				
3	Practical examination		14 th				
4	Final term examination		15 th				
7.3 w	eighting of Evaluation:						
No.	Evaluation method		Weights				
1	Mid-term examination		10%				
2	final examination		60%				
3	Practical examination		10%				
4	Semester work		20%				
	Total		100%				

8. List of References:

No.	Reference List
1	Peter J. Williams; Firas Mansour; Robert L. Hawkes; (Nuclear physicist) Javed Iqbal; Marina
	Milner-Bolotin. Physics for scientists and engineers: an interactive approach, Nelson
	Education Ltd., Year: 2019
n	David Halliday, Robert Resnick, Jearl Walker. Fundamentals of Physics, 9th Edition, Binder
2	Ready Version, 2019
2	Serway, Raymond A., and John W. Jewett. Physics for scientists and engineers. Cengage
3	learning, 2018.
4	Hibbeler, Russell C. "Mechanics of materials." (2018).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Laboratory
3	Presenter
4	White board
5	Data show system





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No.	Торіс	Aims	Competencies	LO's
1	Physics and Measurement Practical: measurement methods	1,4	C1, C2, C6	a1, a2, c1
2	Mechanical properties for materials Practical: Hooks' Law	1,4	C1, C2, C6	a1, a2, c1
3	Oscillations Practical: simple pendulum.	1,4	C1, C2, C6	a1, a2, c1
4	Sounds. Practical: Resonance in the Air columns.	1,4	C1, C2, C6	a1, a2, c1
5	Fluids. Practical: Viscosity.	1,4	C1, C2, C6	a1, a2, c1
6	Heat transfer Practical: Heat& Specific Heat& thermo- electrical equivalent& the latent heat of melting ice.	1,4	C1, C2, C6	a1, a2, c1
7	The kinetic theory of gases and the work in thermodynamics Practical: melting point of solid materials.	1,4	C1, C2, C6	a1, a2, c1
8	The laws of thermodynamic Practical: heating and cooling curves.	1,4	C1, C2, C6	a1, a2, c1
9	Temperature and thermal expansion Practical: coefficient of linear thermal expansion.	1,4	C1, C2, C6	a1, a2, c1

Course Coordinator: Assoc. Prof. Dr. Amal Bahiry & Dr. Ahmed Lotfy **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>General Chemistry</u> (CHE101)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	General Chemistry
Course Code	CHE101
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing haung	Lectures	Tutorial	Practical
reaching nours	2	-	2

2. Course Aims:

No.	Aims					
1	Master a wide spectrum of engineering knowledge and specialized skills for applying acquired					
I	knowledge using theories and abstract thinking in real life situations.					
0	Consider the impact of chemical process industries on society, economics, and the					
ð	environment using fundamental knowledge of chemical process industries.					

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals and basic science.	 a1 Describe the relevant Chemical principles and theories in the discipline. c2 Identify the chemical engineering principles and theories that apply to the topic. c3 Solve chemical engineering problems by applying chemical engineering fundamentals.
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.	a2 Describe quality assurance systems, codes of practice and standards, health and safety requirements, and environmental issues.
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.	 d1 Collaborate effectively within multidisciplinary team. d2 Work in stressful environment and within constraints.







C6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	c1 Conduct troubleshooting in chemical engineering plants.
C10 Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	d2 Acquire chemical engineering principles for professionally merge, understanding, and feedback to improve design, products for many chemical engineering industries.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Gaseous status. Practical: Chemistry Laboratory Equipment, Titrimetric Analysis.	4	-	4
2	Chemical thermodynamics. Practical: Preparation of standard solution of Na ₂ CO ₃ (0.1N), Determination of normality of HCL by using standard solution of oxalic acid.	4	-	4
3	Properties of solutions. Practical: Determination of normality of acetic acid by using standard solution of sodium hydroxide, Determination of normality of sodium carbonate by using standard solution of HCL.	4	-	4
4	Material balance in combustion processes. Practical: Standardization of potassium permanganate with oxalic acid.	2	-	2
5	Dynamic balance in physical and chemical operations. Practical: Determination of nitrites, precipitation titrations.	4	-	4
6	Kinetic chemical interactions. Practical: Preparation of 0.05N of sodium chloride.	2	-	2
7	Electrochemistry, corrosion, and corrosion control. Practical: Determination of chloride ion by using Mohr method.	2	-	2
8	Fertilizers. Practical: Determining Molecule Weight by Freezing Point Depression Method.	2	-	2
9	Manufacturing and chemistry of Cement. Practical: Determining Molecule Weight by Freezing Point Depression Method.	2	-	2
10	Water processes. Practical: determination of water hardness by complex metric titration.	2	-	2
	Total	28	-	28



No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
1	Gaseous status. Practical: Chemistry Laboratory Equipment, Titrimetric Analysis.	x	x			x									x
2	Chemical thermodynamics. Practical: Preparation of standard solution of Na ₂ CO ₃ (0.1N), Determination of normality of HCL by using standard solution of oxalic acid.	x	x				X								x
3	Properties of solutions. Practical: Determination of normality of acetic acid by using standard solution of sodium hydroxide, Determination of normality of sodium carbonate by using standard solution of HCL.	x	x					x							X
4	Material balance in combustion processes	x	x				X								x





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	Practical: Standardization of potassium permanganate with oxalic acid.									
5	Dynamic balance in physical and chemical operations. Practical: Determination of nitrites, precipitation titrations.	X	x		X					X
6	Kinetic chemical interactions. Practical: Preparation of 0.05N of sodium chloride.	x	x		X					X
7	Electrochemistry, corrosion, and corrosion control. Practical: Determination of chloride ion by using Mohr method.	x	x			X				X
8	Fertilizers. Practical: Determining Molecule Weight by Freezing Point Depression Method.	x	x			X				X
9	Manufacturing and chemistry of Cement. Practical: Determining Molecule Weight by Freezing Point Depression Method.	X	X		X					X
10	Water processes. Practical: determination of water hardness by	x	x		X					X





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complex	metric							
titration.								

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	a1, c3, a2, c1	
2	Semester work (quizzes, sheets, report)	C1, C3, C2, C6	c2, c3, d2, a2, c1
3	Practical Examination	C1, C10, C3, C2, C	c6 c2, c3, d2, a2, c1
4	Final term examination	C1, C10	a1, c2, c3, a2, c1
7.2 Ev	valuation Schedule:		
No.	Evaluation Method		Weeks
1	Midterm examination		8 th
2	Semester work		2^{nd} - 7^{th} - 9^{th}
3	Practical Examination		14 th
4	Final term examination		15 th
7.3 w	eighting of Evaluation:		
No.	Evaluation Method		Weights
1	Midterm examination		10%
2	Semester work		20%
3	Practical Examination		10%
4	Final term examination		60%
	Total		100%

8. List of References:

No.	Reference List					
1	Theodore L. Brown, et al, Chemistry the Central Science, Prentice Hall Int. (Pearson International 14 edition), 2017.					
2	Peter Atkins, Julio de Paula, James Keeler "Atkins' Physical Chemistry 11ed" Oxford University Press; 11th edition (2018)					

9. Facilities required for teaching and learning:

No.	Facility	No.	Facility
1	Lecture classroom	4	Data show system
2	Presenter	5	Sound system
3	White board	6	Laboratory





<u>10. Matrix of Competencies and LO's:</u>

No.	Торіс	Aims	Competencies	LO's
1	Gaseous status. Practical: Chemistry Laboratory Equipment, Titrimetric Analysis.	1	C1, C3, C2, C6	a1, a2, c1
2	Chemical thermodynamics. Practical: Preparation of standard solution of Na ₂ CO ₃ (0.1N), Determination of normality of HCL by using standard solution of oxalic acid.	1	C1, C3, C2, C6, C3, C2, C6	a1, a2, c1
3	Properties of solutions. Practical: Determination of normality of acetic acid by using standard solution of sodium hydroxide, Determination of normality of sodium carbonate by using standard solution of HCL.	1	C1, C3, C2, C6	a1, a2, c1
4	Material balance in combustion processes. Practical: Standardization of potassium permanganate with oxalic acid.	1	C1, C3, C2, C6	a1, c3, a2, c1
5	Dynamic balance in physical and chemical operations. Practical: Determination of nitrites, precipitation titrations.	1	C1, C3, C2, C6	a1, c3, a2, c1
6	Kinetic chemical interactions. Practical: Preparation of 0.05N of sodium chloride.	1	C1, C3, C2, C6	a2, c1, a1
7	Electrochemistry, corrosion, and corrosion control. Practical: Determination of chloride ion by using Mohr method.	1, 8	C3, C2, C6, C10	a2, c1, a1, c2, c3, d2
8	Fertilizers. Practical: Determining Molecule Weight by Freezing Point Depression Method.	8	C3, C2, C6, C10	a2, c1, c2, d2
9	Manufacturing and chemistry of Cement. Practical: Determining Molecule Weight by Freezing Point Depression Method.	8	C3, C2, C6, C10	a2, c1, c2, d2
10	Water processes. Practical: determination of water hardness by complex metric titration.	8	C10	c2, d2

Course Coordinator: Prof. Dr. Khaled Samir & Dr. Sohir Abo Baker **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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Engineering Drawing and Projection (ENG103)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Engineering Drawing and Projection
Course Code	ENG103
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing hours	Lectures	Tutorial	Practical		
reaching nours	1	-	4		

2. Course Aims:

No.	Aims
1	Master a broad range of engineering drawing knowledge and specialized skills, as well as the
	ability to apply acquired knowledge in real-world situations.
	Work in and manage a diverse team of professionals from various engineering disciplines,
2	taking responsibility for own and team performance; and behave professionally and adhere to
	engineering ethics and standards.
	Use the techniques, skills, and current engineering tools required for engineering practice by
4	taking full responsibility for one's own learning and development, participating in lifelong
	learning, and demonstrating the ability to pursue postgraduate and research studies.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a1 Explain the basic principles of engineering drawing. a2 Explain the scientific principles and theories that apply to the topic. b1 Using scientific concepts and tools that are relevant to the profession. b2 Applying engineering drawing basics that are relevant to the subject.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Techniques and skills of engineering drawing	1	-	4
2	Engineering operations	1	-	4
3	Orthogonal projection – Secondary orthogonal	2	-	8
4	Intersections	1	-	4
5	projections of simple bodies	1	-	4
6	rules of writing dimensions	1	-	4





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7	Deduction of missing projections	1	-	4
8	Drawing of engineering sections.	1	-	4
9	Steel frames	2	-	8
10	Introduction to AutoCAD Fundamentals of engineering drafting by way of computer aided drawing (CAD) software. Basic features and capabilities of CAD software and drafting fundamentals including orthographic projection, and isometric pictorials, part dimensioning in 2 dimensional drawings.	3	-	12
	Total	14		56

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Techniques and skills of engineering drawing	x					x								
2	Engineering operations	X				x	X								
3	Orthogonal projection – Secondary orthogonal	X				x	X								
4	Intersections	X				X	X								
5	Projections of simple bodies	X				X	X								
6	Rules of writing dimensions	x				x	x								
7	Deduction of missing projections	x				x	x								
8	Drawing of engineering sections.	x				X	x								
9	Steel frames	X				X	X								
10	Introduction to AutoCAD Fundamentals of	X					X								X





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engineering						
drafting by way of						
computer aided						
drawing (CAD)						
software Basic						
features and						
capabilities of CAD						
software and						
drafting						
fundamentals						
including						
orthographic						
projection, and						
isometric pictorials.						
part dimonsioning						
part differisioning						
in 2 dimensional						
drawings.						

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
r	Asking small groups to do assignments each composed	Knowledge and skills transfer
2	of low, medium, and high-performance students.	among different level of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm exam	C1	a1, a2, b1
2	Semester work (quizzes, sheets, report)	C1	a1, a2
3	Final exam	C1	b1, b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work	2^{nd} - 7^{th} - 9^{th}
2	Mid Term exam	8 th
3	Practical examination	14 th
4	Final term exam	15 th

7.3 weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	10%
2	Practical examination	10%
3	Semester work	20%
4	Final-term examination	60%
	Total	100%





8. List of References:

No.	Reference List					
1	K. V. NATARAJAN "ENGINEERING GRAPHICS Paperback" DHANALAKSHMI					
1	PUBLISHERS (2018)					
2	Lakhwinder Pal Singh, Harwinder Singh "Engineering Drawing: Principles and Applications"					
	Cambridge University Press; First edition (2019)					

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Computer lab
3	Seminar
4	White board
5	Data Show system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Techniques and skills of engineering drawing	1	C1	al
2	Engineering operations	1, 4	C1	a2
3	Orthogonal projection – Secondary orthogonal	1, 4	C1	al
4	Intersections	1	C1	al
5	Projections of simple bodies	1	C1	a2
6	Rules of writing dimensions	1, 2	C1	b1
7	Deduction of missing projections	1	C1	b1
8	Drawing of engineering sections.	1	C1	b2
9	Steel frames	1	C1	b2
10	Introduction to AutoCAD Fundamentals of engineering drafting by way of computer aided drawing (CAD) software. Basic features and capabilities of CAD software and drafting fundamentals including orthographic projection, and isometric pictorials, part dimensioning in 2 dimensional drawings.	1,4	C1	b1, b2

Course Coordinator: Dr. Moataz Mostafa **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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Introductions to Computer Systems (ENG104)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and EngineeringDepartment
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Introductions to Computer Systems
Course Code	ENG104
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing haung	Lectures	Tutorial	Practical		
reaching nours	1	-	2		

2. Course Aims:

No.	Aims
1	Master a wide range of engineering knowledge and specialized skills, as well as the ability to
1	apply that information in real-world situations using theories and analytical thinking.
7	Use techniques, skills and modern engineering tools necessary for engineering practice;

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	c2 Identify the concepts and theories of science necessary for engineering systems.c3 Applying engineering basics that are relevant to the subject.
C5 Practice research techniques and methods	b1 Assess different ideas, views, and knowledge
of investigation as an inherent part of learning.	from a range of sources.

4. Course Contents:

No.	Topics	Lecture	Practical	Tutorial
	Computer architecture.			
1	practical: Visual Studio C# Interface	1	2	-
	Writing simple statements			
2	Computer systems	2	1	_
2	Practical: Variables, Data type	2	-	-
3	Files systems	1	2	
5	Practical: Input & Output	1	2	-
Λ	Computer networks	2	4	
-	Practical: Conditional Statements	2	4	-
5	Internet networks	2	4	
5	Practical: Arrays	Δ.	4	-
6	Data systems and information technology	2	4	-





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	Practical: Loop Statement (For, while & do -while)			
7	Computer graphics – Multimedia systems Practical: Loop Statement (For, while & do -while)	1	2	-
8	Methods of solving problems and logical design for the programs and matrices. Practical: Nested loop	2	4	-
9	Engineering applications in programming using one structured programming language. Practical: Engineering Case Study.	1	2	-
	Total	14	28	-

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and	Cooperative	Discovering	Modeling	lab
1	Computer architecture. practical: Visual Studio C# Interface Writing simple statements	x	x	x											X
2	Computer systems Practical: Variables, Data type	x	x			x									X
3	Files systems Practical: Input & Output	x	x			x									X
4	Computer networks Practical: Conditional Statements	x		X											X
5	Internet networks Practical: Arrays	x	x												X
6	Data systems and information technology Practical: Loop Statement (For, while & do -while)	x	x												X
7	Computer graphics Multimedia systems	x	x			x									X





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	Practical: Loop Statement (For, while do -while)								
8	Methods of solving problems and logical design for the programs and matrices. Practical: Nested loop	X	X		X				X
9	Engineering applications in programming using one structured programming language. Practical: Engineering Case Study.	X	X						X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	c2, c3
2	Semester work (quizzes, sheets, report)	C5	b1, c3
3	Practical Examination	C1, C5	c2, c3
4	Final term examination	C1, C5	c3, b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	2 nd ,7 th ,9 th ,13 th
3	Practical Examination	14 th
4	Final term examination	15 th

7.3 weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	10%
2	final examination	60%
3	Practical examination	10%
4	Semester work	20%
	Total	100%





8. List of References:

No.	Reference List
1	Darrell Hajek, Cesar Herrera "Introduction to Computers" CreateSpace Independent Publishing Platform (May 8, 2018).
2	Ludwik Czaja "Introduction to Distributed Computer systems: Principles and features" Springer; 1st ed. 2018.

9. Facilities required for teaching and learning:

No.	Facility								
1	Lecture classroom	4	White board						
2	Computer lab	5	Data show system						
3	Presenter	6	Wireless internet						
7	Sound system								

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Computer architecture. practical: Visual Studio C# Interface Writing simple statements	1	C1	c2
2	Computer systems Practical: Variables, Data type	1	C1	c2
3	Files systems Practical: Input & Output	1	C1	c3
4	Computer networks Practical: Conditional Statements	1	C1	c3
5	Internet networks Practical: Arrays	1	C1	c3
6	Data systems and information technology Practical: Loop Statement (For, while & do -while)	1,7	C1	c3
7	Computer graphics – Multimedia systems Practical: Loop Statement (For, while & do -while)	1,7	C1	c3
8	Methods of solving problems and logical design for the programs and matrices. Practical: Nested loop	7	C5	b1
9	Engineering applications in programming using one structured programming language. Practical: Engineering Case Study.	7	C5	b1

Course Coordinator: Dr. Amira El Sonbaty **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>Mathematics (2)</u> (MTH102)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mathematics (2)
Course Code	MTH102
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Teaching hours	Lectures	Tutorial	Practical		
Teaching nours	2	2	-		

2. Course Aims:

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate,	a1 Explain the relevant mathematical engineering principles and theories
and solve complex	in the Analytical geometry and Integration.
engineering problems by	a3 Explain the basic concepts of Analytical geometry and Integration.
applying engineering	b1 Use the mathematical engineering principles and theories that apply
fundamentals, basic	in the most fundamental problems.
science, and	b3 Use the basics of integration and Geometry that are applicable to the
mathematics.	field.

4. Course Contents:

No.	Торіс	Lecture	Tutorial	Practical
	Basic concepts- equations of second degree and double			
1	equation for two straight lines	4	4	-
	Movement and rotation of axes			
2	Circle- conical sectors	6	6	-
	Analytical geometry in space			
3	Cartesian coordinates	2	2	-
	Cylindrical-spherical -plane in space			







4	Equations of surfaces in second order – rotation and movement of axes in space.	2	2	-
5	Indefinite integration (basic functions – theories) – method of integration	6	6	-
6	Definite integration (definition – properties -theories) Applications of definite integration (plain areas – circular volumes – plain technical length)	4	4	-
7	Areas – Circular surfaces	2	2	-
8	Numerical integration.	2	2	-
	Total	28	28	_

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Basic concepts- equations of second degree and double equation for two straight lines Movement and rotation of axes	x	x			x									
2	Circle– conical sectors	x	x				X								
3	Analytical geometry in space Cartesian coordinates Cylindrical- spherical -plane in space	x	x					X							
4	Equations of surfaces in second order – rotation and movement of axes in space.	X	X			X		X							
5	Indefinite integration (basic functions –	x	x			X	X								





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	theories) – method of integration										
6	Definite integration (definition – properties -theories) Applications of definite integration (plain areas – circular volumes – plain technical length)	X	x		X						
7	Areas – Circular surfaces	X				X	X				
8	Numerical integration.	X	X		X						

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason		
1	Presentation of the course in digital material	Better access any time		
2	Web communication with students	Better communication with certain cases		
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students		

7. Student Evaluation:

7.1 Student Evaluation method

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	a1, a3
2	Semester work (quizzes, sheets, report)	C1	b1, b3
3	Final term examination	C1	a1, a3, b1, b3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks			
1	Midterm examination	8 th			
2	Semester work	7 th - 9 th			
3	Final term examination	15 th			

7.3 weighting of Evaluation:No.Evaluation MethodWeights1Midterm examination20%2Semester work20%3Final term examination60%Total100%





8. List of References:

No.	Reference List
1	P.N.Chatterjee "Analytical Geometry Paperback"Anu Books (2019)
2	Gerardus Blokdyk "System Integration A Complete Guide" 5STARCooks (2019).
3	Chris McMullen "Essential Calculus Skills Practice Workbook with Full Solutions" Zishka Publishing (2018).

9. Facilities required for teaching and learning:

	Facility						
1	Lecture classroom	3	White board				
2	Seminar	4	Data Show system				

10. Matrix of Competencies and LO's:

No	Торіс	Aims	Competencies	LO's
1	Position, Displacement, Velocity, and Acceleration of	1	C1	01 02
1	Particle	1	CI	a1, a5
2	Plane Motion path of Particle	1	C1	a1, a3
3	Description of plane Motion using Cartesian axes	1	C1	a1, a3
4	Projectiles	1	C1	a1, a3
5	Relative motion between particles	1	C1	a1, a3
6	Motion for particle in circular path	1	C1	a1, a3
7	Newton's second law of motion	1	C1	b1, b3
8	Principle of work and energy of motion	1	C1	b1, b3
9	Principle of conservation of mechanical energy	1	C1	b1, b3
10	Principle of impulse and momentum of rigid body	1	C1	b1, b3

Course Coordinator: Dr. Reda Abdo

Head of Department: Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022







<u>Mechanics (2)</u> (ENG102)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mechanics (2)
Course Code	ENG102
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing hours	Lectures	Tutorial	Practical	
Teaching nours	2	2	-	

2. Course Aims:

No.	Aims
1	Master a broad range of Mechanics knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.

3. Competencies:

Competencies	Learning Outcomes (LO'S)				
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a1 Define position, velocity and acceleration of particles and principles of conversation of mechanical energy. a2 Recognize methodologies of solving engineering problems including principles of work and energy. b1 Solve engineering problems to determine the velocity and position of projectile. c1 Apply knowledge of principle of work and principle of work and energy of motion and principle of conservation of mechanical energy and momentum of rigid body. 				

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Position, Displacement, Velocity, and Acceleration of particle		4	-
2	Plane Motion Path of Particle	2	2	-
3	Description of plane motion using Cartesian axes	2	2	-
4	Projectiles	2	2	-
5	Relative motion between particles	2	2	-
6	Motion for particle in circular path	2	2	-
7	Newton's second law of motion	4	4	-





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8	Principle of work and energy of motion	4	4	-
9	Principle of conservation of mechanical energy	2	2	-
10	Principle of Impulse and Momentum of rigid body	4	4	-
	Total	28	28	-

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Position, Displacement, Velocity, and Acceleration of Particle	x	X			x									
2	Plane Motion path of Particle	x	X			X									
3	Description of plane Motion using Cartesian axes	x	X	x											
4	Projectiles	X	Χ					X							
5	Relative motion between particles	x	X			X									
6	Motion for particle in circular path	x	X			X									
7	Newton's second law of motion	x	X				X								
8	Principle of work and energy of motion	X	x	x											
9	Principle of conservation of mechanical energy	x	x			X									
10	Principle of impulse and momentum of rigid body	X	x				X								






6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	a1, a2, b1
2	Semester work (quizzes, sheets, report)	C1	b1, c1
3	Final term examination	C1	a1, a2, b1, c1
7.2 Evaluation Schedule:			

No.	Evaluation Method	Weeks		
1	Midterm examination	8 th		
2	Semester work	2^{nd} - 7^{th} - 9^{th} - 14^{th}		
3	Final term examination	15 th		

7.3 weighting of Evaluation:

No.	Evaluation Method	Weights	
1	Midterm examination	20%	
2	Semester work	20%	
3	Final term examination	60%	
	Total 100%		

8. List of References:

No.	Reference List
1	Marcelo R. M. Crespo da Silva "Fundamentals of Dynamics and Analysis of Motion" 2nd
1	edition, Dover Publications; (2019).
C	C. Hibbeler, Russell "Engineering Mechanics: Dynamics in SI Units, Global Edition" 14th
Z	edition, P&C ECS; 15th edition 2018).

9. Facilities required for teaching and learning:

Facility					
1	Lecture classroom	3	White board		
2	Seminar	4	Data Show system		

10. Matrix of Competencies and LO's:

No	Торіс	Aims	Competencies	LO's
1	Position, Displacement, Velocity, and Acceleration of	1	C1	o1
1	Particle	1	CI	al
2	Plane Motion path of Particle		C1	a1
3	Description of plane Motion using Cartesian axes		C1	a2
4	Projectiles		C1	b1
5	Relative motion between particles	1	C1	b1





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6	Motion for particle in circular path	1	C1	a2
7	Newton's second law of motion	1	C1	b1
8	Principle of work and energy of motion	1	C1	a2
9	Principle of conservation of mechanical energy	1	C1	al
10	Principle of impulse and momentum of rigid body	1	C1	c1

Course Coordinator: Dr. Moataz Mostafa **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022



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<u>Physics (2)</u> (PHY102)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Physics (2)
Course Code	PHY102
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Tasahing hours	Lectures	Tutorial	Practical
reaching nours	2	2	2

2. Course Aims:

No.	Aims
1	Master a broad range of engineering physics knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a1 Define concepts and theories of physics necessary for engineering system analysis. a2 Study solving engineering problems including Einstein's quantum hypothesis, laws of reflection and refraction, interference, and diffraction. a3 Define measurement devices in electrical conductivity, basic characteristics, and properties. b2 Select the appropriate solutions for engineering problems including Newton's Rings and design of optical fibers.
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.	a2 Describe quality assurance systems, codes of practice and standards, health and safety requirements, and environmental issues.
C6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	c1 Conduct troubleshooting in chemical engineering plants.





4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Basic of electricity. Practical: measurement devices in electrical conductivity.	2	2	4
2	Column's law and Gauss's law. Practical: sensitivity of galvanometer.	4	4	2
3	capacitors and capacitance. Practical: capacitors and capacitance	2	2	2
4	Currents and Resistance. Practical: ohm's law - series connection & parallel connection& resistance color code& meter bridge - voltmeter resistance.	4	4	10
5	Magnetic field and magnetic force. Practical: the inverse square law in magnetism.	4	4	2
6	The nature and propagation of light. Practical: the glass prism.	4	4	2
7	Optical fiber. Practical: the glass prism.	2	2	2
8	Introduction to Quantum theory.	2	2	0
9	Laser. Practical:	2	2	0
10	Lenses and mirrors. Practical: spherometer- mirrors and lenses.	2	2	4
	Total	28	28	28

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Basic of electricity. Practical: measurement devices in electrical conductivity.	X	X			Х									X
2	Column's law and Gauss's law.	X	X				X								X





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				1	 1	1			1	1		
	Practical: sensitivity of galvanometer.											
3	capacitors and capacitance. Practical: capacitors and capacitance	X	X				X					X
4	CurrentsandResistance.Practical:ohm'slaw-seriesconnection¶llelconnection&resistancecolorcode& meterbridge-voltmeterresistance.	X	X		X	X						X
5	Magnetic field and magnetic force. Practical: the inverse square law in magnetism.	X	X		X							X
6	The nature and propagation of light. Practical: the glass prism.	X	X			X						X
7	Optical fiber. Practical: the glass prism.	x	X				X					X
8	Introduction to Quantum theory.	x	x			X						X
9	Laser. Practical:	X	X				X					X
10	Lenses and mirrors. Practical: spherometer- mirrors and lenses.	X	X			X						X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases







3	Asking small groups to do assignments, each composed of low, medium, and high-	Knowledge and skills transfer among
	performance students.	different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1, C2, C6	a1, a3, a2, c1
2	Semester work (quizzes, sheets, report)	C1, C2, C6	a1, a3
3	Final term examination	C1	a1, a2, b2
4	Practical exam	C1 C6	a2 b2 c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	5^{th} , 7^{th} , 14^{th}
3	Final term examination	15 th

7.3 weighting of Evaluation: **Evaluation Method** Weights No. 10% 1 Mid-term examination 2 final examination 60% 10% 3 Practical examination 4 Semester work 20% Total 100%

8. List of References:

No.	Reference List
1	Shankar, Ramamurti. Fundamentals of Physics II. Yale University Press, 2021.
	Peter J. Williams; Firas Mansour; Robert L. Hawkes; (Nuclear physicist) Javed Iqbal; Marina
2	Milner-Bolotin. Physics for scientists and engineers: an interactive approach, Nelson
	Education Ltd., Year: 2019
2	David Halliday, Robert Resnick, Jearl Walker. Fundamentals of Physics, 9th Edition, Binder
3	Ready Version, 2019
4	Serway, Raymond A., and John W. Jewett. Physics for scientists and engineers. Cengage
4	learning, 2018.

9. Facilities required for teaching and learning:

No.	Fa	cility		
1	Lecture classroom			
2	Laboratory			
3	Presenter			
4	White board			
5	Data show system			
10. M	atrix of Competencies and LO's:			
No.	Торіс	Aims	Competencies	LO's
1	Basic of electricity.	1	C1. C2	a1. a3





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	Practical: measurement devices in electrical			
	conductivity.			
2	Column's law and Gauss's law.	1	C1 $C2$ $C6$	a1 a2 c1
2	Practical: sensitivity of galvanometer.	1	01, 02, 00	d1, d2, 01
3	capacitors and capacitance.	1	C1 C2 C6	al a2 cl
5	Practical: capacitors and capacitance	1	01, 02, 00	a1, a2, 01
	Currents and Resistance.			
1	Practical: ohm's law - series connection	1	C1 $C2$ $C6$	a1 a3 a2 c1
т	∥ connection& resistance color	1	C1, C2, C0	a1, a3 a2, c1
	code& meter bridge - voltmeter resistance.			
	Magnetic field and magnetic force.			
5	Practical: the inverse square law in	1	C1, C2, C6	a1, a2, c1
	magnetism.			
6	The nature and propagation of light.	1	C1 $C2$ $C6$	a? c1
0	Practical: the glass prism.	1	01, 02, 00	a2, 01
7	Optical fiber.	1	C1 $C2$ $C6$	$b^{2} a^{2} c^{1}$
/	Practical: the glass prism.	1	C1, C2, C0	02, a2, c1
8	Introduction to Quantum theory.	1	C1, C2, C6	a2, c1
0	Laser.	1	C1 $C2$ $C6$	h2 a2 a1
9	Practical:	1	C1, C2, C0	02, a2, c1
10	Lenses and mirrors.	1	C1 $C2$ $C6$	
10	Practical: spherometer- mirrors and lenses.	1	C1, C2, C6	az, oz az, ci

Course Coordinator: Assoc. Prof. Dr. Amal Bahiry & Dr. Ahmed Lotfy **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





Ministry of Higher Education Higher Institute of Engineering and Technology New Damietta

Production Engineering (ENG105)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Production Engineering
Course Code	ENG105
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing haung	Lectures	Tutorial	Practical	
Teaching nours	3	-	2	

2. Course Aims:

No.	Aims
1	Master a broad range of production engineering knowledge and specialized skills, as well as
1	the ability to apply acquired knowledge in real-world situations.
	Work in and manage a diverse team of professionals from various engineering disciplines,
2	taking responsibility for own and team performance; and behave professionally and adhere to
	engineering ethics and standards.
	Use the techniques, skills, and current engineering tools required for engineering practice by
3	taking full responsibility for one's own learning and development, participating in lifelong
	learning, and demonstrating the ability to pursue postgraduate and research studies.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	 a1 Explain the basic principles of production engineering. a3 List the characteristics of engineering materials related to production engineering. b3 Evaluate the characteristics and performance of engineering materials related to production engineering
C3 Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, and environmental.	 c1 Apply engineering knowledge to improve products of modern tools, systems, and procedure, to make the engineering process more balanced costs, benefits, safety, quality and reliability and environmental impact. c2 Apply safe systems including the use laboratory and field equipment competently
C6 Plan, supervise and monitor of production process, taking into consideration other trades requirements.	a1 Show the conventional procedures and characterization of common engineering materials and components.c2 Acquire production skills.





4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	The engineering substances and its properties Practical: engineering materials	3	-	2
2	Heating and cooling diagrams Practical: iron and steel production	3		2
3	Heating equilibrium diagrams Practical: heat treatment	3	-	2
4	Alloys - Casting operation (sand casting and the preparation of the mold) Practical: metal casting & mold for a sand casting& carpenter workshop	6	-	4
5	Forming processes (cold and hot forming: forging rolling – Wire drawing – Blanking and piercing - Deep drawing – The extrusion) Practical: metal forming	6		4
6	Processes of metal connections (the riveting – welding with its types sticking) Practical: metal joining process	6		2
7	Cutting machining: Lathing - Shaping – Drilling –Milling - Grinding – Work Piece fixation - Cutting tools fixation - Specifications of the operating machine) Practical: carpenter workshop	6	-	2
8	Methods of solving problems Practical: metal machining	3	-	2
9	Measuring tools (venire caliper – micrometers and its types) Practical: measurement tools	3	-	4
10	Production cycle production efficiency - Industrial safety Practical training in the different workshops	3	-	4
	Total	42	-	28

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
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1	The engineering substances and its properties Practical: engineering materials	x	x		x					X
2	Heating and cooling diagrams Practical: iron and steel production	x	x							X
3	Heating equilibrium diagrams Practical: heat treatment	X	X	x						X
4	Alloys - Casting operation (sand casting and the preparation of the mold) Practical: metal casting & mold for a sand casting& carpenter workshop	X								X
5	Forming processes (cold and hot forming: forging rolling – Wire drawing – Blanking and piercing - Deep drawing – The extrusion) Practical: metal forming	X	X							X
6	Processes of metal connections (the riveting – welding with its types sticking) Practical: metal joining process	X	x							X
7	Cutting machining: Lathing - Shaping – Drilling –Milling - Grinding – Work Piece fixation - Cutting tools	x	x							X





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	1		r	1			r	r	r		 	
	fixation -											
	Specifications of											
	the operating											
	machine)											
	Drastical: corrector											
	workshop											
	Methods of solving											
8	problems	v	v		v	v						v
0	Practical: metal	Λ	Λ		Λ	А						А
	machining											
	Measuring tools											
	(venire caliner –											
	micrometers and its											
9	true and the	X	X									X
	types)											
	Practical:											
	measurement tools											
	Production cycle											
	production											
1.0	efficiency -											
10	Industrial safety	x	x		x							X
	Practical training in				4							*
	the different											
	uie aiiierent											
	workshops											

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments, each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	a1, a3, b3
2	Semester work (quizzes, sheets report),	C3	c1, c2
3	Practical Exam	C3	c1, c2
4	Final term examination	C1	a1, b3, a3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Practical examination	8 th
2	Periodic exam	$7^{\text{th}}, 9^{\text{th}}, 14^{\text{th}}$
3	Final term examination	15 th





7.3 weighting of Evaluation:

No.	Evaluation Method	Weights
1	final examination	60%
2	Practical examination	8%
3	Periodic exam	32%
	Total	100%

8. List of References:

No.	Reference List
1	Shanker, Kripa, Shankar, Ravi, Sindhwani, Rahu "Advances in Industrial and Production Engineering" 1st edition, Springer Nature Singapore Pte Ltd. (2018).
2	Jeff Hansen "Manufacturing and Production Engineering: Planning and Control" Willford Press (2018).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Production engineering workshops
2	Presenter
3	White board
4	Data show system
5	Sound system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	The engineering substances and its properties Practical: engineering materials	1	C1	a1, a3
2	Heating and cooling diagrams Practical: iron and steel production	1	C1	a3
3	Heating equilibrium diagrams Practical: heat treatment	1	C1	b3
4	Alloys - Casting operation (sand casting and the preparation of the mold) Practical: metal casting & mold for a sand casting& carpenter workshop	1, 3	C3	c1, c2
5	Forming processes (cold and hot forming: forging rolling – Wire drawing – Blanking and piercing - Deep drawing - The extrusion) Practical: metal forming	1, 2	C3	c1, c2
6	Processes of metal connections (the riveting – welding with its types sticking) Practical: metal joining process	1, 3	C3	c1, c2
7	Cutting machining: Lathing - Shaping – Drilling – Milling - Grinding – Work Piece fixation - Cutting tools fixation - Specifications of the operating machine) Practical: carpenter workshop	1, 2, 3	C6	a1, c2





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No.	Торіс	Aims	Competencies	LO's
8	Methods of solving problems Practical: metal machining	1, 3	C1	b3
9	Measuring tools (venire caliper – micrometers and its types) Practical: measurement tools	1, 3	C3	c1
10	Production cycle production efficiency - Industrial safety Practical training in the different workshops	1, 3	C6	c2

Course Coordinator: Dr. Moataz Mostafa **Head of Department:** Assoc. Prof. Dr. Amal Bahiry

Date of Approval: 2022





Ministry of Higher Education Higher Institute of Engineering and Technology New Damietta

Introduction to Engineering and Environment (ENG106)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Introduction to Engineering and Environment
Course Code	ENG106
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing hours	Lectures	Tutorial	Practical
reaching nours	2	-	-

2. Course Aims:

No.	Aims
	Recognize his or her role in promoting engineering and contributing to the profession's and
3	community's development; by appreciating the importance of the environment, both physical
	and natural, and working to promote sustainability concepts

3. Competencies:

Competencies	Learning Outcomes (LO'S)
	a2 Explain the scientific principles and theories that apply to
C1 Identify formulate and solve	the topic.
ci identify, formulate, and solve	a3 Explain the basic principles of engineering.
complex engineering problems by	b2 Use scientific concepts and theories that are relevant to
applying engineering fundamentals,	the profession.
basic science, and mathematics.	c3 Solve complex engineering problems by applying
	engineering fundamentals.
C3 Apply engineering design	a2 Understand the professional ethics and impacts of
processes to produce cost-effective	engineering solutions on society and environment.
solutions that meet specified needs	a3 Recognizes the environmental and economic impact of
with consideration for global,	various industries, waste minimization, and industrial
cultural, social, economic,	facility remediation.
environmental, ethical, and other	b1 Judge engineering decisions considering balanced costs,
aspects as appropriate to the	benefits, safety, quality, reliability, and environmental
discipline and within the principles	impact.
and contexts of sustainable design	c1 Incorporate economic, societal, global, environmental,
and development.	and risk management factors into design.





4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Engineering concepts: What is engineering – international classification for the engineering jobs – Relation between engineering development and environment economic and social development – Engineering branches – Ethics of the engineering jobs.	10	-	-
2	Introduction to environmental science: the importance of studying environmental science	2	-	-
3	Modern technology and its effect on the environment – Quality of the environment and development elements	4	-	-
4	Sources of environmental pollution and method of control (air pollution – water pollution – solid wastes pollution – economics of environmental pollution control – legislations for the environment protection.	12	-	-
	Total	28	-	_

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Engineering concepts: What is engineering – international classification for the engineering jobs – relation between engineering development and environment economic and social development – engineering branches – ethics of the engineering jobs.	X	X								Х				





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2	Introductiontoenvironmentalscience:theimportanceofstudyingenvironmentalscience	x	X					X		
3	Modern technology and its effect on the environment – quality of the environment and development elements	x	x	X				X		
4	Sources of environmental pollution and method of control (air pollution – water pollution – solid wastes pollution –noise) – economics of environmental pollution control – legislations for the environment protection.	X	x	X				х		

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason				
1	Presentation of the course in digital material.	Better access any time.				
2	Asking small groups to do assignments; each composed	Knowledge and skills transfer				
2	of low, medium, and high-performance students.	among different levels of students.				

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid Term Examination	C1, C3	a2, a3, b1, b2
2	Semester work (quizzes, sheets, report)	C3	c1, c3
3	Final Term Examination	C1, C3	b1, b2, c3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work (Sheets, Quiz and Reports)	2 nd , 7 th , 9 th
2	Mid Term Examination	8 th
3	Final Term Examination	15 th





7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	د. جمال صالح السلامة من الكوارث الطبيعية والمخاطر البشرية، دار الشروق، 2019
2	Raju, Fundamental of air pollution, Oxford & IBH, 2019.

9. Facilities required for teaching and learning:

No.	Facility
1	Seminar
2	Lecture Classroom
3	White Board
4	Data Show system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Engineering concepts: What is engineering – international classification for the engineering jobs – relation between engineering development and environment economic and social development – engineering branches – ethics of the engineering jobs.	3	C3	a2, a3
2	Introduction to environmental science: the importance of studying environmental science	3	C1	a2, b2
3	Modern technology and its effect on the environment – quality of the environment and development elements	3	C3	b1, c1
4	Sources of environmental pollution and method of control (air pollution – water pollution – solid wastes pollution –noise) – economics of environmental pollution control – legislations for the environment protection.	3	C1	b2, c3

Course Coordinator: Prof. Dr. Osami Rageh & Assoc. Prof. Dr. Ramadan Elkateb **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





Ministry of Higher Education Higher Institute of Engineering and Technology New Damietta

<u>Technical English Language (1)</u> (LNG101)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Technical English Language (1)
Course Code	LNG101
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing hours	Lectures	Tutorial	Practical			
Teaching nours	1	-	2			

2. Course Aims:

No.	Aims
	Communicate effectively with a variety of audiences using a variety of forms, methods, and
5	languages; cope with academic and professional issues in a critical and creative manner; and
	display leadership, business administration, and entrepreneurial abilities.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C8 Communicate effectively graphically, verbally and in writing with a range of audiences using contemporary tools.	d1 Communicate effectively with a range of audiences using contemporary tools.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Engineering Lab.: skills in English Lesson 1 Bob's Day at work & Lesson 2 Bob returns home with bad news	3	-	6
2	A private flat Lab.: skills in English Lesson 3 Ted's Day at school	1	-	2
3	Bookshelves Lab.: skills in English Lesson 4 Nicole's day at school	1	-	2
4	Bridges Lab.: skills in English Lesson 5 Ted goes out for the evening. Grammar Topics	2	-	4
5	Reinforced concrete	2	-	4







	Laberstrille in English			
	Lao.: skills in English			
	Lesson 6 Susan stays home and bake cookies & Lesson			
	7 Susan hires Bob to run her own business			
	Surveying			
6	Lab.: skills in English	2	-	4
0	Lesson 8 Ted forms a rock band & Lesson 9 Nicole for	2		4
	president			
	Hydraulic works			
7	Lab.: skills in English	2	-	4
	Lesson 10 Bob visits the village market			
	Soil mechanics and foundations			
8	Lab.: skills in English	1	-	2
	Grammar topics			
	Total	14	-	28

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Engineering Lab.: skills in English Lesson 1 Bob's Day at work & Lesson 2 Bob returns home with bad news	X	X		X										X
2	A private flat Lab.: skills in English Lesson 3 Ted's Day at school	X	X												X
3	Bookshelves Lab.: skills in English Lesson 4 Nicole's day at school	X	X												X





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			1			1	1	1		
4	Bridges Lab.: skills in English									
	Lesson 5 Ted goes	X	X	X						X
	out for the evening.									
	Grammar Topics									
	Reinforced									
	concrete									
	Lab.: skills in									
	English									
5	Lesson 6 Susan	x	x	x						x
-	stays home and									
	bake cookies &									
	Lesson / Susan									
	own business									
	Surveying									
	Lab.: skills in									
	English									
6	Lesson 8 Ted forms	X	x							X
	a rock band &									
	Lesson 9 Nicole for									
	president									
	Hydraulic works									
	Lab.: skills in									
7	English	x	x							X
	Lesson 10 Bob									
	visits the village									
	Soil machanias and									
	foundations									
8	Lah · skills in	v	v							X
	English	А	А							4 h
	Grammar topics									

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different level of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C8	d1
2	Semester work (quizzes, sheets, report)	C8	d1





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3	Practical exam	C8	d1		
4	Final term examination	C8	d1		
7.2 Ev	aluation Schedule:				
No.	No. Evaluation Method Weeks				
1	Midterm examination		8 th		
2	Semester work		7 th ,9 th		
3	3 Practical examination		14^{th}		
4 Final term examination			15 th		
7.3 we	ighting of Evaluation:				
No.	No.Evaluation MethodWeights				
1	Mid-term examination		10%		
2	Practical examination		10%		
3	Semester work	20%			
4	4 Final-term examination 60%				
	Total 100%				

8. List of References:

No.	Reference List
1	David Bonamy "Technical English" Longman Publishing Group 2018
2	Paul J. Hamel "English for Better Jobs 1: Language for Working and Living" Create Space
2	Independent Publishing Platform; 1st edition (2019)
n	Mahmood Reza Atai, Alireza Zaré Alanagh, Morteza Nasiri and Reza Taherkhani "English
3	for The Students of Engineering" 1st edition, SAMT Publication (2021).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Computer lab.
3	Seminar
4	White board
5	Data Show system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Engineering Lab.: skills in English Lesson 1 Bob's Day at work & Lesson 2 Bob returns home with bad news	5	C8	d1
2	A private flat Lab.: skills in English Lesson 3 Ted's Day at school	5	C8	d1
3	Bookshelves Lab.: skills in English Lesson 4 Nicole's day at school	5	C8	d1
4	Bridges Lab.: skills in English	5	C8	d 1





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No.	Торіс	Aims	Competencies	LO's
	Lesson 5 Ted goes out for the evening.			
	Grammar Topics			
	Reinforced concrete			
5	Lab.: skills in English	5	C8	41
5	Lesson 6 Susan stays home and bake cookies & Lesson 7 Susan	5	Co	uı
	hires Bob to run her own business			
	Surveying			
6	Lab.: skills in English	5	C8	41
0	Lesson 8 Ted forms a rock band & Lesson 9 Nicole for	5	Co	uı
	president			
	Hydraulic works			
7	Lab.: skills in English	5	C8	d1
	Lesson 10 Bob visits the village market			
8	Soil mechanics and foundations			
	Lab.: skills in English	5	C8	d1
	Grammar topics			

Course Coordinator: Dr. Doaa Elshrbiny **Head of Department:** Assoc. Prof. Dr. Amal Bahiry

Date of Approval: 2022





Ministry of Higher Education Higher Institute of Engineering and Technology New Damietta

<u>Mathematics (3)</u> (MTH201)

1. Basic Information:

Program Title	All Programs		
Department Offering the Program	Basic Science and Engineering Department		
Department Responsible for the Course	Basic Science and Engineering Department		
Course Title	Mathematics (3)		
Course Code	MTH 201		
Year/Level	Level 2		
Specialization	Major – Compulsory Course		
Authorization Date of Course Specification	-		
Pre- request	MTH101		

Teaching hours	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims
1	Master a broad range of fundamental Mathematical engineering knowledge and solve of ordinary differential equations and partial differentiation applications, as well as the ability to apply acquired knowledge of ordinary differential equations and partial differentiation applications in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve multi-integrations of mathematical engineering.

3. Competencies:

Competencies	Learning Outcomes (LO'S)			
	al Understand the relevant engineering mathematical of ordinary			
C1 Identify, formulate,	differential equations and applications of Partial differentiation			
and solve complex	equations.			
engineering problems by	a2 Describe the effect of mathematical engineering principles and			
applying engineering	theories that apply in the most fundamental problems.			
fundamentals, basic	a3 Define the basic concepts of ordinary differential equations and			
science, and	Partial differentiation equations.			
mathematics.	b1 Applying the basics of ordinary differential equations and			
applications of Partial differentiation equations in engineering problem				

4. Course Contents:

No.	Торіс		Tutorial	Practical
	Functions of several variables			
1	Limits of functions of several variables.	2	4	-
	Continuity in multivariable functions			
n	Partial derivatives of higher order extreme for functions of	4	4	
	two variables	4	4	-
3	Double integral	10	4	-





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	Triple integral			
	Line integral in space, green's theorem			
	Surface integral			
	Gauss and stokes's theory			
	Basic concepts Formation of the differential equations		2	-
	Separable differential equations		4	-
1	Homogenous differential equations	4	2	-
4	Exact differential equation	4		
	linear differential equation		4	-
	Bernoulli's equation the linear differential operator			
	Second order homogeneous differential equations with			
5	constant coefficients	4	2	-
	Non-homogeneous linear differential equations			
	Convergence of la-place transform			
6	Important properties of la-place transform	4	2	
0	Laplace transforms of derivatives.	4	Z	-
	Inverse la-place transform			
	Total	28	28	-

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Functions of several variables Limits of functions of several variables. Continuity in multivariable functions	x	x			X	X								
2	Partial derivatives of higher order extreme for functions of two variables	x	X			X		X							
3	Double integral Triple integral	X	X			X	X								





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	1				1			1			-
	Line integral in										
	space, green's										
	theorem										
	Surface integral										
	Gauss and stokes's										
	theory										
	Basic concepts										
	Formation of the										
	differential										
	equations										
	Separable										
	differential										
	equations										
	Homogenous										
4	differential	X	X		Χ		Χ				
	equations										
	Exact differential										
	equation										
	linear differential										
	equation										
	Bernoulli's										
	equation the linear										
	differential operator										
	Second order										
	homogeneous										
	differential										
	equations with										
5	constant	X	X		Χ	Χ					
	coefficients										
	Non-homogeneous										
	linear differential										
	equations										
	Convergence of la-										
	place transform										
	Important										
	properties of la-										
6	place transform	x	X		Χ		х				
	Laplace transforms										
	of derivatives.										
	Inverse la-place										
	transform										

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases







100%

3	Asking small groups to do assignments; each composed of low, medium and high-performance students	Knowledge and skills transfer among different levels of students
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7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	a1, a2
2	Semester work (quizzes, sheets, report)	C1	a2, a3
3	Final term examination	C1	a1, a2, a3, b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	2^{nd} - 7^{th} - 14^{th}
3	Final term examination	15 th

7.3 weighting of Evaluation:No.Evaluation MethodWeights1Midterm examination20%2Semester work20%3Final term examination60%

Total

8. List of References:

No.	Reference List
1	Harumi Hattori "Partial Differential Equations: Methods, Applications and Theories" WSPC;
	2nd edition (2019).
2	Schaeffer, David, Cain, John Wesley "Ordinary Differential Equations: Basics and Beyond"
	2nd edition, Springer-Verlag New York (2020).
3	Yuefan Deng "Lectures, Problems and Solutions for Ordinary Differential Equations" 2nd
	edition, WSPC; Second Edition (2017).

9. Facilities required for teaching and learning:

	Facility						
1	Lecture classroom	3	White board				
2	Seminar	4	Data Show system				

10. Matrix of Competencies and LO's methods:

No.	Торіс	Aims	Competencies	LO's
	Functions of several variables			
1	Limits of functions of several variables.	1	C1	a1, a2
	Continuity in multivariable functions			
2	Partial derivatives of higher order	1	C1	a1 a2
2	extreme for functions of two variables	1	CI	a1, a2
	Double integral			
3	Triple integral	1	C1	a2
	Line integral in space, green's theorem			





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	Surface integral			
	Gauss and stokes's theory			
	Basic concepts Formation of the differential equations			
	Separable differential equations			
4	Homogenous differential equations	1	C1	a1 a3
	Exact differential equation	1	01	u1, u5
	linear differential equation			
	Bernoulli's equation the linear differential operator			
	Second order homogeneous differential equations with			
5	constant coefficients	1	C1	a3
	Non-homogeneous linear differential equations			
	Convergence of la-place transform			
6	Important properties of la-place transform	1	C1	b 1
6	Laplace transforms of derivatives.	1	CI	01
	Inverse la-place transform			

Course Coordinator: Dr. Reda Abdo **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>Civil Engineering Drawing</u> (CIE201)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Civil Engineering Drawing
Course Code	CIE201
Year/Level	Level 2
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG105

Taaahing haung	Lectures	Tutorial	Practical
reaching nours	1	4	-

2. Course Aims

No.	Aims
4	Use the techniques, skills, and current engineering tools required for engineering drawing
4	practice for irrigation works structures, reinforced concrete structure, and steel structures.
10	Select appropriate and sustainable technologies for drawing the irrigation works structures,
10	reinforced concrete structure, and steel structures such as AUTOCAD program.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. C11 Select appropriate and	 a2 Define the principles, (general concepts- legends and symbols – scales and drawing size – general layout and views. a3 Define the principal types of irrigation works (bridges, culverts, syphons) – reinforcement details – steel sections.
sustainable technologies for drawing structures; using computer programs (AUTO CAD program).	c1 Using either numerical technique (AUTO CAD program)
C12 Achieve an optimum details of	b1 Achieve the optimum planning and drawing main views,
drawing irrigation works,	and the detail of irrigation works structures (bridges,
sections	concrete structure and steel structures sections.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Introduction to civil engineering projects drawings (general concepts- legends and symbols – scales and drawing size – general layout and views – longitudinal and cross sections – detailing – drawings include steel structural cross-	8	32	-





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	sections and details, irrigation works structures (culverts, bridges, and syphons), reinforcement details, reinforced concrete structures views and reinforcement details.			
2	AutoCAD fundamentals of civil engineering drafting by way of computer aided drawing (CAD) software.	4	16	-
3	Basic features and capabilities of CAD software.	2	8	-
	Total	14	56	-

5. Teaching and learning methods:

Solution to	Face to face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
civil engineering projects (general concepts-legends and symbols – scales and drawing size – general layout and views – longitudinal and cross sections – detailing – drawings include structural steel sections and details, culverts roof and floor views, reinforcement details, housing details.	х	X			x	x								







AutoCAD fundamentals of civil engineering drafting by way of computer aided drawing (CAD) software	X	x		X	X				
Basic features and capabilities of CAD software.	x	x		x	x				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	Better access any time

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid term examination	C1	a2, a3
1	Mid-term examination	C12	b1
		C1	a2, a3
2	Semester work	C12	b1
		C11	c1
4		C1	a2, a3
	Final term examination	C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks		
1	semester work	$2^{nd}, 7^{th}, 9^{th}$		
2	Mid Term examination	8 th		
3	Final term examination	15 th		
7.3 Weighting of Evaluation:				

1.5 11	.5 Weighting of Evaluation.				
No.	Evaluation Method	Weights			
1	Mid-term examination	20%			
2	Semester work	20%			
3	Final-term examination	60%			
	Total	100%			

8. List of References:

No.	Reference List
1	Waller, Peter, Yitayew, Muluneh. (2016) Irrigation and Drainage Engineering. Available from your library or springer.com/shop.





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2	Bedient, P.B., and Huber, W.C., (1988). "Hydrology and floodplain Analysis". Addison-Wesley Publishing Company.p.650.
3	Deming, D., (2002)."Introduction to Hydrogeology". McGraw-Hill, New York.
4	Han, D., (2010). "Concise Hydrology". Download free Textbook at bookboon.com. P.145.

9. Facilities required for teaching and learning:

Facility							
1	Lecture classroom	3	White board				
2	Seminar	4	Data show system				

10. Matrix of knowledge and LO'S skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction to civil engineering projects (general concepts- legends and symbols – scales and drawing size – general layout and views – longitudinal and cross sections – detailing – drawings include structural steel sections and details, culverts roof and floor views, reinforcement details, housing details.	4	C1 C12	a2, a3 b1
2	Estimating of water requirements AutoCAD fundamentals of civil engineering drafting by way of computer aided drawing (CAD) software.	10	C11	C1
3	Basic features and capabilities of CAD software.	10	C11	C1

Course Coordinator Assoc. Prof. Dr. Mohamed Gabr **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022







<u>Structures Analysis (1)</u> (CIE202)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Structures Analysis (1)
Course Code	CIE202
Year/Level	Level 2
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG101

Teaching hours	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims
1	Applying theories and abstract thinking in analytic critical and systemic thinking to solve engineering problems of varying complexity and variation.
10	Select appropriate and sustainable technologies for construction of buildings

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a3 Explain the basic principles of engineering for structural analysis. b3 Applying engineering basics that are relevant to the structural analysis. c3 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals.
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.	 a1 Define, basic characteristics, properties, concepts, and techniques of structural analysis and mechanics. c3 Applying statistical analyses and objective engineering judgment to draw conclusions.
C11 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.	 a1 Recognize the fundamentals of structural analysis and mechanics. c1 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.





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4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Basic concept in structural analyses	2	2	-
2	Loads and reactions	4	4	-
3	Statically determinate beams	4	4	-
4	Statically determinate rigid frames	4	4	-
5	Statically determinate arches	4	4	-
6	Statically determinate trusses.	6	6	-
7	Influence lines for Statically determinate structures	4	4	_
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
Basic concept in structural analyses	X	x			X	X								
Loads and reactions	X	x			X	X								
Statically determinate beams	X	X			X	X								
Statically determinate rigid frames	X	x			X	X								
Statically determinate arches	X	x			X	X								
Statically determinate trusses.	X	x			X	X								
Influence lines for Statically determinate structures	X	x			X	X								

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time





2	Asking small groups to do assignments each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different level of students.
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7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's						
1	Midtorm avamination	C1	a3, c3						
1		C11	c1						
2	Semester work (quizzes, sheets, report)	C2	a1, a3						
		C11	a1, c1						
		C1	a3, b3, c3						
3	Final term examination	C2	a1, a3						
		C11	a1, c1						

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks		
1	Midterm examination	8 th		
2	Semester work	$2^{nd}, 7^{th}, 9^{th}$		
3	Final term examination	15 th		

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights			
1	Midterm examination	20%			
2	Semester work	20%			
3	Final term examination	60%			
	Total 100%				

8. List of References:

No.	Reference List
1	Essential books (textbooks)
	• W. M. El-dakhakhni, "Theory of Structures", Part One, Assiut University, 2016.
	• W. M. El-dakhakhni, "Theory of Structures", Part Two, Assiut University, 2016.
	• El-Sayed El-Kasaby and Fayez Kaiser, "Theory of Structures-Solved examples", Part 1,
	2018.
2	Recommended books
	• Structural Analysis, R. C. Hibbeler, 2020.
	• Structural Analysis 1: Statically Determinate Structures, S. Khalfalla, September -2018
	• Structural Analysis, R. C. Hibbeler, 2018
3	Structural Engineering Web Sites -ASCE Periodicals.

9. Facilities required for teaching and learning:

	Facility					
1	Seminar	3	teaching aids as interactive (smart) board			
2	discussions rooms with internet connections	4	Data show			





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10.	Matrix of knowledge and LO's skills of the course:				
No	Торіс	Aims	Competencies	LO's	
1	Basic concept in structural analyses	1, 10	C1	a3	
2	Loads and reactions	1, 10	C1	c3	
3	Statically determinate beams	1, 10	C1, C2, C11	a1, c3	
4	Statically determinate rigid frames	1, 10	C1, C2, C11	a1, c3	
5	Statically determinate arches	1, 10	C1, C2, C11	a1, c3	
6	Statically determinate trusses.	1, 10	C1, C2	c3	
7	Influence lines for Statically determinate structures	1, 10	C1, C2	c3	

Course Coordinator: Dr. Rafeek Wadieh **Head of Department:** Prof. Dr. Mohamed Elkiki

Date of Approval: 2022





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<u>Computer Programming</u> (ENG201)

1. Basic Information:

Program Title	All Programs	
Department Offering the Dregram	Communications and Electronics Engineering	
Department Onering the Program	Program	
Department Responsible for the Course	Basic Science and Engineering Department	
Course Title	Computer Programming	
Course Code	ENG201	
Year/Level	Level 2	
Specialization	Major – Compulsory Course	
Authorization Date of Course Specification	-	
Pre- request	-	

Taaahing hours	Lectures	Tutorial	Practical	
Teaching nours	2	-	2	

2. Course Aims:

No.	Aims
1	Apply acquired knowledge in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify diagnose and solve engineering problems
1	of varying complexity and variation.
	Communicate effectively with a variety of audiences using a variety of forms, methods, and
5	languages; cope with academic and professional issues in a critical and creative manner; and
	display leadership, business administration, and entrepreneurial abilities.

3. Competencies:

Competencies	Learning Outcomes (LO'S)		
	b3 Applying engineering basics that are relevant to		
C1 Identify, formulate, and solve complex	the computer programing (java)		
engineering problems by applying	c1 Solve engineering problems by applying		
engineering fundamentals, basic science,	engineering different algorithms.		
and mathematics.	c2 Identify complex engineering problems by		
	applying engineering fundamentals for solving.		
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.	 a1 Describe an appropriate system by applying "java "language programming. b3 Interpret data problems to identify java programs. c1 Choose relevant computer-based software for modelling to analysis java programs 		

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Basic concepts of programming.	2	-	2






	Practical: problem analysis& developing the programs charts& Structured programming			
2	Introduction Java Applications Practical: Form of the Program& fundamentals of Java programming language and its syntax& Primitive data types, operators, variables & Joptionpane & scanner Classes.	4	-	4
3	Branching [Control Statements]. Practical: programs about (If statement, If -Else, Nested IF, Switch)	2	-	2
4	[Iterations] Control Statements. Practical: solved problems about (Repetition statements: for, while, do-while& Nested loop &Continue, Break.)	4	-	4
5	Concepts of object-Oriented programming Practical: Examples Of Classes, Inheritance Concept.	2	-	2
6	Methods in java. Practical: problems of (Declare method& Message passing& Method overloading)	2	-	2
7	Arrays and Array list Practical: Create Array& Matrix& Array List.	4	-	4
8	Introduction to java Applets. Practical: java Applets programs.	4	-	4
9	Graphical user interface (GUI). Practical: GUI exercises.	4	-	4
	Total	28	-	28

5. Teaching and learning methods:

Topics		Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
Basic concepts of programming. Practical: problem analysis& developing the programs charts& Structured programming	X	X			х	X								x





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Introduction Java Applications Practical: Form of the Program& fundamentals of Java programming language and its syntax& Primitive data types, operators, variables & Joptionpane & scanner Classes.	X	X		X	X				X
Branching [Control Statements]. Practical: programs about (If statement, If -Else, Nested IF, Switch)	x	x		x	x				x
[Iterations] Control Statements. Practical: solved problems about (Repetition statements: for, while, do-while& Nested loop &Continue, Break.)	Х	X		X	X				X
Concepts of object-Oriented programming Practical: Examples of Classes, Inheritance Concept.	X	X		X	X				X
Methods in java. Practical: problems of (Declare method& Message passing& Method overloading)	х	х		X	X				X
Arrays and Array list Practical: Create Array& Matrix& Array List.	х	X		x	X				X
Introduction to java Applets. Practical: java Applets programs.	x	X		X	X				X
Graphical user interface (GUI). Practical: GUI exercises.	x	x		x	x				x

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases





3	Asking small groups to do assignments; each composed of low, medium, and high-	Knowledge and skills transfer among different levels of students
	performance students.	

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1, C2	b3, c1
2	Semester work (report, quizzes)	C1, C2	c1, c2
3	Final term examination	C1, C2	a1, b3
4	Practical	C1, C2	c1, c2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	14 th
3	Final term examination	15 th

7.3 Weighting of Evaluation:

7.5 Weighting of Evaluation.							
No.	Evaluation Method	Weights					
1	Mid-term examination	10%					
2	final examination	60%					
3	Practical examination	10%					
4	Semester work	20%					
	Total	100%					

8. List of References:

No.	Reference List
1	Jeffrey L. Nyhoff, Larry R. Nyhoff "Processing: An Introduction to Programming" ebook
	(2017).
2	Usman Opeyemi Lateef, Akeem Owoade, Abimbola B.L. and Gbenga Ogunsanwo
	"introduction to computer programming" 2nd edition, College of Science, and Information
	Technology, (2016).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Computer lab.
3	Presenter
4	White board
5	Data show system

10. Matrix of teaching and learning methods:

No.	Торіс	Aims	Competencies	LO's
	Basic concepts of programming.			
1	Practical: problem analysis & developing the programs charts&	1	C1	b3, c1
	Structured programming			
2	Introduction Java Applications	1	C1	b3







	Practical: Form of the Program& fundamentals of Java			
	programming language and its syntax& Primitive data types,			
	operators, variables & Joptionpane & scanner Classes.			
	Branching [Control Statements].			
3	Practical: programs about (If statement, If -Else, Nested IF,	1	C1	b3
	Switch)			
	[Iterations] Control Statements.			
4	Practical: solved problems about (Repetition statements: for,	1	C1	c2
	while, do-while& Nested loop &Continue, Break.)			
5	Concepts of object-Oriented programming	1	C^{2}	h3
5	Practical: Examples of Classes, Inheritance Concept.	1	02	05
	Methods in java.			
6	Practical: problems of (Declare method& Message passing&	1	C2	al
	Method overloading)			
7	Arrays and Array list	1	C^{2}	-1
/	Practical: Create Array& Matrix& Array List.	1	C2	CI
0	Introduction to java Applets.	1	C1	1.2
8	Practical: java Applets programs.	1	CI	03
0	Graphical user interface (GUI).	1	\mathbf{C}^{2}	a1 a1
9	Practical: GUI exercises.	1	0.2	a1, C1

Course Coordinator: Dr. Amira El Sonbaty **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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Engineering Thermodynamics (ENG202)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Chemical Engineering Program
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Engineering Thermodynamics
Course Code	ENG202
Year/Level	level 2
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG102

Taaahing haung	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims
1	Master a broad range of engineering thermodynamics knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying thermodynamics laws to identify, diagnose, and solve engineering problems of varying complexity and variation.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
	a1 Demonstrate the thermodynamics laws that apply to the engineering
	problems.
	a2 Explain the basic principles of engineering thermodynamics.
C1 Identify, formulate,	a3 Study the concepts and theories of mathematical, science necessary
and solve complex	for engineering thermodynamic properties for different types of systems.
engineering problems by	b1 Select the appropriate solutions for engineering problems and system
applying engineering	design, gas power cycles, vapor cycles.
fundamentals, basic	b2 Using scientific concepts and thermodynamics laws that are relevant
science, and	to the real life.
mathematics.	c1 Modify engineering knowledge and understanding to improve design,
	products and services, gas power cycles, vapor cycles.
	c2 Solve complex engineering problems by applying the concepts and
	the thermodynamics laws.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Fundamental concepts - Properties of a pure substance	2	2	-
2	Equation of state - thermodynamic systems - Work and heat	2	2	-
3	First law of thermodynamics; Applications to Systems and Control Volumes	6	6	-





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No.	Topics	Lectures	Tutorial	Practical
4	Second Law of Thermodynamics; Principle of Carnot cycles	4	4	-
5	Heat engines, Refrigerators, and heat pumps - Principle of the increase of entropy	4	4	-
6	Applications to systems and control volumes - Irreversibility and availability	6	6	-
7	Power and refrigeration cycles	4	4	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
Fundamental concepts - Properties of a pure substance	x	x			x									
Equation of state - thermodynamic systems - Work and heat	X	X			X	X								
First law of thermodynamics; Applications to Systems and Control Volumes	X	x			x	x								
Second Law of Thermodynamics ; Principle of Carnot cycles	х	х			Х	Х								
Heat engines, Refrigerators, and heat pumps - Principle of the increase of entropy	X	X			X									





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Applications to systems and control volumes - Irreversibility and availability	x	x		x					
Power and refrigeration cycles	x	x		x					

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason				
1	Presentation of the course in digital material.	Better access any time				
2	Web communication with students.	Better communication with certain cases				
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different levels of students				

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	a1, a2, b1
2	Semester work (quizzes, sheets, report)	C1	c1, c2
3	Final term examination	C1	a3, b1, b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks						
1	Midterm examination	8 th						
2	Semester work	2^{nd} , 7^{th} , 9^{th} , 14^{th}						
3	Final term examination	15 th						

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	final examination	60%
3	Semester work	20%
	Total	100%

8. List of References:

No.	Reference List
1	P. K. Nag "Engineering Thermodynamics 6th Edition" McGraw Hill Education; Sixth
1	edition (2017).
2	Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner, Margaret B. Bailey "Fundamentals
2	of Engineering Thermodynamics" 9th edition Wiley (2018)

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter





3	White board
4	Data show system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Fundamental concepts - Properties of a pure substance	1	C1	a1, a2
2	Equation of state - thermodynamic systems - Work and heat	1	C1	a1, a2
3	First law of thermodynamics; Applications to Systems and Control Volumes	1	C1	a1, a2, b2
4	Second Law of Thermodynamics; Principle of Carnot cycles	1	C1	b1, b2, c1
5	Heat engines, Refrigerators, and heat pumps - Principle of the increase of entropy	1	C1	b1, c1
6	Applications to systems and control volumes - Irreversibility and availability	1	C1	a3, c2
7	Power and refrigeration cycles	1	C1	b1, c1

Course Coordinator: Prof. Dr Abd Elnaby Kabeel **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>Technical English Language (2)</u> (LNG201)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Technical English Language (2)
Course Code	LNG201
Year/Level	Level 2
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	LNG101

Taaahing hours	Lectures	Tutorial	Practical			
Teaching nours	1	-	2			

2. Course Aims:

No.	Aims
	Communicate effectively with a variety of audiences using a variety of forms, methods, and
5	languages; cope with academic and professional issues in a critical and creative manner; and
	display leadership, business administration, and entrepreneurial abilities.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C5 Practice research techniques and methods of investigation as an inherent part of learning.	a1 Define technical language and report writing
C8 Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1 Communicate effectively.d2 Demonstrate efficient IT capabilities.
C10 Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	d1 Search for information to engage in lifelong self-learning discipline.d2 Professionally merge the language skills in self-learning

4. Course Contents:

No	Content	Lecture	Tutorial	Practical
1	Water Lab skills in English: Lesson 1 Bob drives a hard bargain&	2	-	4
	Lesson 2 Bob's big coolie order& grammar topics			
2	Chemical and physical properties. Lab skills in English Lesson 3 Amber comes over to bake cookies & Lesson 4Amber and Ted heat up the kitchen& grammar topics	2	-	4
3	Water cycle	1	-	2





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	Lab skills in English lesson 5 Nicole practices her election speech& grammar topics			
4	Human uses Lab skills in English: Grammar topics	2	-	4
5	Heat transfer Lab skills in English lesson 6 Bob brings the cookies to the village market& lesson 7 Carol tells Bob the good news& grammar topics	2	_	4
6	Graphic language Lab skills in English: lesson 8 Everyone bakes cookies & lesson 9 Nicole's close election & grammar topics	2	-	4
7	Energy Lab Skills in English lesson 10 Bob gets any angry call from Carol & Grammar topics	2	-	4
8	Automatic Control Lab Skills in English Grammar topics	1		2
	Total	14	-	28

5. Teaching and learning methods:

Topics	Face to face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
Water Lab skills in English: Lesson 1 Bob drives a hard bargain& Lesson 2 Bob's big coolie order& grammar topics	X	X			x	x								
Chemical and physical properties. Lab skills in English Lesson 3 Amber comes over to bake cookies & Lesson 4Amber and Ted heat up the kitchen& grammar topics	X	X			X	X								
Water cycle Lab skills in English lesson 5 Nicole practices her election speech& grammar topics	X	X			X	X								





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Human uses Lab skills in English: Grammar topics	X	х		x	x				
Heat transfer Lab skills in English lesson 6 Bob brings the cookies to the village market& lesson 7 Carol tells Bob the good news& grammar topics	X	X		X	X				
Graphic language Lab skills in English: lesson 8 Everyone bakes cookies & lesson 9 Nicole's close election & grammar topics	X	X		X	x				
Energy Lab Skills in English lesson 10 Bob gets any angry call from Carol & Grammar topics	X	X		X	X				
Automatic Control Lab Skills in English Grammar topics	X	x		x	x				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason			
1	Presentation of the course in digital material	Better access any time			
n	Asking small groups to do assignments; each composed	Knowledge and skills transfer			
2	of low, medium, and high-performance students.	among different level of students.			

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C8, C10	d1, d2
2	Semester work (quizzes, sheets, report)	C8	d1, d2
3	Practical exam	C8, C10	d1, d2
4	Final term examination	C10	d1, d2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	$7^{\text{th}},9^{\text{th}}$
3	Practical examination	14 th
4	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	10%
2	Semester work	20%
3	Practical examination	10%





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4	Final term examination	60%	
	Total 100%		

8. List of References:

No.	Reference List
1	David Bonamy "Technical English" Longman Publishing Group 2016
2	Paul J. Hamel "English for Better Jobs 1: Language for Working and Living" Create Space Independent Publishing Platform; 1st edition (2016)/
3	Mahmood Reza Atai, Alireza Zaré Alanagh, Morteza Nasiri and Reza Taherkhani "English for The Students of Engineering" 1st edition, SAMT Publication (2016).

9. Facilities required for teaching and learning:

No.	Facility				
1	Lecture classroom	3	Seminar		
2	Computer lab.	4	White board	5	Data Show system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Water Lab skills in English: Lesson 1 Bob drives a hard bargain & Lesson 2 Bob's big coolie order & grammar topics	5	C8	d1, d2
2	Chemical and physical properties. Lab skills in English Lesson 3 Amber comes over to bake cookies & Lesson 4Amber and Ted heat up the kitchen & grammar topics	5	C8	d1, d2
3	Water cycle Lab skills in English lesson 5 Nicole practices her election speech & grammar topics	5	C8	d1, d2
4	Human uses Lab skills in English: Grammar topics	5	C10	d2
5	Heat transfer Lab skills in English lesson 6 Bob brings the cookies to the village market& lesson 7 Carol tells Bob the good news & grammar topics	5	C10	d2
6	Graphic language Lab skills in English: lesson 8 Everyone bakes cookies & lesson 9 Nicole's close election & grammar topics	5	C10	d2
7	Energy Lab Skills in English lesson 10 Bob gets any angry call from Carol & Grammar topics	5	C10	d1, d2
8	Automatic Control Lab Skills in English Grammar topics	5	C10	d1, d2

Course Coordinator: Dr. Doaa Elshrbiny **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>Mathematics (4)</u> (MTH202)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Mathematics (4)
Course Code	MTH202
Year/Level	Level 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	MTH101

Teaching hours	Lectures	Exercise	laboratory	Student's load
reaching nours	2	2	-	5

2. Course Aims:

No.
1

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	 a1 Learn the general principles of differential equations and series and its applications in mathematical engineering. a2 Describe the effect of mathematical engineering principles and theories that apply in the most fundamental problems. a3 Define the basic concepts of series and analytic functions. b1 Use the basics of Complex Analysis and Special functions to solve engineering problems. c1 Apply the methods of solving partial differential equations to generate solutions for heating and wave equations.

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Special functions	4	4	-	8
2	Fourier series	2	2	-	4
3	periodic functions and Euler's laws	4	4	-	8
4	Fourier's integrations – solutions of the differential	2	2	-	8





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5	equations by series - solving the partial differential equations using variables separation	2	2	-	4
6	Functions with complex variables – complex quantities algebra	2	2	-	4
7	multiple values functions - the analytical functions and Koshi's theorem	2	2	-	8
8	the complex series	2	2	-	4
9	Taylor and Lorant series - the zeros, unique points, and the rest - the infinite series.	8	8	-	8
	Total	28	28	-	56

5. Teaching and learning methods:

No	Topics	Face-to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
1	Special functions	x	x			x	x	x							
2	Fourier series	X	X			X	X	X							
3	periodic functions and Euler's laws	x	x			x	x	X							
4	Fourier's integrations – solutions of the differential	X	X			X	X	X							
5	equations by series - solving the partial differential equations using variables separation	x	x			x	x	X							
6	Functions with complex variables – complex	x	x			x	x	X							





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	quantities algebra										
7	multiple values functions - the analytical functions and Koshi's theorem	X	x		X	X	X				
8	the complex series	x	x		x	X	X				
9	Taylor and Lorant series - the zeros, unique points and the rest - the infinite series.	X	X		X	X	X				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencie	es LO's
1	Periodic exams	C1	a1, a2, a3, b1
2	Semester work (quizzes, sheets, report)	C1	a1, c1
3	Final term examination	C1	b1, a3, c1
7.2 Ev	valuation Schedule:		
No.	Evaluation Method		Weeks
1	Periodic exams		$8^{ ext{th}}$
2	Student load		2^{nd} - 7^{th} - 14^{th}
3	Final term examination		15 th
7.3 w	eighting of Evaluation:		
No.	Evaluation Method		Marks
1	Periodic exams		30
2	Student load		30
3	Final term examination		90
	Total		150





8. List of References:

No.	Reference List
1	Brett Borden and James Luscombe "Fourier series and integrals" Morgan & Claypool Publishers (2017).
2	Chris McMullen "Essential Calculus Skills Practice Workbook with Full Solutions" Zishka Publishing (2018).

9. Facilities required for teaching and learning:

	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of Competencies and LO's of the course:

No.	Торіс	Aims	Competencies	LO's
1	Special functions	1	C1	a1, b1
2	Fourier series	1	C1	a1, a2
3	periodic functions and Euler's laws	1	C1	a3
4	Fourier's integrations – solutions of the differential	1	C1	c1
5	equations by series - solving the partial differential equations using variables separation	1	C1	c1
6	Functions with complex variables – complex quantities algebra	1	C1	b1
7	multiple values functions - the analytical functions and Koshi's theorem	1	C1	b1
8	- the complex series	1	C1	b1
9	Taylor and Lorant series - the zeros, unique points and the rest - the infinite series.	1	C1	a3

Course Coordinator: Dr. Samar Madian **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022







Surveying (1) (CIE203)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Surveying (1)
Course Code	CIE203
Year/Level	Level 2
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre-request	-

Teaching hours	Lectures	Tutorial	Practical		
reaching nours	2	1	1		

2. Course Aims:

No.	Aims
1	Applying theories and abstract thinking in analytic critical and systemic thinking to identify and solve engineering problems of varying complexity and variation.
10	Select appropriate and sustainable technologies for civil engineering fields such as surveying.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex	a2 Explain the scientific principles and theories that
engineering problems by applying	apply to the topic.
engineering fundamentals, basic science,	b1 Using math ideas and theories that are applicable to
and mathematics.	the field.
C2 Develop and conduct appropriate	
simulation, analyze, and interpret data,	
assess, and evaluate findings, and use	b1 Conduct basic experiments to learn about the basic
statistical analyses and objective	characteristics and features of surveying
engineering judgment to draw	
conclusions.	
C11 Select appropriate and sustainable	
technologies for construction of buildings,	
infrastructures, and water structures; using	
either numerical techniques or physical	al Recognize the fundamentals of surveying,
measurements and/or testing by applying a	c1 Using either physical measurements and/or testing
full range of civil engineering concepts	by applying a full range of civil engineering concepts
and techniques of structural analysis and	and techniques of surveying.
mechanics, properties and strength of	
materials, surveying, soil mechanics,	
hydrology and fluid mechanics.	





4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Introduction to Surveying: basic definitions, classification of maps and scales. Introduction to leveling. Types of levels Practical: Learn about levels devices	4	2	2
2	Mapping using linear measurements. Practical: measuring some buildings and details inside the institute using the tape	6	3	3
3	Levelling instruments, method of calculation, cross and longitudinal sections, contouring earth work Practical: Use level and take differential readings between points. Create longitudinal level	10	5	5
4	Compass surveying and traverse computation area determination Practical: Make a landline and calculate an area adjacent to it	4	2	2
5	Theodolite: temporary setting up, measuring of horizontal and vertical angles Practical: Identifying theodolite, methods of controlling it, and reading the vertical and horizontal angles	2	1	1
6	Permanent adjustment of theodolite, errors in measuring horizontal and vertical angles Practical: Using theodolite as a model to identify permanent errors in theory	2	1	1
	Total	28	14	14

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Introduction to Surveying: basic definitions, classification of maps and scales. Introduction to leveling. Types of levels Practical: Learn about levels devices	X				X	X								X
Mapping using linear measurements.	x				x	x								X





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Practical: measuring some buildings and details inside the institute using the tape									
Levelling instruments, method of calculation, cross and longitudinal sections, contouring earth work Practical: Use level and take differential readings between points. Create longitudinal level	X		X	X	X				X
Compass surveying and traverse computation area determination Practical: Make a landline and calculate an area adjacent to it	X			X	X				X
Theodolite: temporary setting up, measuring of horizontal and vertical angles Practical: Identifying theodolite, methods of controlling it, and reading the vertical and horizontal angles	X			X	X				X
Permanent adjustment of theodolite, errors in measuring horizontal and vertical angles Practical: Using theodolite as a model to identify permanent errors in theory	x			x	x				X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low medium and high- performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1, C11	a2, a1
2	Semester work (quizzes, sheets, report)	C10	d1, d2
3	Practical examination	C1, C11	b1, c1
4	Final term examination	C1	a2, b1
		C11	al, cl





7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks				
1	Semester work	$2^{nd}, 7^{th}, 9^{th}$				
2	Mid Term examination	8 th				
3	Practical examination	14 th				
4	Final term examination	15 th				
7.3 Weighting of Evaluation:						
No.	Evaluation method	Weights				
1	Mid-term examination	10%				
2	Practical examination	10%				
3	Semester work	20%				
4	Final-term examination	60%				
	Total	100%				

8. List of References:

No.	Reference List
1	Walker, J., and Awange, J. L. (2020) Surveying for Civil and Mine Engineers.
2	Recommended books Wolf, P.R. and Brinker, R.C., Elementary Surveying, 10 th ed., Harper Collins College Publisher, NY, USA (2002)

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system
5	Lab

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction to Surveying: basic definitions, classification of maps and scales. Introduction to leveling. Types of levels Practical: Learn about levels devices	1, 10	C1 C11	a2, b1
2	Mapping using linear measurements. Practical: measuring some buildings and details inside the institute using the tape	1, 10	C1	a2
3	3 Levelling instruments, method of calculation, cross and longitudinal sections, contouring earth work Practical: Use level and take differential readings between points. Create longitudinal level		C11	al
4	Compass surveying and traverse computation area determination Practical: Make a landline and calculate an area adjacent to it	1, 10	C1 C11	a2 a1







5	Theodolite: temporary setting up, measuring of horizontal and vertical angles Practical: Identifying theodolite, methods of controlling it, and reading the vertical and horizontal angles	1, 10	C1 C11	b1 C1
	Permanent adjustment of theodolite, errors in measuring horizontal and vertical angles Practical: Using theodolite as a model to identify permanent errors in theory	1, 10	C1 C11	a2, b1 a1, C1

Course Coordinator: Dr. Ayman Helal **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Structures Analysis (2)</u> (CIE301)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Structures Analysis (2)
Course Code	CIE301
Year/Level	Level 3
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre-request	CIE202

Taaahing houng	Lectures	Tutorial	Practical
reaching nours	3	2	-

2. Course Aims:

No.	Aims
1	Use engineering knowledge, mathematics, structural engineering concepts, and constructed
1	structures to solve structural problems.

3. Intended Learning Outcomes (LO'S):

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	a1 Describe how to solve structure problems using relevant mathematical principles and theories.b3 Applying engineering fundamentals to structure-related issues.
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.	a1 Define structural analysis and mechanics' basic characteristics, properties, concepts, and techniques.
C11 Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical technique and techniques of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology and fluid mechanics.	a1 Recognize the fundamentals of structural analysis and mechanics, as well as material properties and strength.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Properties of plane sections	9	6	-
2	Normal, shear and combined stresses	12	8	-
3	Elastic deformation of statically determinate structures	15	10	-





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4	Analysis of statically indeterminate structures using the equation of three moments	6	4	-
	Total	42	28	-

5. Teaching and learning methods:

Topics	Face to face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Recently	Cooperative	Discovering	Modeling	lab
Properties of plane sections	x	x			X	x	x							
Normal, shear and combined stresses	x	x			X	x	x							
Elastic deformation of statically determinate structures	x	x			x	x	x							
Analysis of statically indeterminate structures using the equation of three moments	X	x			X	X	X							
Properties of plane sections	x	x			X	x	x							

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different level of students.

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid Term Examination	C1 C2	a1, a3
2	Semester work	C11	al
3	Final Term Examination	C1 C2	a1, a3 a1
5		C11	al





7.2 Evaluation Schedule:

	anaution Schedule:					
No.	Evaluation Method	Weeks				
1	Mid Term Examination	8 th				
2	Semester work	$2^{nd}, 7^{th}, 9^{th}$				
3	Final Term Examination	15 th				
7.3 W	7.3 Weighting of Evaluation:					
No.	Evaluation method	Weights				
1	Mid-term examination	20%				
2	Semester work	20%				
3	Final-term examination	60%				
	Total	100%				

8. List of References:

No.	Reference List
1	 Essential books (textbooks) W. M. El-dakhakhni, "Theory of Structures", Part One, Assiut University, 1973, 1974. W. M. El-dakhakhni, "Theory of Structures", Part Two, Assiut University, 1973, 1974. R. C. Coats, M. G. Coutie and F. K. Kong, "Structural Analysis", Second Edition, NCN 420- 5870, 1, ELPS, 2007.
2	Recommended books Structural Analysis 2: Statically Indeterminate Structures, S. Khalfalla, September -2020. Structural Analysis, R. C. Hibbeler, 2018. Structural Analysis 2: Statically Indeterminate Structures, Salah Khalfallah · 2018

9. Facilities required for teaching and learning:

No.	Facility
1	Seminar
2	Discussions rooms with internet connections
3	Teaching aids such as interactive (smart) board
4	Data show

10. Matrix of knowledge and skills of the course:

No.	Торіс	Aims	Competencies	LO's
1	Properties of plane sections	1	C1	a1, a3
n	Normal, shear and combined stresses		C1	a1, a3
2			C2	al
3	Elastic deformation of statically determinate structures	1	C11	al
4	Analysis of statically indeterminate structures using the	1	C2	al
4	equation of three moments	1	C11	al

Course Coordinator: Dr. Rafeek Wadieh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Strength of Materials</u> (ENG205)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Strength of Materials
Course Code	ENG205
Year/Level	Level 2
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG101

Taaahing haung	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims
2	Work in and manage a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance; and behave professionally and adhere
-	to engineering ethics and standards.
	Use the techniques, skills, and current engineering tools required for engineering practice of
3	Statics applications by taking full responsibility for one's own learning and development,
	participating in lifelong learning and consider the impact of statics study in real world, and
	its strong relation with environment and almost of all the technology fields upgrades.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify,	al Define the concepts and theories of mathematics, necessary for engineering
formulate, and	system analysis, general concepts of strength of material, normal stress, direct
solve complex	shear stress, Mohr's cycle.
engineering	b1 Use math ideas and theories that are applicable to solutions for engineering
problems by	problems and system design, normal stress, direct shear, stresses in beams,
applying	torsional stresses.
engineering	c2 Practice the neatness and aesthetics in design to approach stresses in beams,
fundamentals,	torsional stresses, and pressure vessels.
basic science,	c3 Apply engineering knowledge and understanding to improve design, products
and	and/or services, normal stress, direct shear stress, stresses in beams, torsional
mathematics.	stresses, pressure vessels, Mohr's cycle.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Simple states of stress and strain	2	2	-
2	Tension and compression stress	4	4	-
3	Shear stress in bolts	4	4	-





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4	Bending and shearing stresses in beams	4	4	-
5	Torsion stresses	2	2	-
6	Deflection of Beams	4	4	
7	Analysis of thin-walled pressure vessels	4	4	-
8	Analysis of plane stress	4	4	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self - learning and Research	Cooperative	Discovering	Modeling	lab
Simple states of stress and strain		X			X	X								X
Tension and compression stress		x			x	x								x
Shear stress in bolts		х			Х	х								х
Bending and shearing stresses in beams		X			X	X								X
Torsion stresses		Х			Х	Х								Х
Deflection of Beams		Х			Х	Х								Х

6. Teaching and learning methods for disabled students:

No	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different level of students.

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid Term examination	C1	a1, b1
2	Semester work (quizzes, sheets, report)	C1	c2, c3
3	Final term examination	C1	a1, b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	$2^{nd}, 7^{th}, 9^{th}$
2	Mid Term examination	8 th





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3	Final term examination	15 th
7.3 W	eighting of Evaluation:	
No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference list
1	T. D. Gunneswara Rao and Mudimby Andal " Strength of Materials: Fundamentals and Applications" Cambridge University Press; 1st edition (2020).
2	Akira Todoroki "Fundamentals of Mechanics of Materials: Part 1 Stress, Strain, Torsion" 2017.

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Simple states of stress and strain	2	C1	a1, b1
2	Tension and compression stress	2	C1	a1, b1
3	Shear stress in bolts	2	C1	a1, b1
4	Bending and shearing stresses in beams	2	C1	a1, b1
5	Torsion stresses	2	C1	a1, b1
6	Deflection of Beams	2	C1	c3
7	Analysis of thin-walled pressure vessels	2	C1	c2, c3
8	Analysis of plane stress	2	C1	c2, c3

Course Coordinator: Prof. Dr. Abd Elnaby Kabeel **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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Introductions to Information Technology (ENG206)

1. Basic Information:

Program Title	All Programs				
Department Offering the Dregram	Communication and electronics Engineering				
Department Offering the Program	Department				
Department Responsible for the Course	Basic Science and Engineering Department				
Course Title	Introductions to Information Technology				
Course Code	ENG206				
Year/Level	Level 2				
Specialization	Major – Compulsory Course				
Authorization Date of Course Specification	-				
Pre- request	-				

Teaching hours	Lectures	Tutorial	Practical		
reaching nours	2	-	2		

2. Course Aims:

No.	Aims								
7	Use the techniques, skills, and appropriate engineering tools, necessary for engineering practice web design project.								

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	 a2 List the engineering-related business and management principles, websites. a3 Define contemporary websites technologies and their applications in relation to engineering field. c3 Utilize modern technologies, programs, applications related by websites.
C8 Communicate effectively graphically, verbally, and in writing with a range of audiences using contemporary tools.	d1 Communicate effectively.d2 Demonstrate efficient IT capabilities.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
	Lecture: Introduction to information systems &			
1	information technology	2	-	2
	Practical: Introduction of html			
	Lecture: information systems & information technology			
2	(Fields- Applications -Examples)	2	-	2
	Practical: html structure code			
2	Lecture: Computer systems	2		2
3	Practical: Font Tags	2	-	2
4	Lecture: Hardware used in information systems	2	-	2





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	Practical: Font Tags			
5	Lecture: Software used in information systems Practical: paragraph tags	2	-	2
6	Lecture: Introduction of data communication system Practical: order lists	2	-	2
7	Lecture: Introduction of Computer Networking Practical: unorder lists	2	-	2
8	Lecture: The internet; the foundations, Resources, and uses of the internet, Practical: Image tag	4	-	4
9	Lecture: Privacy Security and Ethics Practical: horizontal &vertical Rules	2	-	2
10	Lecture: Emphasizing practical skills for finding, Reading, and authorizing materials Practical: Frames	2	-	2
11	Lecture: Introduction of Artificial Intelligence Practical: Tables	2	-	2
12	Lecture: introduction of cloud computing Practical: Hyper Links	2	-	2
13	Lecture: Html Projects	2	-	2
	Total	28	-	28

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Lecture: Introduction to information systems & information technology Practical: Introduction of html	X				X	X								x
Lecture: information systems & information technology (Fields- Applications - Examples) Practical: html structure code	x				х	x								x





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Lecture: Computer systems Practical: Font Tags	x			x	x					x
Lecture: Hardware used in information systems Practical: Font Tags	x			x	x					X
Lecture: Software used in information systems Practical: paragraph tags	x			x	x					X
Lecture: Introduction of data communication system Practical: order lists	X			X	x					X
Lecture: Introduction of Computer Networking Practical: unorder lists	x			x	x					X
Lecture: The internet; the foundations, Resources, and uses of the internet, Practical: Image tag	X			X	X					x
Lecture: Privacy Security and Ethics Practical: horizontal &vertical Rules	X		X	X					X	X
Lecture: Emphasizing practical skills for finding, Reading, and authorizing materials Practical: Frames	x		X	X					x	x
Lecture: Introduction of Artificial Intelligence Practical: Tables	x		x	x					x	x
Lecture: introduction of cloud computing Practical: Hyper Links	x		x	x					x	X
Lecture: Html Projects	X		X	X					X	X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Provide regular quality feedback.	Better access any time
2	Use Direct Instruction.	Better access any time
3	Break learning tasks into small steps.	





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4	Moodle	Better communication with certain cases
5	Forming small groups of two or three students within the class grouped according to their level can help with personalizing the teaching while not sacrificing class instruction time	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

111 01			
No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C4	a2, a3
2	Semester work (quizzes, sheets, report)	C8	d1, d2
3	Practical Examination	C4	c3
4	Final term examination	C4	a2, a3, c3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	2 nd ,7 th ,9 th ,13 th
3	Practical Examination	14 th
4	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights				
1	Mid-term examination	20%				
2	final examination	50%				
3	Practical examination	10%				
4	Semester work	20%				
	Total 100%					

8. List of References:

No.	Reference List
1	INFORMATION TECHNOLOGY : THEORY AND PRACTICE SINHA, PRADEEP K.
	SINHA, PRITII,2018
2	INFORMATION TECHNOLOGY LAW, IAN J. LLOYD ·,2020

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	Computer lab.
4	White board
5	Data show system
6	Wireless internet
7	Sound system
8	Moodle





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<u>10.</u>	Matrix of Competencies and LO's:					
No.	Торіс	Aims	Competencies	LO's		
1	Lecture: Introduction to information systems & information technology Practical: Introduction of html	7	C4	a2, a3		
2	Lecture: information systems & information technology (Fields- Applications -Examples) Practical: html structure code	7	C4	a2, a3, c3		
3	Lecture: Computer systems Practical: Font Tags	7	C4 C8	a2 d2		
4	Lecture: Hardware used in information systems Practical: Font Tags	7	C4 C8	a3 d2		
5	Lecture: Software used in information systems Practical: paragraph tags	7	C4 C8	c3 d2		
6	Lecture: Introduction of data communication system Practical: order lists	7	C4	c3		
7	Lecture: Introduction of Computer Networking Practical: unorder lists	7	C4	a2		
8	Lecture: The internet; the foundations, Resources, and uses of the internet,	7	C4	a2		
9	Lecture: Privacy Security and Ethics Practical: horizontal &vertical Rules	7	C4 C8	c3 d2		
10	Lecture: Emphasizing practical skills for finding, Reading, and authorizing materials	7	C4 C8	c3 d2		
11	Lecture: Introduction of Artificial Intelligence Practical: Tables	7	C4	c3		
12	Lecture: introduction of cloud computing Practical: Hyper Links	7	C4 C8	c3 d1		
13	Lecture: Html Projects	7	C8	d1, d2		

Course Coordinator: Dr. Amira Elsonbaty **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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Electrical Engineering Fundamentals (ENG208)

1. Basic Information:

Program Title	All Programs			
Department Offering the Dregreem	Communication and Electronics Engineering			
Department Offering the Program	Department			
Department Responsible for the Course	Basic Science and Engineering Department			
Course Title	Electrical Engineering Fundamentals			
Course Code	ENG208			
Year/Level	Level 2			
Specialization	Major – Compulsory Course			
Authorization Date of Course Specification	n -			
Pre- request	-			

Taaabing hours	Lectures	Tutorial	Practical		
reaching nours	2	2	-		

2. Course Aims:

No.	Aims
2	Apply analytic critical and systemic thinking to discover, analyze, and solve a wide range of electrical engineering problems;
7	Proper utilization of modern electrical engineering techniques, skills, and tools

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a1 Identify the mathematical principles and theories that are relevant to the electrical circuit. c1 Solve engineering problems by applying mathematics and science concepts and theories appropriate to the discipline to identify, formulate and solve complex electrical engineering problems. c2 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals electrical
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 conclude.	b3 Analyze and interpret data.





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4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Direct Current	2	2	-
2	Theory of electric circuits	6	6	-
3	Delta and Star connections	1	1	-
4	Sine A.C and D.C circuits	5	5	-
5	Time vectors diagram	2	2	-
6	Electric power and power factor in A.C circuits	2	2	-
7	3-Phase current - Electric machines - D.C machines	4	4	-
8	Transformers	2	2	-
9	Induction and synchronous machines	2	2	-
10	Fractional power machine	2	2	-
	Total	42	28	_

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Direct Current		x			x	x								x
Theory of electric circuits		x			x	x								x
Delta and Star connections		x			x	x								x
Sine A.C and D.C circuits		x			x	x								x
Time vectors diagram		x			x	x								x
Electric power and power factor in A.C circuits		X			X	X								X
3-Phase current - Electric machines - D.C machines		x			x	x								x
Transformers		x			x	x								x
Induction and synchronous machines		x			x	x								x
Fractional power machine		x			x	x								x







6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason		
1	Presentation of the course in digital material	Better access any time		
2	Web communication with students	Better communication with certain cases		
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different levels of students		

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midtorn exemination	C1	a1, c1, c2
	Midlerin examination	C2	b3
2	Semester work (quizzes, sheets, report)	C2	b3
3	Final term examination	C2	b3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	2^{nd} , 7^{th} , 9^{th} , 14^{th}
3	Final term examination	15 th

7.3 Weighting of Evaluation:

7.5 Weighting of Evaluation:					
No.	Evaluation Method	Weights			
1	Mid-term examination	20%			
2	Semester work	20%			
3	final examination	60%			
	Total	100%			

8. List of References:

No.	Reference List
1	Fundamentals of electric circuits alexander sadiku 4th edition.2019.
2	Fundamentals of Electrical Circuit Analysis, March 2018

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	White board
4	Data show system
5	Wireless internet
6	Sound system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Direct Current	2	C1	al
	Direct Current		C2	b3
2	Theory of electric circuits	2	C1	a1, c1







			C2	b3
3	Delta and Star connections	7	C1	c1
4	Sine A.C and D.C circuits	7	C1 C2	c2 b3
5	Time vectors diagram	7	C1	c1
6	Electric power and power factor in A.C circuits	7	C1	c1
-			C2	b3
7	3-Phase current - Electric machines - D C machines	7	C1	a1, c2
/	5-1 hase current - Electric machines - D.C machines	/	C2	b3
8	Transformers	7	C1	c1
0	Induction and gymphysical machines	7	C1	a1, c1
9	mouchon and synchronous machines	/	C2	b3
10	Fractional power machine	7	C1	a1, c1

Course Coordinator: Dr. Rabab Reda **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022




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Engineering Probability and Statistics (MTH301)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Engineering Probability and Statistics
Course Code	MTH301
Year/Level	Level 3
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaabing boung	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims
1	The ability to apply probability theories and hypothesis testing in analytic critical and systemic
	thinking to solve engineering problems of varying complexity and variation.
6	Analyze data from the intended tests to manage resources creatively

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a1 Describe the relevant mathematical principles and theories in the discipline. a2 Explain the scientific principles and theories that apply to the topic. b1 Use math ideas and theories that are applicable to the field. b3 Applying engineering basics that are relevant to the subject. c2 Identify, formulate, and solve complex engineering problems by applying the concepts and the theories of sciences, appropriate to the discipline.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Probability theory	4	4	-
2	Discrete and continuous probability distributions	6	6	-
3	Statistics in engineering	4	4	-
4	Descriptive Statistics Sampling distributions	2	2	-
5	Estimation and confidence intervals	4	4	-
6	Hypothesis testing	4	4	-
7	Simple regression	4	4	-
	Total	28	28	





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5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Probability theory		x			x	x								x
Discrete and continuous probability distributions		x			x	x								x
Statistics in engineering		x			x	x								x
Descriptive Statistics Sampling distributions		x			x	x								x
Estimation and confidence intervals		x			x	x								x
Hypothesis testing		x			x	x								x
Simple regression		x			x	x								x

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	a1, a2, b3
2	Semester work (quizzes, sheets, report)	C1	a1, c2
3	Final term examination	C1	a2, b1, b3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	2^{nd} - 7^{th} - 9^{th} - 14^{th}
3	Final term examination	15 th





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7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. List of References:

No.	Reference List	
1	E. Kreyszig "Advanced Engineering Mathematics" 11th edition, John Wiley	and Sons, Inc.
1	2009	
	Andrew Metcalfe, David Green, Tony Greenfield, Mayhayaudin Mansor, A	Andrew Smith,
2	Jonathan Tuke "Statistics in	Engineering
	With Examples in MATLAB" 2 nd Edition, Chapman and Hall/CRC (2019).	

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	White board
4	Data show system
5	Sound system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Probability theory	1	C1	al
2	Discrete and continuous probability distributions	6	C1	a2
3	Statistics in engineering	1	C1	b3
4	Descriptive Statistics Sampling distributions	1	C1	b1
5	Estimation and confidence intervals	1	C1	c2
6	Hypothesis testing	6	C1	c2
7	Simple regression	6	C1	c2

Course Coordinator: Dr. Samar Madian **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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Properties and Strength of Materials (CIE302)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Properties and Strength of Materials
Course Code	CIE302
Year/Level	Level 3
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre-request	-

Teeshing houng	Lectures	Tutorial	Practical		
reaching nours	2	1	1		

2. Course Aims

No.	Aims
	Select appropriate and sustainable technologies for construction of buildings, infrastructures,
8	and water structures, using numerical techniques, experiment measurements, and testing by
	applying a full range of civil engineering fields such as properties and strength of materials
10	Use the techniques, skills, and current engineering tools required for engineering practice.

3. Competencies:

Competencies	Learning Outcomes (LO'S)			
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	b2 Using scientific concepts			
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	 a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings. b1 Conduct basic experiments to learn about the basic characteristics and features of materials. b3 Interpret data problems to identify java 			
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	 a1 Describe codes of practice, and standards, as well as health and safety regulations. a3 Define contemporary engineering technologies and their applications in relation to disciplines. c4 Apply quality assurance procedures and follow codes and standards. 			





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C11 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: Properties	1 Recognize the fundamentals of properties and strength of materials, 12 Summarize, appropriate and sustainable technologies for construction of puildings.
and strength of materials.	

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Introduction to properties and strength of materials, properties and grading of aggregates (fine – coarse) Practical: Sieve analysis – adsorption – specific gravity – specific volume – fineness modulus	4	4	6
2	Manufacture and types of cement Practical: fineness modulus of cement –compression strength – initial and final setting time	4	-	2
3	Concrete manufacture Practical: slump test – compacting factor test – air content in fresh concrete – compression strength – steel tensile strength	4	-	2
4	Concrete workability	2	6	-
5	Concrete strength in tension, compression, and flexure – concrete durability	4	-	-
6	Concrete mix design	6	8	-
7	Building materials (steel, wood, brick, lime, gypsum, stones, bitumen)	2	-	-
	Total	28	10	18

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Introduction to properties and strength of materials, properties and grading of aggregates (fine – coarse) Practical: Sieve analysis – adsorption – specific gravity –	V			~	\checkmark	V							\checkmark	V





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specific volume – fineness modulus										
Manufacture and types of cement Practical: fineness modulus of cement –compression strength – initial and final setting time	\checkmark		\checkmark	\checkmark	V				\checkmark	\checkmark
Concrete manufacture Practical: slump test – compacting factor test – air content in fresh concrete – compression strength – steel tensile strength	\checkmark		~	~	\checkmark	\checkmark			\checkmark	~
Concrete workability	\checkmark		\checkmark	\checkmark	\checkmark				\checkmark	\checkmark
Concrete strength in tension, compression, and flexure – concrete durability	V			\checkmark	\checkmark					\checkmark
Concrete mix design	\checkmark			\checkmark	\checkmark					\checkmark
Building materials (steel, wood, brick, lime, gypsum, stones, bitumen)	\checkmark			\checkmark	\checkmark	\checkmark				\checkmark

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C2	b3, a2
1	Midterm examination	C4	a1, a3, c4
		C11	a1, a2
C	Conceptor manual (minance alegate man ant)	C4	a1, a3, c4
2	Semester work (quizzes, sheets, report)	C11	a1, a2
		C1	b2
3	Final term examination	C2	a2, b1, b3
		C4	a1, a3, c4

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	all
2	Mid Term examination	8 th







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3	Practical Examination	14 th							
4	Final term examination	15 th							
7.3 Weighting of Evaluation:									
No.	Evaluation Method	Weights							
1	Mid-term examination	10%							
2	Semester work	20%							
3	Practical Examination	10%							
4	Final-term examination	60%							
	Total	100%							

8. List of References:

No.	Reference List
	Course notes
	Egyptian Code for design and construction of reinforced concrete structures – Appendix
	No.3: Guide for laboratory testing of concrete materials.
1	الكود المصري لتصميم وتنفيذ المنشآت الخرسانية ، دليل الإختبارات المعملية للخرسانة ، وزارة الإسكان والمرفق
	والمجتمعات العمرانية ، كود رقم (203) اصدار 2018
	Lecture Notes, Staff of Properties and Testing of Materials
	Egyptian standard specifications, Ministry of Industrial, Latest Version.
	Recommended books
	Prasad, I., "A Textbook of Strength of Materials" Delhi Khanna ,2002
	Komar, A., "Building Materials and Components", Moscow Mir ,2005
2	Printice Hall, New Jersey, 2008.
	Abdul-Rahman, Ali, "Fundamentals of Reinforced Concrete," Faculty of Engineering, Cairo
	University.
	Hilal, M., Theory and Design of Reinforced Concrete Tanks.

9. Facilities required for teaching and learning:

	Fac	y	
1	Lecture classroom	3	White board
2	Seminar	4	Data show system
5	Lab.		

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
	Introduction to properties and strength of materials, properties		C1	b2
1	and grading of aggregates (fine – coarse) Practical: Sieve analysis – adsorption – specific gravity –	10	C4	a3, a1,
	specific volume – fineness modulus		C11	a1, a2
	Manufacture and types of cement		C4	a1, a3,
2	Practical: fineness modulus of cement –compression strength	10		c4
	– initial and final setting time		C11	a1, a2
	Concrete manufacture		C1	b2
3	Practical: slump test – compacting factor test – air content in	8, 10	C4	a3, a1,
	fresh concrete – compression strength – steel tensile strength			c4





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			C11	a1, a2
			C1	b2
4	Concrete workability	8, 10	C4	a3, a1, c4
			C11	a1, a2
	Concrete strength in tension compression and flavura		C1	b2
5	concrete succession in tension, compression and nexure –	8, 10	C4	a3, a1
			C11	a1, a2
			C1	b2
6	Concrete mix design	8, 10	C4	a3, a1, c4
			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	a1, a2
			C1	b2
7	Building materials (steel, wood, brick, lime, gypsum, stones, bitumen)	8, 10	C4	a3, a1, c4
			C11	a1, a2

Course Coordinator: Dr. Nesreen Elawadly **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Principles of Building Construction (CIE303)

1. Basic Information:

Program Title	Civil Engineering Program					
Department Offering the Program	Civil Engineering Department					
Department Responsible for the Course	Civil Engineering Department					
Course Title	Principles of Building Construction					
Course Code	CIE303					
Year/Level	Level 3					
Specialization	Major – Compulsory Course					
Authorization Date of Course Specification	-					
Pre-request	-					

Taaabing boung	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims												
6	Analyze data from the intended tests to manage resources creatively												
10	Select appropriate a infrastructures	and sustainable	technologies	for	construction	of	buildings	and					

3. Competencies:

Competencies	Learning Outcomes (LO'S)						
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	a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings, infrastructures, and water structures.						
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	 a1 Describe codes of practice, and standards, as well as health and safety regulations. a2 List the engineering-related economy. a3 Define contemporary engineering technologies and their applications in relation to disciplines. c4 Apply quality assurance procedures and 						
C11 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 properties and strength of materials	a2 Summarize, appropriate and sustainable technologies for construction of buildings,						





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4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Construction technology of different types of projects	2	2	-
2	Conventional construction methods	2	2	-
3	Construction Equipment	2	2	-
4	Prefabricated construction methods	2	2	-
5	Effect of environment on methods of construction	2	2	-
6	Architectural principals (utilities – services – properties)	2	2	-
7	Safety issues during different stages of construction	2	2	-
	Examples of construction of different types of projects	4	4	-
8	(buildings, roads, RCC dams, marine works, underground structures, etc.)			
0	Building materials technology (steel, concrete, wood and	2	2	-
9	natural stones)			
10	Developing new materials (Fiber reinforced polymers,	4	4	-
10	high strength concrete and ultra-high strength concrete)			
11	Architectural drawings and details	4	4	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Construction technology of different types of projects	x				х	x								
Conventional construction methods	x				X	x								
Construction Equipment	x				X	X								
Prefabricated construction methods	x				Х	х								
Effect of environment on methods of construction	x				x	x								
Architectural principals (utilities – services – properties)	x				x	x								
Safety issues during different stages of construction	x				x	x								





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Examples of construction of different types of projects (buildings, roads, RCC dams, marine works, underground structures, etc.)	X		X	X					
Building materials technology (steel, concrete, wood, and natural stones)	X		X	X	x			X	
Developing new materials (Fiber reinforced polymers, high strength concrete and ultra-high strength concrete)	X		X	X					
Architectural drawings and details	X		X	x					

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midtorn examination	C2	a2
		C4	a3
2	Somester work (quizzes sheets report)	C4	al
	Semester work (quizzes, sheets, report)	C11	a2
3	Final term examination	C4	a1, a3, c4
		C11	a2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks	
1	Midterm examination	8 th	
2	Semester work	7^{th} - 9^{th}	
3	Final term examination	15 th	
7.3 W	7.3 Weighting of Evaluation:		

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Course notes:





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	Are delivered during the lecture, including handout materials such as solved problems, design
	charts, tables, etc.
2	Essential books (textbooks / design codes):
	Egyptian Code for Design and Construction of Reinforced Concrete Structures 203-2018.
	Design Aids and Examples in Accordance with the Egyptian Code for Design and
	Construction of Reinforced Concrete Structures 203-2018.
	Recommended books:
	Chu-Kia Wang and Charles G. Salmon, "Reinforced Concrete Design," 4th Edition, Harper
	and Row Publishers, New York, 1985.
2	MacGregor J., "Reinforced Concrete: Mechanics and Design," Printice Hall, New Jersey,
5	1988.
	Abdul-Rahman, Ali, "Fundamentals of Reinforced Concrete," Faculty of Engineering, Cairo
	University.
	Hilal, M., Theory and Design of Reinforced Concrete Tanks.

9. Facilities required for teaching and learning:

	Facility			
1	Lecture classroom	3	White board	
2	Seminar	4	Data show system	
		5	Gallery	

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Construction technology of different types of projects	4,10	C4	a3, a1, c4
2	Conventional construction methods	4,10	C4 C11	a3 a1, a2
3	Construction Equipment	4,10	C4 C11	a3 a1, a2
4	Prefabricated construction methods	4,10	C4 C11	a3 a1, a2
5	Effect of environment on methods of construction	4,10	C4 C11	a3 a1, a2
6	Architectural principals (utilities – services – properties)	4,10	C4 C11	a3 a1, a2
7	Safety issues during different stages of construction	4,10	C4 C11	a3 a1, a2
8	Examples of construction of different types of projects (buildings, roads, RCC dams, marine works, underground structures, etc.)	4,10	C4 C11	a3, c4 a1, a2
9	Building materials technology (steel, concrete, wood, and natural stones)	4,10	C4 C11	a3, c4 a1, a2
10	Developing new materials (Fiber reinforced polymers, high strength concrete and ultra-high strength concrete)	4,10	C4 C11	a3, c4 a1, a2

Course Coordinator: Dr. Ayman Helal





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Head of Department: Prof. Dr. Mohamed Elkiki Date of Approval: 2022





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<u>Structures Analysis (3)</u> (CIE304)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Structures Analysis (3)
Course Code	CIE 301
Year/Level	Level 3
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	CIE202

Teaching hours	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims
10	Select the appropriate and sustainable technologies for construction of buildings using numerical techniques by applying a full range of civil engineering fields such as structural analysis.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a3 Explain the basic principles of engineering for structural analysis. b3 Applying engineering basics that are relevant to the structural analysis. c2 Practice the neatness and aesthetics in design to approach stresses in beams, torsional stresses, c3 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals.
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.	 a1 Define, basic characteristics, properties, concepts, and techniques of structural analysis and mechanics. c3 Applying statistical analyses and objective engineering judgment to draw conclusions.
C11 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	 a1 Recognize the fundamentals of structural analysis and mechanics. c1 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.





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techniques	of structu	ıral a	analysis	and
mechanics,	properties	and	strength	of
materials,	surveying,	soil	mechai	nics,
hydrology an	nd fluid mech	nanics.		

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Statically indeterminate structures using force method	6	6	-
2	slope deflection method	8	8	-
3	Moment distribution method	10	10	-
4	Introduction to stiffness method	4	4	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	self-learning and Research	Cooperative	Discovering	Modeling	lab
Statically indeterminate structures using force method	X	X			X	X	X							
slope deflection method	X	X			X	X	X							
Moment distribution method	X	X			X	X	X							
Introduction to stiffness method	X	X			x	x	x							

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments each composed	Knowledge and skills transfer
2	of low, medium, and high-performance students.	among different level of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midtorm exemination	C1	a3, c3
1		C11	c1
n	Someoten werk (quizzes sheets non out)	C1	a3, c3
2	Semester work (quizzes, sneets, report)	C11	c1
2	Final terms examination	C1	a3, b3, c3
3	rinal term examination	C2	a1, c3





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		C11	a1, c1
7.2 Ev	aluation Schedule:		
No.	Evaluation Method		Weeks
1	Mid Term Examination		8 th
2	Semester work		2 nd , 7 th , 9 th
3	Final Term Examination		15 th
7.3 W	eighting of Evaluation:		
No.	Evaluation Method		Weights
1	Midterm examination		20%
2	Semester work		20%
3	Final term examination		60%
	Total		100%

8. List of References:

No.	Reference List
	Essential books (textbooks)
1	W. M. El-dakhakhni, "Theory of Structures", Part One, AssiutUniversity, 2016.
	W. M. El-dakhakhni, "Theory of Structures", Part Two, AssiutUniversity, 2016.
	El-Sayed El-Kasaby & Fayez Kaiser, "Theory of Structures-Solved examples", Part 1, 2018.
	Recommended books
2	Structural Analysis, R. C. Hibbeler, 2022.
	Structural Analysis 1: Statically Determinate Structures, S. Khalfalla, September -2018
	Structural Analysis, R. C. Hibbeler, 2018

9. Facilities required for teaching and learning:

	Facil	ity	
1	Seminar	3	Teaching aids as interactive (smart) board
2	Discussions rooms with internet connections	4	Data show

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Statically indeterminate structures using force method	1, 10	C1	a3
2	slope deflection method	1, 10	C1	c3
3	Moment distribution method	1, 10	C1, C2, C11	a1, c3
4	Introduction to stiffness method	1, 10	C1, C2, C11	a1, c3

Course Coordinator: Dr. Rafeek Wadieh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Fluid Mechanics</u> (ENG301)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Fluid Mechanics
Course Code	ENG301
Year/Level	Level 2
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG 102

Taaabing barry	Lectures	Tutorial	Practical	
Teaching nours	2	1	1	

2. Course Aims:

No.	Aims
	Master a broad range of Fluid Mechanics knowledge and specialized skills, as well as the
	ability to understand and apply physical concept knowledge in real-world situations by
1	applying fluid mechanics basic theories. Also, to Apply knowledge of science and
1	engineering concepts to study fluid properties, fluid statics and fluid dynamics and to abstract
	course knowledge that give him or her, the ability to think, identify, diagnose, and solve
	engineering problems of varying complexity and variation in real world as an engineer.
	Use the techniques, skills, and current engineering tools required for engineering practice of
4	fluid mechanics by taking full responsibility for one's own learning and development,
4	participating in lifelong learning, and demonstrating the ability to pursue postgraduate and
	research studies.
8	Consider the impact of fluid mechanics study in real world, and its strong relation with
	environment and almost of all the technology fields upgrades.

3. Competencies

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	 a1 Define concepts of energy, momentum equations and dimensional analysis (laminar and turbulent flow). a2 Explain the basic principles of fluid mechanics engineering. b1 Analyze various ideas and views for different forces on immersed bodies. b2 Using scientific concepts and theories that are relevant to the fluid mechanics. b3 Applying engineering basics that are relevant to the subject.
C2 Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate	a1 Apply knowledge of Bernoulli and continuity equations for experiments of Venturi meter and losses in pipes.a2 Analyze data in laboratory and in pipes and pumps field.





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findings,	and	use	stat	istical	b1	Conduct	basic	experiments	to	learn	about	the	basic
analyses and		obj	ective	cha	racteristic	s and f	eatures of flu	ids	for stat	tics and	l dyn	amics	
engineering	g judg	gment	to	draw	bra	nches.							
conclusions	s.												

4. Course Contents:

No.	Topics	Lecture	Exercise	laboratory	Student load
1	Fluid properties, fluid statics, kinematics	2	1	1	4
2	Fluid dynamics including energy and Momentum equations	4	2	2	8
3	Dimensional analysis, Laminar flow, turbulent flow and its applications	2	1	1	4
4	Forces on immersed bodies, Introduction to compressible flow	4	2	2	8
5	Applications to filtration and fluidization	2	1	1	4
6	Friction losses in pipes.	4	2	2	8
7	Laboratory course in Fluid Mechanics includes experiments on venture-meter, friction losses in pipes	4	2	2	4
8	Center of pressure, Flow measuring apparatus, multi-pump test (Pump characteristics) and losses in piping systems	6	3	3	4
	Total	28	28	14	

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Fluid properties, fluid statics, kinematics	x				x	X								x
Fluid dynamics including energy and Momentum equations	x				x	x								x
Dimensional analysis, Laminar flow, turbulent flow, and its applications	x				x	x								x
Forces on immersed bodies, Introduction to compressible flow	x				x	X								x







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Applications to filtration and fluidization	x		x	x				x
Laboratory course in Fluid Mechanics includes experiments on venture-meter, friction losses in pipes	X		X	x				X
Center of pressure, Flow measuring apparatus, multi-pump test (Pump characteristics) and losses in piping systems	X		X	x				X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1	a1, a2, b1, b2, b3
2	Semester work (quizzes, sheets, report)	C1, C2	a1, b2
3	Final term examination	C1, C2	a1, a2, b1, b2, b3

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	2^{nd} , 7^{th} , 9^{th} , 14^{th}
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation method	Weights
1	Mid-term examination	10%
2	final examination	60%
3	Practical examination	10%
4	Semester work	20%
	Total	100%

8. List of References:

No.	Reference List
1	Gerhart, Philip M., Andrew L. Gerhart, and John I. Hochstein. Munson, Young and Okiishi's
	Fundamentals of Fluid Mechanics. John Wiley & Sons, 2016.
2	Schetz, J. A., & Fuhs, A. E. (Eds.). (2011). Fundamentals of fluid mechanics. John Wiley & Sons.





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3	Young, D. F., Munson, B. R., Okiishi, T. H., & Huebsch, W. W. (2010). A brief introduction
5	to fluid mechanics. John Wiley & Sons.

9. Facilities required for teaching and learning:

	Facility
1	Lecture classroom
2	Seminar
3	Computer lab.
4	White board
5	Data Show system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Fluid properties, fluid statics, kinematics	1	C1	a1, a2
2	Fluid Dynamics including Energy and Momentum equations	1	C1	al
3	Dimensional analysis, laminar flow, turbulent flow, and its applications	1	C1	al
4	forces on immersed bodies, introduction to compressible flow	4	C1	b1
5	Applications to filtration and fluidization	8	C1	b2, b3
6	Laboratory course in Fluid Mechanics includes experiments on venture-meter, friction losses in pipes	4, 8	C2	a2
7	Center of pressure, flow measuring apparatus, multi-pump test (Pump characteristics) and losses in piping systems	4, 8	C2	a1, b1

Course Coordinator: Assoc. Prof. Dr. Mohamed Gabr **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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Engineering Economy (ENG303)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Engineering Economy
Course Code	ENG303
Year/Level	Level 3
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre-request	-

Taaabing bourg	Lectures	Tutorial	Practical		
Teaching nours	2	1	-		

2. Course Aims:

No.	Aims
	Work in and manage a diverse team of professionals from various engineering disciplines,
2	taking responsibility for own and team performance; and behave professionally and adhere to
	engineering ethics and standards.
10	Demonstrate leadership qualities, business management, and skill development.

3. Competencies:

Competencies	Learning Outcomes (LO'S)				
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.	 a1 List the economic concepts related to characteristics in engineering analysis to improve the engineering process. a2 Recognize business and management principles relevant to engineering for replacement and depreciation of equipment to reduce the cost of operations. b1 Combine different ideas, views, and knowledge from a range of sources to evaluate the characteristics of project economic. c1 Assess economic, societal, and environmental dimensions and risk management in engineering design. 				
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	 a2 List the engineering-related economy. b1 Innovate economy methodical approaches when dealing with new and advancing technology. c2 Use fundamental economy organizational abilities. 				





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4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Basic concepts of engineering economy as applied to the evaluation of capital investment alternatives in both the private and public sectors of our economy	4	4	-
2	Attention is given to the time value of money by showing the concepts and techniques for evaluating the worth of products, systems, structures, and services in relation to their cost	6	4	-
3	Economic and cost concepts: calculating economic equivalence, comparison of alternatives and replacement economy	6	6	-
4	Deprecation and method used for calculating	6		-
5	Economic optimization in design and operations. Cost estimation of products and systems	6	4	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Basic concepts of engineering economy as applied to the evaluation of capital investment alternatives in both the private and public sectors of our economy	X	X			X									
Attention is given to the time value of money by showing the concepts and techniques for evaluating the worth of products, systems, structures, and services in relation to their cost	X	X			X	X								
Economic and cost concepts: calculating economic equivalence, comparison of alternatives and replacement economy	X	X			X		X							





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Deprecation and method used for calculating	X	X		X	X					
Economic optimization in design and operations. Cost estimation of products and systems	X	X		X		X				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed	Knowledge and skills transfer
2	of low, medium, and high-performance students.	among different level of students.

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid Term exam	C3	a1, a2
2	Semester work (quizzes, sheets, report)	C3	c1, a1
3	Final term examination	C3	a2, b1, c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work (quiz, report)	6^{th} , 11^{th}
2	Mid Term examination	8 th
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Engineering economic and financial accounting, A.R.Argasri and VVR McGraw-Hill,New
1	Delhi,2006
C	Leland Blank, Anthony Tarquin, "ENGINEERING ECONOMY", Published by McGraw-
2	Hill, ISBN 978-0-07-337630-1 (2018)
3	Engineering Economics Rajan Misra, University science press, New Delhi,2009

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system





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10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Basic concepts of engineering economy as applied to the evaluation of capital investment alternatives in both the private and public sectors of our economy	2	C3	al
2	Attention is given to the time value of money by showing the concepts and techniques for evaluating the worth of products, systems, structures, and services in relation to their cost	2	C3	al
3	Economic and cost concepts: calculating economic equivalence, comparison of alternatives and replacement economy	2	C3	a2
4	Deprecation and method used for calculating	2	C3	a2
5	Economic optimization in design and operations. Cost estimation of products and systems	2	C3	a2

Course Coordinator: Dr. Rania Hamdy & Dr. Hany Hashish **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>Numerical Methods in Engineering</u> (MTH302)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Numerical Methods in Engineering
Course Code	MTH302
Year/Level	Level 2
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing hours	Lectures	Lectures Tutorial			
Teaching nours	2	2	-		

2. Course Aims:

No.	Aims
1	Master a broad range of engineering knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying numerical theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.

3. Competencies:

Competencies	Learning Outcomes (LO'S)					
C1 Identify,	al Describe the relevant mathematical principles and theories in the					
formulate, and solve	discipline.					
complex engineering	a2 Explain the scientific principles and theories that apply to the topic.					
problems by	b1 Using math ideas and theories that are applicable to the field.					
applying	b2 Using scientific concepts and theories that are relevant to the profession.					
engineering	c1 solve complex engineering problems by -applying the concepts and the					
fundamentals, basic theories of mathematics.						
science, and	and c2 Identify complex engineering problems by applying the concepts and the					
mathematics.	theories of sciences, appropriate to the discipline.					

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Numerical solution of linear and nonlinear systems	4	4	-
2	Numerical differentiation and integration	6	6	-
3	Curve fitting and interpolation	10	10	-
4	Numerical solution of initial value problems	4	4	-
5	Boundary and Eigen value problems	4	4	_
	Total	28	28	_



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5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Numerical solution of linear and nonlinear systems					x	X								x
Numerical differentiation and integration					x	x								x
Curve fitting and interpolation					x	X								X
Numerical solution of initial value problems	x				x	X								X
Boundary and Eigen value problems	x				x	X								х

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

NT			TO			
No.	Evaluation Method	Competencies	LO's			
1	Midterm examination	C1	a1, a2, b1			
2	Semester work (quizzes, sheets, report)	C1	a2, c1, c2			
3	Final term examination	C1 b1, b2				
7.2 Ev	valuation Schedule:					
No.	Evaluation Method	Weeks				
1	Midterm examination	8	8 th			
2	Semester work	2 nd -7 th -	- 9 th -14 th			
3	Final term examination	1:	15 th			
7.3 W	eighting of Evaluation:					
No.	Evaluation Method		Weights			
1	Midterm examination 20%					
2	Semester work 20%					
3	Final term examination		60%			





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Total 100%

8. List of References:

No.	Reference List
1	Kiusalaas, Jaan. Numerical methods in engineering with Python 3. Cambridge university
	press, 2013.
2	B. S. Grewal "Numerical Methods in Engineering and Science" Mercury Learning and
	Information (2018).

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Presenter
3	White board
4	Data show system
5	Sound system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	Numerical solution of linear and nonlinear systems	1	C1	al
2	Numerical differentiation and integration	1	C1	a2
3	Curve fitting and interpolation	1	C1	b1
4	Numerical solution of initial value problems	1	C1	b2
5	Boundary and eigen value problems	1	C1	c1, c2

Course Coordinator: Dr. Samar Madian **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>Hydrology and Irrigation Engineering</u> (CIE305)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Hydrology and Irrigation Engineering
Course Code	CIE 305
Year/Level	Level 3
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG301

Teaching hours	Lectures	Tutorial	Practical		
reaching nours	2	2	-		

2. Course Aims

No.	Aims
4	Use the techniques, skills, and current engineering tools required for irrigation engineering practices
7	Achieve an optimum design of irrigation and drainage systems and the applications of hydrology.

3. Competencies:

Competencies	Learning Outcomes (LO'S)					
	a2 Explain the scientific principles, and					
	theories that apply to water resources and					
	Irrigation.					
C1 Identify formulate and solve complex	a3 Explain the basic principles of irrigation and					
engineering problems by applying engineering	drainage systems.					
fundamentals, basic science and mathematics.	b1 Estimating of water requirements for crops					
	and managing and distribution of irrigation					
	systems.					
	b2 Using scientific concepts and theories that					
	are relevant Crops, Soil and Water relation.					
	al Define basic characteristics, properties,					
	concepts, and techniques of Irrigation and					
	Drainage Engineering.					
C2 Develop and conduct appropriate simulation,	bl Conduct basic experiments to learn about					
analyze and interpret data, assess and evaluate	the basic characteristics and features of flow					
findings, and use statistical analyses and objective	types in open channels.					
engineering judgment to draw conclusions.	b2 Conduct basic experiments to learn about					
	the applications of Hydraulic, Hydrology and					
	fluid mechanics in the fields of Irrigation					
	Engineering and Canal Design.					





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C11 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.	 a1 Recognize the fundamentals of Irrigation Canal Design, Canal lining and Modern Irrigation Systems. c1 Using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of Irrigation Canal Design and Sprinkler and Trickle Irrigation parts.
C12 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.	b2 Achieve an optimum Planning and design of open channel for irrigation and drainage networks, and design modern irrigation systems (sprinkler and Trickle).

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
	Introduction – The concept of Irrigation and its importance			
1	– Stages of Development of Irrigation in Egypt – Irrigation	2	2	-
	Water Resources.			
2	Plant Relationship with Soil and Water.	2	2	-
3	Water Consumptive Use & Water Requirements for Crops.	3	3	-
4	Planning and Design of Irrigation and Drainage Networks.	4	4	-
5	Different Irrigation Methods	3	3	-
6	Surface Water Irrigation	2	2	-
7	Sprinkler Irrigation	4	4	-
8	Trickle Irrigation	4	4	-
9	Drainage Systems	4	4	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
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Introduction – The concept of Irrigation and its importance – Stages of Development of Irrigation in Egypt – Irrigation	x		x	x	x	x			x				
Water Resources.													
Plant Relationship with Soil and Water.	x		X	x	x	x			х				X
Water Consumptive Use & Water Requirements for Crops.	x		x	x	x				х		x	x	
Planning and Design of Irrigation and Drainage Networks.	x		x	x	x	x		х	х	x			
Different Irrigation Methods	X		Х	x	X	X		х	X	x			
Surface Water Irrigation	x		Х	x	X	x			Х		X		
Sprinkler Irrigation	x		Х	x	X	x	Х		Х	x			
Trickle Irrigation	x		Х	x	X	x	X		Х	x			
Drainage Systems	X		Х	x	X	X			X			x	

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material.	Better access any time.
2	Weekly communication with students.	Better communication with certain cases.
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different levels of students.
4	Electronic model system for the Institution.	Better access any time.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C1	a2, b1, b2
1	Mid-term examination	C2	a1, b1, b2
		C12	b2
	Semester work	C1	a2, a3, b1, b2
2		C2	a1, b1, b2
2		C11	a1, c1
		C12	b2
		C1	a2, b1, b2
4	Final term examination	C2	a1, b2
		C11	c1
		C12	b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	2 nd ,5 th , 7 th , 10 nd , 12 th , 14 th
2	Mid Term examination	8 th





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3	Final term examination	15 th
7.3 W	eighting of Evaluation:	
No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List							
1	Peter Waller and Muluneh Yitayew. (2015). "Irrigation and Drainage Engineering". springer.							
2	Dean E. Eisenhauer, Derrel L. Martin, et al. (2021). "Irrigation Systems Management". ASABE Puplications.							
3	Vijay P. Singh and Qiong So. (2022). "Irrigation Engineering: Principles, Processes, Procedures, Design, and Management". Cambridge University Press.							
4	محمد السلاوي و امير مباشر (2014). "هندسة الري والصرف". جامعة الأز هر.							

9. Facilities required for teaching and learning:

Facility							
1	Lecture classroom	3	White board				
2	Seminar	4	Data show system				

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's	
1	Introduction – The concept of Irrigation and its importance – Stages of Development of Irrigation in Egypt – Irrigation Water Resources	4	C1	a2, a3	
2	Plant Relationship with Soil and Water.	4	C1	b1. b2	
3	Water Consumptive Use & Water Requirements for Crops.	4	C1	b1, b2	
4	Planning and Design of Irrigation and Drainage Networks.	4	C2	a1, b1, b2	
5	Different Irrigation Methods	7	C11	al	
6	Surface Water Irrigation	7	C11	al	
7	Sprinkler Irrigation	7	C11 C12	c1, b2 b2	
8	Trickle Irrigation	7	C11 C12	c1, b2 b2	
9	Drainage Systems	7	C1 C2	a3 a1	

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Reinforced Concrete (1) (CIE306)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Reinforced Concrete (1)
Course Code	CIE306
Year/Level	Level 3
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG205

Taashing houng	Lectures	Tutorial	Practical
reaching nours	3	2	-

2. Course Aims

No.	Aims
	Master a broad range of engineering knowledge and specialized skills, as well as the ability to
1	apply acquired knowledge by applying theories and abstract thinking to identify, diagnose,
	and solve engineering problems of varying complexity and variation.
7	Achieve an optimum design of Reinforced Concrete.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a3 Explain the basic principles of engineering. c2 Practice the neatness and aesthetics in design to approach stresses in beams, torsional stresses
C2 Develop and conduct appropriate simulation, analyze, and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	 a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings, infrastructures. c3 Applying statistical analyses and objective engineering judgment to draw conclusions.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health, and safety requirements,	a1 Describe quality assurance systems, codes of practice, and standards
C11 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	c1 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.





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and techniques of: structural analysis and mechanics, properties and strength of materials, surveying, soil, machanics	
hydrology and fluid mechanics.	
C12 Achieve an optimum design of	
Reinforced Concrete.	b1 Achieve an optimum design of Reinforced Concrete

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Introduction, materials, properties	2	2	-
2	Design methods and requirements.	2	2	-
3	Load distribution	4	4	-
4	Bond length between concrete and steel bars	4	4	-
5	Loading analysis and design	4	4	-
6 Limit state design method (Flexural analysis and design,		4	4	-
	shear, and design, etc. Loading analysis and design)			
7 Design of Beams and design of solid slabs One- and two-		4	4	-
	way slabs			
8	Short columns	4	4	_
	Total	28	28	_

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Introduction, materials, properties	X				х	X		х						
Design methods and requirements.	X				х	X		х						
Load distribution	X				x	x		х						
Bond length between concrete and steel bars	x				x	x		x						
Loading analysis and design	X				x	х		х						
Limit state design method (Flexural analysis and design, shear, and design, etc. Loading analysis and design)	X				x	x		X						
Design of Beams and design of solid slabs One- and two-way slabs	x				x	x		x						
Short columns	x				х	x		x						







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6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason		
1	Presentation of the course in digital material	Better access any time		
2	Wed communication with students	Better communication with certain cases		
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students		
4	Electronic model system for the Institution.	E. learning		

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C2	a2
1	Mid-term examination	C4	a1, b1
		C12	b1
2	Semester work	C2	a2
		C4	al
		C12	b1
		C2	a2, c3
3	Final term examination	C4	al
		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	$2^{nd}, 7^{th}, 9^{th}$
2	Mid Term examination	8 th
3	Practical Examination	14 th
4	Final term examination	15 th

7.3 Weighting of Evaluation:No.Evaluation Method1Mid-term examination2Semester work3Final-term examination60%Total

8. List of References:

No.	Reference List
1	Course notes: Are delivered during the lecture, including handout materials such as solved
	problems, design charts, tables, etc.
2	Essential books (textbooks / design codes):
	Egyptian Code for Design and Construction of Reinforced Concrete Structures 2018.
	Design Aids and Examples in Accordance with the Egyptian Code for Design and Construction
	of Reinforced Concrete Structures 2018.

9. Facilities required for teaching and learning:

No.		Facility	
1	Lecture classroom		





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2	Seminar
3	White board
4	Data Show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction, materials, properties	1, 2, 7	C1	a3
2	Design methods and requirements.	1, 2, 7	C2	a2, c3
3	Load distribution	1, 2, 7	C2	a2
4	Bond length between concrete and steel bars	1, 2, 7	C2	a2, c3
5	Loading analysis and design	1, 2, 7	C2	a2, c3
	Limit state design method (Flexural analysis and	1, 2, 7	C2	a1, c3
6	design, shear and design, etc. Loading analysis		C4	al
	and design)		C12	b1
7	Design of Beams and design of solid slabs One-	1, 2, 7	C2	a1, c3
	and two-way slabs.		C4	al
8	Short columns	1, 2, 7	C2	a1, c3

Course Coordinator: Dr. Shady Ragheb **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Surveying (2)</u> (CIE307)

1. Basic Information:

Program Title	Civil Engineering Program	
Department Offering the Program	Civil Engineering Department	
Department Responsible for the Course	Civil Engineering Department	
Course Title	Surveying (2)	
Course Code	CIE307	
Year/Level	Level 3	
Specialization	Major – Compulsory Course	
Authorization Date of Course Specification	-	
Pre-request	CIE202	

Taaahing haung	Lectures	Tutorial	Practical
reaching nours	2	1	1

2. Course Aims:

No.	Aims
6	Analyze data from the intended tests to manage resources creatively
10	Select appropriate and sustainable technologies for civil engineering fields such as surveying.

3. Competencies:

Competencies	Learning Outcomes (LO'S)		
C1 Identify formulate and solve complex engineering	a2 Explain the scientific principles		
replams by applying angingering fundamentals basic	and theories that apply to the topic.		
problems by apprying engineering fundamentals, basic	b1 Using math ideas and theories		
science, and mathematics.	that are applicable to the field.		
C11 Select appropriate and sustainable technologies for	al Recognize the fundamentals of		
construction of buildings, infrastructures, and water	surveying.		
structures; using either numerical techniques or physical	c1 Using either numerical		
measurements and/or testing by applying a full range of civil	techniques or physical		
engineering concepts and techniques of structural analysis	measurements and/or testing by		
and mechanics, properties and strength of materials,	applying a full range of civil		
surveying, soil mechanics, hydrology and fluid mechanics.	engineering concepts and		
	techniques of surveying.		

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Indirect methods for distance measurement: Stadia method-tangent methods-substance bar.	2	1	1
2	Setting out of horizontal and vertical curves	4	2	2
3	Introduction to theory of errors and error analysis of surveying measurements. Computations of areas and volumes of earth work in construction sites.	6	3	3






4	Coordinate systems and transformations coordinate computations:	6	3	3
5	Modern methods for distance measurements: Distance measurement (EDM) and total stations.	4	2	2
6	Setting out of engineering projects.	2	1	1
7	Course Project	4	2	2
	Total	28	14	14

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Indirect methods for distance measurement:	x				x	x								x
Stadia method-tangent methods- substance bar.	x				x	x								x
Setting out of horizontal and vertical curves	x				x	x								x
Introduction to theory of errors and error analysis of surveying measurements. Computations of areas and volumes of earth work in construction sites.	x				x	х								x
C Coordinate systems and transformations coordinate computations: Polar method-intersection- resection	x				x	x								X
Modern methods for distance measurements: Distance measurement (EDM) and total stations.	X				x	X								X
Setting out of engineering projects.	x				x	x								x
Course Project	х				х	x								x





6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midtorm avamination	C1	a2
1		C11	al
2	Semester work (quizzes, sheets, report)	C10	d1, d2
2	Einel terms exemination	C1	a2, b1
3	Final term examination	C11	a1. c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks			
1	Semester work	2^{nd} - 7^{th} - 9^{th}			
2	Mid Term examination	8 th			
3	Practical examination	14 th			
4	Final term examination	15 th			

7.3 Weighting of Evaluation:

1.0 11					
No.	Evaluation method	Weights			
1	Mid-term examination	10%			
2	Semester work	20%			
3	Practical examination	10%			
4	Final-term examination	60%			
	Total 100%				

8. List of References:

No.	Reference List
1	Walker, J., and Awange, J. L. (2017) Surveying for Civil and Mine Engineers.
2	Wolf, P.R. and Brinker, R.C., Elementary Surveying, 10 th ed., Harper Collins College Publisher, NY, USA (2002)

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system
5	Lab





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10.	Matrix of knowledge and skills of the course:			
No	Торіс	Aims	Competencies	LO's
1	Indirect methods for distance measurement: Stadia method-tangent methods-substance bar.	1, 10	C1	a2, b1
2	Setting out of horizontal and vertical curves	1, 10	C1 C11	a2 a1, c1
3	Introduction to theory of errors and error analysis of surveying measurements. Computations of areas and volumes of earth work in construction sites.	1,10	C11	al
4	oordinate systems and transformations coordinate computations: Polar method-intersection-resection	1, 10	C1 C11	a2 a1
5	Modern methods for distance measurements: Distance measurement (EDM) and total stations.	1, 10	C1 C11	b1 C1
6	Setting out of engineering projects.	1, 10	C1 C11	a2, b1 a1, C1
7	Course Project	1, 10	C1 C11	a2, b1 a1, C1

Course Coordinator: Dr. Ayman Helal **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Traffic and Transportation Engineering</u> (CIE308)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Traffic and Transportation Engineering
Course Code	CIE308
Year/Level	Level 3
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taashing haung	Lectures	Tutorial	Practical	
reaching nours	2	1	-	

2. Course Aims

No.	Aims
1	Master a broad range of engineering knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.
6	Analyze data from the intended tests to manage resources creatively
7	Achieve an optimum design of Transportation and Traffic, Roadways and Airports, Railways, or any other emerging field relevant to the discipline.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	c2 Practice the neatness and aesthetics in design
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.	 a2 Define the principles and basic of traffic and transportation works and use the sustainable technologies. b2 Conduct basic experiments to learn about transportation and traffic or other emerging field relevant to the discipline. b3 Analyze and interpret data. c3 Applying statistical analyses and objective engineering judgment to draw conclusions.
C11 Select appropriate and sustainable technologies for road construction	a2 Summarize, appropriate and sustainable technologies for road construction
C12 Achieve an optimum design for Transportation and Traffic, Roadways,	b2 Achieve an optimum design of works for transportation and traffic or any other emerging field relevant to the discipline.





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or any other emerging field relevant to	
the discipline.	

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Measures of flow, speed, and Density	2	2	-
2	Statically of traffic characteristics (travel time, delay,	2	2	-
2	speed, pedestrians, parking, and accident studies			
3	Traffic signals	2	2	-
4	Parking garages and terminals design	2	2	-
5	Freeway surveillance and control	2	2	-
	General characteristics of transportation: streets,	2	2	-
6	highways, rail, transit, water, and pipelines. Egypt			
	transport system: on overview			
7	Fundamentals of traffic flow: time space diagrams,	2	2	-
/	capacity analysis			
8	control, IVHS, public issues and administration	4	4	-
	Transport system design: characteristics of driver, vehicle,	2	2	-
9	and road. Route location, horizontal, an. Vertical			
	alignment, earthwork, drainage, and pavements			
10	Economic evaluation, system operation, maintenance, and	4	4	-
10	rehabilitation			
	Environmental impacts, various laboratory experiments	4	4	-
11	and design projects			
	supplement the subject matter			
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Measures of flow, speed, and Density		x			x	x								x
Statically of traffic characteristics (travel time, delay, speed, pedestrians, parking, and accident studies		X			X	X								X
Traffic signals		X			x	X								X





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	 		-	-	-	-		 	
Parking garages and terminals design	x		х	x					x
Freeway surveillance and control	x		X	X					x
General characteristics of transportation: streets, highways, rail, transit, water, and pipelines. Egypt transport system: on overview	x		X	х					X
Fundamentals of traffic flow: time space diagrams, capacity analysis	x		x	x					x
control, IVHS, public issues and administration	x		x	x					x
Transport system design: characteristics of driver, vehicle, and road. Route location, horizontal, an. Vertical alignment, earthwork, drainage, and pavements	x		х	х					х
Economic evaluation, system operation, maintenance, and rehabilitation	X		x	x					x
Environmental impacts, various laboratory experiments and design projects supplement the subject matter	x		X	X					X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midtown avanination	C2	a2, b2
1		C12	b2
2	Semester work (quizzes, sheets, report)	C2	a2, c3
2	Final tame avamination	C2	a2, b2, c3
3	r mai term examination	C11	a2





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		C12	b2						
7.2 Evaluation Schedule:									
No.	Evaluation Method		Weeks						
1	Midterm examination		8 th						
2	Semester work		7^{th} - 9^{th}						
3	Final term examination		15 th						
7.3 W	eighting of Evaluation:								
No.	Evaluation Method		Weights						
1	Midterm examination		20%						
2	Semester work		20%						
3	Final term examination		60%						
	Total		100%						

8. List of References:

No.	Reference List
1	Khisty C. J. and Lall B. K., Transportation Engineering - An Introduction, 3rd Edition,
1	Prentice-Hall, Inc., New Jersey, USA, 2018.
C	Wright, P. H. and Dixon K. K., Highway Engineering, 7th Edition, John Wiley & Sons, Inc.,
2	2016.
2	Tom V. M., (2017) lecture notes in traffic engineering and management. Department of civil
3	engineering, Bombay.

9. Facilities required for teaching and learning:

	Facility							
1	Lecture classroom	3	White board					
2	Seminar	4	Data show system					

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Measures of flow, speed and Density	1,7	C2	a2
2	Statically of traffic characteristics (travel time, delay, speed, pedestrians, parking and accident studies	1,7	C2	a2 c3
3	Traffic signals	1,7	C2 C12	a2, b2 b2
4	Parking garages and terminals design	1,7	C2 C12	a2 b2
5	Freeway surveillance and control	1,7	C2 C12	a2, c3 b2
6	General characteristics of transportation: streets. And highways, rail, transit, water, and pipelines. Egypt transport system: on overview.	1, 7	C2 C11	a2, c3 a2
7	Fundamentals of traffic flow: time space diagrams, capacity analysis	1,7	C2	a2 b3 c3
8	control, IVHS, public issues and administration	1, 7	C2	a2





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				b2
9	Transport system design: characteristics of driver, vehicle, and road. Route location, horizontal, and vertical alignment, earthwork, drainage, and pavements	1, 7	C2 C11 C12	a2, b2, c3 a2 b2
10	Economic evaluation, system operation, maintenance, and rehabilitation	1,7	C2	a2 b2
11	Environmental impacts, various laboratory experiments and design projects supplement the subject matter	1,7	C2	a2 b2

Course Coordinator: Assoc. Prof. Dr. Alaa Gabr **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022







<u>Technical Report Writing</u> (ENG207)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Technical Report Writing
Course Code	ENG207
Year/Level	Level 2
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taaahing hours	Lectures	Tutorial	Practical		
Teaching nours	1	-	2		

2. Course Aims:

No.	Aims
	Communicate effectively with a variety of audiences using a variety of forms, methods, and
5	languages; cope with academic and professional issues in a critical and creative manner; and
	display leadership, business administration, and entrepreneurial abilities.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C5 Practice research techniques and methods of investigation as an inherent part of learning.	 a1 Define technical language and report writing. b1 Assess different ideas, views, and knowledge from a range of sources. c1 Prepare technical reports. d1 Search for information to engage in lifelong self-learning discipline.
C8 Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1 Communicate effectively.d2 Demonstrate efficient IT capabilities.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
	Introduction to technical writing.			
	Define a report, Types of reports, Aim.			
1	Common concepts: clarity of Writing, Consistency	2	-	-
	Supporting Material			
	Language rules (voice, tense) and Style			
2	Common components of a technical report	2		
2	Organization of report sections	2	-	-







	Section's function and content			
	How to write a technical report			
	Identify layout, Determine Audience			
3	Assign reference, add non text component.	2	-	-
	Mechanics of report writing.			
	Quantitative Writing			
4	Equations, Tables and Figures	1	-	-
5	Literature citations	1	-	-
6	Using word processing for Writing Report	1	-	8
7	Creating slides with presentation graphics programs	1	-	4
8	MS Excel Application and power view report command	2	-	8
9	Database Report using MS SQL	2	-	8
	Total	14	-	28

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Introduction to technical writing. Define a report, Types of reports, Aim. Common concepts: clarity of Writing, Consistency Supporting Material Language rules (voice, tense) and Style	х	X		X	X	X	X							X
Common components of a technical report Organization of report sections Section's function and content	x	x		X	X	X	X							X
How to write a technical report Identify layout, Determine Audience Assign reference, add non text component. Mechanics of report writing. Quantitative Writing	X	X		X	X	X	X							X
Equations, Tables and Figures	Х	Х		Х	Х	Х	Х							X





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Literature citations	x	x	X	x	x	X				X
Using word processing for Writing Report	x	x	x	x	x	x				х
Creating slides with presentation graphics programs	x	x	x	x	x	x				x
MS Excel Application and power view report command	x	x	x	x	x	x				X
Database Report using MS SQL	x	x	x	X	X	x				X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Web communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C5	al
2	Semester work (quizzes, sheets, report, presentation)	C5, C8	c1, d1, d2
3	Practical Examination	C5, C8	c1, d1, d2
4	Final term examination	C5, C8	b1, a1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	2 nd ,7 th ,9 th ,13 th
3	Practical Examination	14 th
4	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation method	Weights
1	Mid-term examination	10%
2	final examination	60%
3	Practical examination	10%
4	Semester work	20%
	Total	100%

8. List of References:

No.	Reference List
1	How to write technical report, 2010 by lutezhering.
	Lindsell-Roberts, Sheryl. Technical writing for dummies. John Wiley & Sons, 2023.

9. Facilities required for teaching and learning:

No.	Facility





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1	Lecture classroom
2	Presenter
3	Computer lab.
4	White board
5	Data show system
6	Wireless internet
7	Sound system

10. Matrix of Competencies and LO's:

No	Торіс	Aims	Competencies	LO's
1	Introduction to technical writing	5	C5	al
2	Common components of a technical report	5	C5	al
3	How to write a technical report	5	C5	c1
4	Equations, Tables and Figures	5	C5	al
5	Literature citations	5	C5	b1, d1
6	Using word processing for Writing Report	5	C5	b1
7	Creating slides with presentation graphics programs	5	C8	d1, d2
8	MS Excel Application and power view report command	5	C8	d1, d2
9	Database Report using MS SQL	5	C5	b2

Course Coordinator: Dr. Mohamed Elbindary & Dr. Hany Hashish **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>Open Channel Hydraulics</u> (CIE401)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Open Channel Hydraulics
Course Code	CIE401
Year/Level	Level 4
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG301

Taaahing haung	Lectures	Tutorial	Practical		
reaching nours	2	1	1		

2. Course Aims

No.	Aims
1	Master a broad range of engineering knowledge and specialized skills by applying theories and thinking to identify and solve engineering problems regarding to the applications of open
	channel hydraulics.
7	Achieve an optimum design for nonuniform flow, gradually varied flow, and rapidly varied
/	flow.
10	Select appropriate and sustainable technologies for open channel hydraulics best hydraulic
10	section, gradually varied flow, rapidly varied flow and hydraulic machines (pump).

3. Competencies:

Competencies	Learning Outcomes (LO'S)					
C2 Develop and conduct appropriate	a2 Define the principles, basic properties, and features of open					
simulation, analyze, and interpret	channel flow, specific energy, specific force, surface water					
data, assess and evaluate findings, and	profiles for water structures, Turbines and Pumps.					
use statistical analyses and objective	c2 Conduct basic experiments to learn about the basic					
engineering judgment to draw	characteristics and features of flow types in open channels,					
conclusions.	hydraulic jump.					
C12 Achieve an optimum design of	b1 Achieve an optimum design for nonuniform flow in open					
open channel flow hydraulics, and	channel.					
surface water profiles related to	b2 Achieve an optimum design for rapidly varied flow,					
hydraulic structures and water	gradually varied flow in open channel, pumps, and turbines.					
resources.						

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Introduction – review (pipelines hydraulics)	2	-	2
2	Principles of hydraulics of open channel flow	4	-	4
3	Critical flow - velocity distribution - unsteady flow	4	-	4







4	Energy approach Practical: [Hump + Depression]	6	-	6
5	Momentum approach – rabidly varied flow Practical: [Hydraulic jump]	4	-	4
6	Surface roughness	2	-	2
7	Gradually varied flow Practical: [G.V.F]	2	-	2
8	Hydraulic machines (pump) – Best hydraulic section	4	-	4
	Total	28	-	28

5. Teaching and learning methods:

Topics	Face-to-face lecture	On line lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site Visits	Self learning and Research	Cooperative	Discovering	Modeling	Lab
Introduction -review (Pipelines hydraulics)	X				X	х	Х							x
Principles of hydraulics of open channel flow	X				X	x	Х							х
Critical flow – velocity distribution – unsteady flow equations	х				X	x	Х							x
Energy approach Practical: [Hump + Depression]	x				х	x	Х							x







Momentum approach – rabidly varied flow Practical: [Hydraulic jump]	x		x	x	х				x
Surface roughness	х		х	х	Х				х
Surface roughness Gradually varied flow	х		X	X	Х				x
Hydraulic machines (pump) – Best hydraulic section	x		x	X	X				x

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high- performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid term examination	C2	a2
1	Wid-term examination	C12	b1
2	Semester work	C2	a2, c2
		C12	b1, b2
3	Practical Examination	C2	c2
4	Final term examination	C2	a2
		C12	b1, b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work	2 nd ,7 th , 9 th
2	Mid Term examination	8 th
3	Practical Examination	14^{th}
4	Final term examination	15 th







7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights	
1	Mid-term examination	10%	
2	Semester work	20%	
3	Practical Examination	10%	
4	Final-term examination	60%	
	Total 100%		

8. List of References:

No.	Reference List
1	Khurmi, R.S. (2018). " A textbook of hydraulics, fluid mechanics and hydraulic machines" S.
	Chanel and company Ltd. P.990
2	Subramanya, K. (2018 "Flow in open channels" McGra- Hill Education (India). P.602
3	Glenn E. Moglen. 2019. Fundamentals of Open Channel Flow. CRC Press. Available on
	Taylor & Francis eBooks.

9. Facilities required for teaching and learning:

Facility			
1	Lecture classroom	3	White board
2	Seminar	4	Data show system
5	Lab.		

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competenci es	LO's
1	Introduction – review (Pipelines hydraulics)	7	C2	a2
2	Principles of hydraulics of open channel flow	1	C2 C12	a2 b1, b2
3	Critical flow – velocity distribution – unsteady flow equations	1	C12	b1, b2
4	Energy approach Practical: [Hump + Depression]	7	C12	b1, b2
5	Momentum approach – rabidly varied flow Practical: [Hydraulic jump]	7	C2 C12	a2, c1 b1
6	Surface roughness	10	C2 C12	a2, c1 b1
7	Surface roughness Gradually varied flow	7	C2 C12	a1, b1 b1
8	Hydraulic machines (pump) – Best hydraulic section	10	C2 C12	a2 b1

Course Coordinator: Assoc. Prof. Dr. Mohamed Gabr **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Steel Structures Design (1)</u> (CIE402)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Steel Structures Design (1)
Course Code	CIE402
Year/Level	Level 4
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	CIE202

Taaahing hours	Lectures	Tutorial	Practical
reaching nours	3	2	-

2. Course Aims:

No.	Aims
	Master a broad range of engineering knowledge and specialized skills, as well as the ability
1	to apply acquired knowledge in real-world situations by applying theories and abstract
I	thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering
	problems of varying complexity and variation.
7	Achieve an optimum design of steel structures
	Select appropriate and sustainable technologies for construction of steel buildings.
10	using numerical techniques, experiment measurements, and testing by applying a full range
	of civil engineering fields.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
	a3 Explain the basic principles of
	engineering in steel structures design.
C1 Identify, formulate, and solve complex	b3 Applying engineering basics that are
engineering problems by applying engineering	relevant to the steel structures design.
fundamentals, basic science, and mathematics.	c3 Identify, formulate, and solve complex
	engineering problems by applying
	engineering fundamentals.
	al Define, basic characteristics, properties,
C2 Develop and conduct appropriate	concepts, and techniques of structural
experimentation and/or simulation, analyze and	analysis and mechanics, and properties and
interpret data, assess, and evaluate findings, and use	strength of materials of steel structures.
statistical analyses and objective engineering	c3 Applying statistical analyses and
judgment to draw conclusions.	objective engineering judgment to draw
	conclusions.





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C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d3 Refer to relevant literatures.
C11 Select appropriate and sustainable technologies for construction of steel buildings 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, and properties and strength of materials.	 a1 Recognize the fundamentals of structural analysis and mechanics, and properties and strength of materials of steel structures. c1 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, and properties and strength of materials of steel structures.
C12 Achieve an optimum design of steel structures.	b1 Achieve an optimum design of steel structures.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Types of steel structures.	4	2	-
2	Types of loads on steel structural building.	4	2	-
3	Method of Design of steel structural buildings. (ASD - LRFD. Methods)	6	4	-
4	Allowable stress in different steel structural buildings.	4	2	-
5	Design of tension members, according to ASDM.	4	2	
6	Design of Compression members, according to ASDM.	4	4	
7	Design of bolted connections in trusses	4	2	
8	Design of welded connections in trusses	4	4	
9	Design of columns under axial loads.	4	4	-
10	General review of the course	4	2	_
	Total	42	28	_

5. Teaching and learning methods:

No.	Topics	Lecture	Tutorial	Practical
1	Introduction: Types of steel structures. Planning & general layout of steel structures.	6	4	-
2	Types of loads on steel buildings.	3	2	-
3	Methods of design of steel structural buildings: Allowable stress design method (ASD). Load and resistance factored design (LRFD). Allowable stresses in different steel members.	3	2	-
4	Design of truss members: Tension members. Compression members.	6	4	-
5	Design of truss connections: Bolted connections. Welded connections.	6	4	





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6	Design of beams: principles & applications on: Roof purlins. Floor beams. Built-up plate girder.	12	8	-
7	Design of beam-columns.	6	4	
	Total	42	28	-

6. Teaching and learning methods for disabled students:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and	Cooperative	Discovering	Modeling	Lab
1- Introduction:														
Types of steel structures.Planning & general layout of steel structures.	х			x	х					х				х
2- Types of loads on steel buildings.	x			x	x									x
 3- Methods of design of steel structural buildings: Allowable stress design method (ASD). Load and resistance factored design (LRFD). Allowable stresses in different steel members. 	x			x	x									x
4- Design of truss members:- Tension members.- Compression members.	x			x	X									x
5- Design of truss connections:- Bolted connections.- Welded connections.	x			x	X									x
6- Design of beams: principles & applications on:- Roof purlins.- Floor beams.- Built-up plate girder.	x			x	x									x
7- Design of beam-columns.	х			х	х									x

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C1	a3, b3, c3
1	Midtorm avamination	C2	a1, c3
1		C11	a1, c1
		C12	b1
2	Semester work (quizzes, sheets, report)	C1	a3, b3, c3





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		C2	a1, c3
		C9	d3
		C11	a1, c1
		C12	b1
		C1	a3, b3, c3
2	Final term exemination	C2	a1, c3
3		C11	a1, c1
		C12	b1

7.2 Evaluation Schedule:

· •= -=							
No.	Evaluation Method	Weeks					
1	Midterm examination	8 th					
2	Semester work	continuous evaluation					
3	Final term examination	15 th					

8. List of References:

No.	Reference List
	Course notes:
1	Lecture notes prepared by the course coordinator.
	Solved examples.
	Essential books (textbooks):
2	Egyptian Code of Practice for Steel Construction and Bridges (ASD), Code No. 205, HBRC,
	2003.
	Recommended books
3	E. B. Machaly, "Behavior, analysis and design of structural steel element", vol. 1, 2019.
	E. B. Machaly, "Behavior, analysis and design of steel work connections", vol. 3, 2019.
	Periodicals, Web sites, etc.
1	www.steelconstruction.org
4	www.modernsteel.com
	www.berlinsteel.com

9. Facilities required for teaching and learning:

	Facility						
1	Seminar	3	teaching aids as interactive (smart) board				
2	discussions rooms with internet connections	4	Data Show				

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction: Types of steel structures. Planning & general layout of steel structures.	1,10	C1, C9	a3, b3 d3
2	Types of loads on steel buildings.	1,10	C2, C11	a1, c3 a1, c1
3	Methods of design of steel structural buildings: Allowable stress design method (ASD). Load and resistance factored design (LRFD). Allowable stresses in different steel members.	1,10	C1, C2, C11	c3 a1, c3 a1, c1



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	Design of truss members:		C1,	c3
4	Tension members.	1,7	C11,	c1
	Compression members.		C12	b1
	Design of truss connections:		C1,	c3
5	Bolted connections.	1,7	C11,	c1
	Welded connections.		C12	b1
6	Design of beams: principles & applications on: Roof purlins. Floor beams. Built-up plate girder.	1,7	C1, C11, C12	c3 c1 b1
7	Design of beam-columns.	1,7	C1, C11, C12	c3 c1 b1

Course Coordinator: Assoc. Prof. Dr. Ashraf Elsabagh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Reinforced Concrete (2) (CIE403)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Reinforced Concrete (2)
Course Code	CIE403
Year/Level	Level 4
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	CIE306

Taashing houng	Lectures	Tutorial	Practical
reaching nours	3	2	-

2. Course Aims:

No.	Aims
7	Achieve an optimum design of Reinforced Concrete.

3. Competencies:

Competencies	Learning Outcomes (LO'S)				
C2 Develop and conduct appropriate simulation, analyze, and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	 a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings, infrastructures, and water structures. c3 Applying statistical analyses and objective engineering judgment to draw conclusions. 				
C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d1 Think creatively in solving problems of design.d3 Refer to relevant literatures.				
C12 Achieve an optimum design of	b1 Achieve an optimum design of Reinforced				
Reinforced Concrete.	Concrete				

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Introduction	3	2	-
2	Design of Hollow Block and Ribbed slabs	6	4	-
3	Design of sections subjected to Torsion	6	4	-
4	Design of flat slabs	9	6	-
5	Design of Stairs	9	6	-
6	Design of paneled beams	6	4	-
7	Deflection	3	2	-
	Total	42	28	-





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5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self - learning and Research	Cooperative	Discovering	Modeling	qel
Introduction	x				x	x		Х						
Design of Hollow Block and Ribbed slabs	x				x	x		x						
Design of sections subjected to Torsion	X				x	x		X						
Design of flat slabs	x				x	x		x						
Design of Stairs	x				x	x		Х						
Design of paneled beams	x				x	x		х						
Deflection	x				x	x		х						

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason		
1	Presentation of the course in digital material	Better access any time		
2	Wed communication with students	Better communication with certain cases		
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students		
4	Electronic model system for the Institution.	E. learning		

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid-term examination	C2 C9	a2, c3 d1
2	Semester work	C2 C12	a2 b1
3	Final term examination	C2 C9 C12	a2, c3 d1 b1





7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	$2^{nd}, 7^{th}, 9^{th}$
2	Mid Term examination	8 th
3	Practical Examination	14 th
4	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	EL-Metwally, S.E., and Hosny, H.M.H., "Design Fundamental of Structure Concrete." 1977
	Ministry of Housing. Utilities and Urban Communities, "Egyptian Code for Design and
	Construction of Reinforced Concrete Structures (ECCS203-2020)."Cairo 2020.
	Hilal.M., "Reinforced Concrete Fundamentals." Marcou, 1975 Books
	Hilal M., "Design of Reinforced Concrete Halls," Marcou 1981. Nassef, M.A.,"
2	Reinforced Concrete Design," Cairo Univ., 1988.Abdel Rahman, A., "Fundamental of
2	Reinforced Concrete Incorporating the Egyptian Code of 1989."
	Design Aids and Examples in Accordance with the Egyptian Code for Design and
	Construction of Reinforced Concrete Structures 2018.

9. Facilities required for teaching and learning:

No.			Facility
1	Lecture classroom	3	White board
2	Seminar	4	Data Show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction	7	C2	a2, c3
1	Introduction	/	C9	d1
2	Design of Hollow Plock and Pibbod slabs	7	C2	a2, c3
2	Design of Honow Block and Ribbed stabs		C12	b1
2	Design of sections subjected to Terrien	7	C9	d1
3	Design of sections subjected to Torsion		C12	b1
			C2	a2, c3
4	Design of flat slabs	7	C9	d1
			C12	b1
			C2	a2, c3
5	Design of Stairs	7	С9	d1
	C		C12	b1





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6	Design of paneled beams	7	C2 C9	a2, c3 d1
7	Deflection	7	С9	d1

Course Coordinator: Dr. Hamdy Abd Elaty **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Geology and Soil Mechanics (1)</u> (CIE404)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Geology and Soil Mechanics (1)
Course Code	CIE404
Year/Level	Level 4
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Taashing houng	Lectures	Tutorial	Practical		
reaching nours	2	1	1		

2. Course Aims:

No.	Aims
1	Master a broad range of engineering knowledge and specialized skills, as well as the ability
	thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.
10	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using numerical techniques, experiment measurements, and testing by applying a full range of civil engineering fields such soil mechanics.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a3 Explain the basic principles of engineering in geology and soil mechanics. b3 Applying engineering basics that are relevant to geology and soil mechanics. c3 identify, formulate, and solve complex engineering problems by applying geology and soil mechanics fundamentals.
C2 Develop and conduct appropriate experimentation, analyze, and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering	 a1 Define, basic characteristics, properties, concepts, and techniques of soil mechanics. b1 Conduct basic experiments to learn about the basic characteristics and features of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology and fluid mechanics.





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C6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements	 b1 interpret data derived from laboratory observation from equipment flow sheets, charts and curves to interpret data derived from laboratory observation. c1 Conduct experimental work related to the reinforced concrete and steel structures, foundations and earth retaining structures
C11 Select appropriate and sustainable technologies 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	 a1 Recognize the fundamentals of soil mechanics. c1 Using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of soil mechanics.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Introduction and basics of Geology	2	2	-
2	Basic geological properties of rocks	2	2	-
	Basic engineering properties of soils			
3	Practical: water content – specific gravity – sieve analysis	12	12	Δ
5	- hydrometer - Casagrande - sand cone test - standard	12		т
	proctor – modified proctor test			
4	Permeability and Seepage	4	4	2
5	Effective stresses and pore water pressure	2	2	-
	Stresses and strains in continuous body and shear stress of			
6	soil	2	2	4
	Practical: un-confined test			
7	Consolidation: Practical: oedometer	2	2	4
8	Stability analysis	2	2	_
	Total	28	28	14

5. Teaching and learning methods:





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Introduction and basics of Geology	x	X	X	X	x				x
Basic geological properties of rocks	x	x	X	x	x				x
Basic engineering properties of soils Practical: water content – specific gravity – sieve analysis – hydrometer – Casagrande – sand cone test – standard proctor – modified proctor test	x	x	X	х	х				X
Permeability and Seepage	x	x	X	x	x				x
Effective stresses and pore water pressure	x	x	x	x	x				x
Stresses and strains in continuous body and shear stress of soil Practical: un-confined test	x	x	X	x	x				X
Consolidation Practical: oedometer	x	x	x	x	x				x
Stability analysis	x	x	x	x	x				x

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C1	a3, b3, b3
1	Mid-term examination	C2	a1, b1
		C11	a1, c1
2	Somostor work	C1	a3, b3, b3
2	Semester work	C11	a1, c1
3	Practical Examination	C11	a1, c1







	Final term examination	C1	a3, b3, b3
4		C2	a1, b1
4		C6	b1, c1
		C11	a1, c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks	
1	Semester work	continuous evaluation	
2	Mid Term examination	8 th	
3	Practical Examination	14 th	
4	Final term examination	15 th	

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	10%
2	Semester work	20%
3	Practical Examination	10%
4	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
	Course notes:
1	Lecture notes prepared by the course coordinator + solved examples.
	Practical notes prepared by the course coordinator
2	Das, B., M. (2017), "Principles of geotechnical Engineering " Eighth Edition, CENGAGE
	Learning,
3	Knappett, J.A. and Craige R. F. (2012), "Craig's Soil Mechanics" Eighth Edition, Spon Press.
4	Essential books (textbooks):
	Egyptian Code of Practice for Soil Mechanics and Foundations (2002)

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction and basics of Geology	1	C1	a3, b3, b3
2	Basic geological properties of rocks	1,10	C2 C11	a1, b1 a1, c1
3	Basic engineering properties of soils Practical: water content – specific gravity – sieve analysis – hydrometer – Casagrande – sand cone test – standard proctor – modified proctor test	1,10	C2 C11	al, bl al, cl





			C1	a3,b3,b3
4	Permeability and Seepage	1 10	C2	a1,b1
-		1,10	C6	b1,c1
			C11	al, cl
	Effective stresses and pore water pressure		C1	a3,b3,b3
5		1 10	C2	a1,b1
3		1,10	C6	b1,c1
			C11	a1, c1
	Stresses and strains in continuous body and shear stress of soil Practical: un-confined test		C1	a3,b3,b3
6		1 10	C2	a1,b1
0		1,10	C6	b1,c1
			C11	a1, c1
		1,10		
			C1	a3,b3,b3
7	Consolidation Practical: oedometer		C2	a1,b1
/			C6	b1,c1
			C11	a1, c1
		1,10	C1	a3,b3,b3
8	Stability analysis		C2	a1,b1
			C6	b1,c1
			C11	a1, c1

Course Coordinator: Dr. Hany Hashish. **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Project Management and Control (ENG402)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Civil engineering Department
Department Responsible for the Course	Basic science and Engineering Department
Course Title	Project Management and Control
Course Code	ENG402
Year/Level	Level 4 – Semester 1
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	-

Teaching Hours	Lectures	Tutorial	Practical	
reaching nours	1	2	-	

2. Course Aims:

No.	Aims
6	Analyze data from the intended tests to manage resources creatively.
 Plan and manage construction processes; address construction defects, instability, and q issues; maintain safety measures in construction and materials; and assess the environn impacts of projects. 	
9	Deal with biddings, contracts, and financial issues including project insurance and guarantees.

3. Competencies:

Competencies	Learning Outcomes (LOs)		
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.	 b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. c2 Applying engineering design procedures to generate cost-effective solutions while adhering to sustainable design and development principles and contexts. 		
C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d2 Effectively manage tasks, time, and resources.		
C13 Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.	a1 Define the plan and manage the construction process.		





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	a1 Define biddings, contracts, and financial issues.		
C14 Deal with biddings, contracts, and	b1 Address biddings, contracts, and financial		
financial issues including project insurance	issues including project insurance and guarantees.		
and guarantees.	c1 Apply biddings, contracts, and financial issues		
	on civil engineering projects.		

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Development, Negotiation, and Specification of The Project Contract	2	4	-
2	Project Planning and Control Using Activity Network Models	2	4	-
3	Network Logic, Scheduling	4	8	-
4	Resource Allocation, Multi-Project Resource Allocation and Leveling Using Available Industrial Software	4	8	-
5	Time-Cost Trade-off Methods	2	4	-
	Total	14	28	-

5. Teaching and Learning Methods:

No ·	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Development, Negotiation, and Specification of The Project Contract		\checkmark			\checkmark									
2	ProjectPlanningandControlUsingActivityNetworkModels	\checkmark					\checkmark								
3	Network Logic, Scheduling	\checkmark			\checkmark										
4	ResourceAllocation,Multi-ProjectResourceAllocationandLevelingUsing AvailableIndustrialSoftware		\checkmark						\checkmark						
5	Time-Cost Trade-off Methods						\checkmark								

6. Teaching and Learning Methods for Disabled Students:







No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases
3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C3	b1, c2
1	Semester Works (Quizzes, Sheets, Reports)	С9	d2
1		C13	al
		C14	a1, b1, c1
		С9	d2
2	Mid-Term Exam	C13	al
		C14	a1, b1, c1
		C3	b1, c2
3	Final-Term Exam	C9	d2
		C13	al
		C14	a1, b1, c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks		
1	Semester Works (Quizzes, Sheets, Reports)	$4^{\rm th}, 11^{\rm th}$		
2	Mid-Term Exam	8 th		
3	Final-Term Exam	15^{th}		
7.3 Weighting of Evaluation:				
No	Evaluation Mathad	Waights		

N0.	Evaluation Nethod	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
	Total	100%

8. List of References:

No.	Reference List			
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and			
1	Development. Chartered Institute of Building (Great Britain), 2014.			
2	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,			
2	Scheduling, and Control, 1979.			
de Marco, A. Project Management for Facility Constructions A Guide for Eng				
Architects, 2011.				
4	Project Management Institute and Project Management Institute. A Guide to the Project			
4	⁴ Management Body of Knowledge (PMBOK Guide), 1996.			
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,			
3	Construction, and Manufacturing Projects to PMI, APM, and BSI Standards, 2006.			





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6 Vanhoucke, M. Management for Professionals Integrated Project Management and Control.

9. Facilities Required for Teaching and Learning:

Facility					
1	Lecture Classroom	3	White Board		
2	Seminar	4	Data Show System		

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
1	Development, Negotiation, and Specification of The Project Contract	9	C14	a1, b1, c1
2	Project Planning and Control Using Activity Network Models	6, 8	C9 C13	d2 a1
3	Network Logic, Scheduling	6, 8	C9 C13	d2 a1
4	Resource Allocation, Multi-Project Resource Allocation and Leveling Using Available Industrial Software	6, 8	C3	b1, c2
5	Time-Cost Trade-off Methods	6, 8	C3 C9	b1, c2 d2

Course Coordinator: Dr. Hamdy Abd Elaty **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>Computer Applications in Civil Engineering</u> (CIE405)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Computer Applications in Civil Engineering
Course Code	CIE405
Year/Level	Level 4
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG201

Taashing houng	Lectures	Tutorial	Practical
reaching nours	2	-	2

2. Course Aims

No.	Aims
	Achieve the optimum design of reinforced concrete and steel structures, hydraulic applications
7	(such as gradually and rapidly varied flow – channel cross-section) and sanitary works (such
	as water distribution system) using computer applications.
10	Select appropriate and sustainable technologies to design buildings, infrastructures and water
10	structures; using numerical techniques, and computer applications.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C2 Develop and conduct appropriate simulation, analyze and interpret data, assess and evaluate findings, and use statistical for computer applications in civil engineering.	 a1 Define, basic characteristics, properties, concepts, and techniques to design reinforced concrete and steel structures, hydraulic applications (such as gradually and rapidly varied flow – channel cross-section) and sanitary works (such as water distribution system). c1 Choose relevant mathematical and computer-based methodologies for problem modelling and analysis in civil engineering.
C11 Select appropriate and sustainable technologies to design reinforced concrete and steel structures, hydraulic applications and sanitary works using either numerical technique and design software programs.	c1 Using software programs (MATLAB or SAP 2000, Excel, EPANET) to design reinforced concrete and steel structures, hydraulic applications (such as gradually and rapidly varied flow – channel cross-section) and sanitary works (such as stormwater network and water distribution system).

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Study of theoretical models for the analysis of structures. Practical: analyze beams, frames, trusses and slabs	4	-	4





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2	Study of how to choose suitable methods for analysis of various structures. Practical: choose suitable methods for designing beams, frames, trusses and slabs	4	-	4
3	Preparation of simple programs based on these models. Practical: design programs for structure analysis using excel or MATLAB	4	-	4
4	Study of available programs and modifying them for analysis of certain problems. Practical: solving some hydraulic problems	6	-	6
5	Training on the use of available commercial software programs. Practical: using SAP 2000, Excel, and EPANET	6	-	6
6	Computer applications. Practical: choosing a civil engineering case	4	-	4
	Total	28	-	28

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Study of theoretical models for the analysis of structures. Practical: analyze beams, frames, trusses and slabs	X				X	X		X						X
Study of how to choose suitable methods for analysis of various structures. Practical: choose suitable methods for designing beams, frames, trusses and slabs	X				X	X		X						X
Preparation of simple programs based on these models.	x				X	x		x						x




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Practical: design programs for structure analysis using Excel or MATLAB								
Study of available programs and modifying them for analysis of certain problems.	X		X	X	X			X
Training on the use of available commercial software programs. Practical: using sap, excel, EPANET	X		X	X	X			X
Computer applications. Practical: choosing a civil engineering case study for structural analysis, pipe network design, hydraulics, and sanitary engineering.	X		X	X	X			X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid-term examination	C2	a1, c1
	C11	c1	
2	Somostor work	C2	a1, c1
	Semester work	C11	c1
3	Practical Examination	C11	c1
4	Einel toma exemination	C2	a1, c1
		C11	c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	$2^{nd}, 7^{th}, 9^{th}$
2	Mid Term examination	8 th
3	Practical Examination	14 th





4	Final term examination	15 th				
7.3 W	7.3 Weighting of Evaluation:					
No.	Evaluation Method	Weights				
1	Mid-term examination	10%				
2	Semester work	20%				
3	Practical Examination	10%				
4	Final-term examination	60%				
	Total	100%				

8. List of References:

No.	Reference List
1	Brain R. Hunt et al. A Guide to MATLAB for Beginners and Experienced Users, 2018
2	Wendly L. Martinez et al. Computational statistics Handbook with MATLAB, 2019
3	Brain D. Hahn et al. Essential MTLAP for Engineering and scientists, 2018

9. Facilities required for teaching and learning:

Faci	Facility					
1	Lecture classroom	3	White board			
2	Seminar	4	Data show system			
5	Lab.					

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Study of theoretical models for the analysis of structures. Practical: analyze beams, frames, trusses and slabs	7, 10	C2	a1, c1
2	Study of how to choose suitable methods for analysis of various structures. Practical: choose suitable methods for designing beams, frames, trusses and slabs	7, 10	C2	a1, c1
3	Preparation of simple programs based on these models. Practical: design programs for structure analysis using Excel or MATLAB	7, 10	C2 C11	al, cl cl
4	Study of available programs and modifying them for analysis of certain problems.	7, 10	C2 C11	a1, c1 c1
5	Training on the use of available commercial software programs. Practical: using sap, excel, EPANET	7,10	C2 C11	al, cl cl
6	Computer applications. Practical: choosing a civil engineering case study for structural analysis, pipe network design, hydraulics, and sanitary engineering.	10	C11	C1

Course Coordinator: Assoc. Prof. Dr. Mohamed Gabr **Head of Department:** Prof. Dr. Mohammed Elkiki **Date of Approval:** 2022





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Water Supply and Sanitary Engineering (CIE406)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Water Supply and Sanitary Engineering
Course Code	CIE406
Year/Level	Level 5
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	ENG 301

Taashing houng	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims
3	Recognize his or her role in promoting water supply and sanitary engineering by appreciating
	the importance of the physical and natural environment.
7	Achieve an optimum design of water supply and sanitary works

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a3 Explain the basic principles of water supply and sanitary engineering works. b2 Using scientific concepts and theories that are relevant to water supply and sanitary works.
C10 Acquire and apply new knowledge, and practice self, lifelong, and other learning strategies.	d1 Search for information to engage in lifelong self-learning water supply and sanitary engineering discipline.
C11 Select appropriate and sustainable technologies for water supply and sanitary project structures; use numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of hydraulics and fluid mechanics.	a2 Summarize, appropriate and sustainable technologies for water supply and sanitary works and stages.
C12 Achieve an optimum design of Water Supply and Sanitary Works.	b2 Achieve an optimum design of works for sanitary works, or any other emerging field relevant to the discipline.





4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Sources of water and water pollution	2	2	-
2	Drinking water standards, and water quality requirements	2	2	-
3	Surface and groundwater collection (Intakes and wells)	2	2	
4	Water purification stages (Coagulation, flocculation, and sedimentation)	4	4	-
5	Water purification stages (filtration and disinfection)	4	4	-
6	Water storage and distribution	2	2	-
7	Sewage sources and characteristics	2	2	-
8	Planning and design of sewerage system	4	4	-
9	Design of pump stations	2	2	
10	Planning and design of primary and secondary wastewater treatment units	4	4	
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and	Cooperative	Discovering	Modeling	Tutorial
Sources of water and water pollution	x			x	x					Х				x
Drinking water standards, and water quality requirements	x			x	x									x
Surface and groundwater collection (Intakes and wells)	x			x	x									x
Water purification stages (Coagulation, flocculation, and sedimentation)	x			x	x					x				x
Water purification stages (filtration and disinfection)	x			x	x									x
Water storage and distribution	x			x	x									x
Sewage sources and characteristics	x			x	x					x				x
Planning and design of sewerage system	x			x	x									x
Design of pump stations	x			x	x									x
Planning and design of primary and secondary wastewater treatment units	x			x	x									x





6. Teaching and learning methods for disable students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium and high- performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C1	a3, b2
1	Midterm examination	C10	d1
1		C11	a2
		C12	b2
	Semester work (quizzes, sheets, reports)	C1	a3, b2
2		C10	d1
Z		C11	a2
		C12	b2
		C1	a3, b2
2	Final term examination	C2	d1
3		C11	a2
		C12	b2

7.2 Evaluation Schedule:

vv eeks
8 th
Continuous
15 th
Continuous 15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. List of References:

No.	Reference List
	Course notes:
1	Lecture notes prepared by the course coordinator.
	Solved examples.
	Essential books (textbooks):
2	 الكود المصري لأسس تصميم وتنفيذ محطات تنقية مياه الشرب والصرف الصحى ومحطات الرفع – قرار وزاري رقم
	169 لسنة 1997-الطبعة الثالثة 2004.
3	Recommended books







	Wastewater Engineering: Treatment and Reuse (McGraw-Hill Series in Civil and
	Environmental Engineering)-16 May 2002-by N/A Metcalf & Eddy, Inc., George
	Tchobanoglous, Franklin Burton, H. David Stensel
	1- د /محمد صادق العدوى "هندسة امداد المياه" دار صادق للنشر _ كلية الهندسة جامعة القاهرة
	2- د /محمد سعيد الخولى "الهندسة الصحية للمباني " - كلية الهندسة جامعة عين شمس
4	3- د /محمد على على فرج "الهندسة الصحية" منشأة المعارف بالاسكندرية – كلية الهندسة جامعة الاسكندرية
	4- د/ احمد فاضل عشري "امداد المدن بالمياه – تنقية مياه الشرب – معالجة المخلفات السائلة" – كلية الهندسة – قسم
	الاشغال العامة – جامعة المنصورة
	Periodicals, Web sites, etc.
5	www.awwa.org
5	www.epa.gov
	www.wef.org

9. Facilities required for teaching and learning:

	Facility							
1	Lecture classroom	3	White board					
2	Seminar	4	Data show system					

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Sources of water and water pollution	3, 7	C1	a3, b2
2	Drinking water standards, and water quality requirements	3,7	C1, C10	a3, b2, d1
3	Surface and groundwater collection (Intakes and wells)	3,7	C10, C11	d1, a2
4	Water purification stages (Coagulation, flocculation, and sedimentation)	3, 7	C10, C11, C12	d1, a2, b2
5	Water purification stages (filtration and disinfection)	3,7	C10, C11, C12	d1, a2, b2
6	Water storage and distribution	3, 7	C11, C12	a2, b2
7	Sewage sources and characteristics	3, 7	C1	a3, b2
8	Planning and design of sewerage system	3, 7	C10, C11	d1, a2
9	Design of pump stations	3, 7	C11, C12	a2, b2
10	Planning and design of primary and secondary wastewater treatment units	3, 7	C11, C12	a2, b2

Course Coordinator: Assoc. Prof. Dr. Medhat Elzahar **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Steel Structures Design (2)</u> (CIE407)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Steel Structures Design (2)
Course Code	CIE407
Year/Level	Level 4
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	CIE402

Toophing hours	Lectures	Tutorial	Practical
reaching nours	3	2	-

2. Course Aims

No.	Aims
6	Analyze data from the intended tests to manage resources creatively.
7	Achieve an optimum design of steel structures.
10	Select appropriate and sustainable technologies for construction of steel buildings.

Competencies	Learning Outcomes (LO'S)			
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	a3 Explain the basic principles of engineering in steel structures design.b3 Applying engineering basics that are relevant to the steel structures design.			
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.	a1 Define, basic characteristics, properties, concepts, and techniques of structural analysis and mechanics, and properties and strength of materials of steel structures.			
C5 Practice research techniques and methods of investigation as an inherent part of learning.	d1 Search for information to engage in lifelong self-learning discipline.			
C11 Select appropriate and sustainable technologies for construction of steel buildings 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, and properties and strength of materials.	 a1 Recognize the fundamentals of structural analysis and mechanics, and properties and strength of materials of steel structures. c1 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, and properties and strength of materials of steel structures. 			





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C12 Achieve an optimum design of steel structures.	b1 Achieve an optimum design of stee	1
	structures.	

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
	Steel frame design:			
1	Rafter and crane girder design.	12	8	-
	Column design, single columns, built-up columns.			
2	Riveted and bolted connections.	6	4	-
3	High strength bolted connections.	6	4	-
4	Welded connections.	6	4	-
5	Base connections.	6	4	
6	Roof truss structures' applications.	3	2	-
7	Rigid frame structures' applications.	3	2	
	Total	42	28	-

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and	Cooperative	Discovering	Modeling	Lab
Steel frame design: Rafter and crane girder design. Column design, single columns, built-up columns.	x			X	X									x
Riveted and bolted connections.	x			x	х									x
High strength bolted connections.	x			x	x									x
Welded connections.	x			х	х									x
Base connections.	x			x	х									x
Roof truss structures' applications.	x			х	х					х				x
Rigid frame structures' applications.	x			x	х					x				x

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments each composed	Knowledge and skills transfer
2	of low, medium, and high-performance students.	among different level of students.



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7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
	Midterm examination	C1	a3, b3, c3
1		C2	a1, c3
1		C11	c1
		C12	b1
		C1	a3, b3, c3
	Semester work (quizzes, sheets, report)	C2	a1, c3
2		C5	d1
		C11	a1, c1
		C12	b1
	Final term examination	C1	a3, b3, c3
2		C2	a1, c3
5		C11	a1, c1
		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	continuous evaluation
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. List of References:

No.	Reference List
	Course notes:
1	Lecture notes prepared by the course coordinator.
	Solved examples.
	Essential books (textbooks):
2	Egyptian Code of Practice for Steel Construction and Bridges (ASD), Code No. 205, HBRC,
	2003.
	Recommended books
3	E. B. Machaly, "Behavior, analysis and design of structural steel element", vol. 1, 2019.
	E. B. Machaly, "Behavior, analysis and design of steel work connections", vol. 3, 2019.
	Periodicals, Web sites, etc.
4	www.steelconstruction.org
	www.modernsteel.com
	www.berlinsteel.com





9. Facilities required for teaching and learning:

	Facility								
1	Seminar	3	teaching aids as interactive (smart) board						
2	discussions rooms with internet connections	4	Data Show						

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
	Staal frame design:		C1,	a3, b3, c3
1	Defen and arone sinder design		С2,	a1, c3
1	- Kalter and erane girder design.	0,10	C11	c1
	- Column design, single columns, bunt-up columns.		C12	b1
			C1,	c3
2	Riveted and bolted connections.	6,7	C11,	c1
			C12	b1
			C1,	c3
3	High strength bolted connections.	6,7	C11,	c1
			C12	b1
	Welded connections.		C1,	c3
4		6,7	C11,	c1
			C12	b1
	Base connections.	6,7	C1,	c3
5			C11,	c1
			C12	b1
			C1,	a3, b3, c3
6	Poof truss structures' applications	6 10	С5,	d1
0	Root truss structures applications.	0,10	C11,	a1, c1
			C12	b1
			C1,	a3, b3, c3
7	Pigid frame structures' applications	6,10	С5,	d1
/	Rigid frame structures applications.		C11,	a1, c1
			C12	b1

Course Coordinator: Assoc. Prof. Dr. Ashraf Elsabagh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022







Reinforced Concrete (3) (CIE408)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Reinforced Concrete (3)
Course Code	CIE408
Year/Level	Level 4
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre- request	CIE403

Togohing hours	Lectures	Tutorial	Practical
reaching nours	3	2	-

2. Course Aims

No.	Aims
7	Achieve an optimum design of Reinforced Concrete.

Competencies	Learning Outcomes (LO'S)
C2 Develop and conduct appropriate simulation, analyze, and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	 a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings, infrastructures. b1 Conduct basic experiments to learn about the basic characteristics and features of structural analysis and mechanics, properties, and strength of materials. c3 Applying statistical analyses and objective engineering judgment to draw conclusions.
C11 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.	 a1 Recognize the fundamentals of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology, and fluid mechanics. a2 Summarize, appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures.
C12 Achieve an optimum design of Reinforced Concrete.	b1 Achieve an optimum design of Reinforced Concrete





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4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Design of halls with beam girders and long column	9	6	-
2	Design of frames	9	6	-
3	Design of arches (slab and girder)	9	6	-
4	Design of trusses	6	4	-
5	Design of Vierendeel girder	6	4	-
6	Design of saw tooth roofs	3	2	_
	Total	42	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Design of halls with beam girders and long column	x				x	x		x						
Design of frames	x				x	x		x						
Design of arches (slab and girder)	x				x	X		x						
Design of trusses	x				x	x		x						
Design of Vierendeel girder	x				x	x		x						
Design of saw tooth roofs	x				x	x		x						

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning





7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid torm examination	C2	a2
1		C11	al
n	Semester work	C2	a2
2		C12	b1
		C2	a2, c3, b1
3	Final term examination	C11	a1, a2
		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	2^{nd} , 7^{th} , 9^{th}
2	Mid Term examination	8 th
3	Practical Examination	14 th
4	Final term examination	15 th

7.3 W	7.3 Weighting of Evaluation:				
No.	Evaluation Method	Weights			
1	Mid-term examination	20%			
2	Semester work	20%			
3	Final-term examination	60%			
	Total	100%			

8. List of References:

No.	Reference List
1	Course notes: Are delivered during the lecture, including handout materials such as solved
1	problems, design charts, tables, etc.
	Essential books (textbooks / design codes):
2	Egyptian Code for Design and Construction of Reinforced Concrete Structures 203-2001.
	Design Aids and Examples in Accordance with the Egyptian Code for Design and
	Construction of Reinforced Concrete Structures 203-2020.

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Design of halls with been girders and long column	7	C2	a2, c3
1	Design of name with beam griders and long column		C11	a1
n	Design of from or	7	C2	a2, c3
Z	Design of frames		C12	b1





3	Design of arches (slab and girder)	7	C11 C12	al bl
4	Design of trusses	7	C2 C11 C12	a2, c3 a1 b1
5	Design of Vierendeel girder	7	C2 C11 C12	b1, b2 a1 b1
6	Design of saw tooth roofs	7	C2 C11 C12	b1, b2 a1 b1

Course Coordinator: Dr. Hamdy Abd Elaty **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022







<u>Environmental Management</u> (ENG401)

1. Basic Information:

Program Title	All Programs
Department Offering the Program	Basic Science and Engineering Department
Department Responsible for the Course	Basic Science and Engineering Department
Course Title	Environmental Management
Course Code	ENG401
Year/Level	Level 4
Specialization	Major – Compulsory Course
Authorization Date of Course Specification	-
Pre-request	-

Taaahing hours	Lectures	Tutorial	Practical		
reaching nours	3	-	-		

2. Course Aims:

No.	Aims
	Work in and manage a diverse team of professionals from various engineering disciplines,
2	taking responsibility for own and team performance; and behave professionally and adhere to
	engineering ethics and standards.
	Recognize his or her role in promoting engineering and contributing to the profession's and
3	community's development; by appreciating the importance of the environment, both physical
	and natural, and working to promote sustainability concepts;

Competencies	Learning Outcomes (LO'S)
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.	 a2 Understand the professional ethics and impacts of engineering solutions on society and environment. a3 Recognizes the environmental and economic impact of various industries, waste minimization, and industrial facility remediation. b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. c1 Incorporate economic, societal, global, environmental, and risk management factors into design.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	 a1 Describe quality assurance systems, codes of practice, and standards, as well as health and safety regulations and environmental concerns. c1 Apply safe systems at work by taking the necessary precautions to manage hazards. c3 Utilize modern technologies.





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C10 Acquire and apply new	d1 Search for information to engage in lifelong self-
knowledge; and practice self, lifelong	learning discipline.
and other learning strategies.	

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	The importance of studying environmental science – modern technology and its effect on the environment	12	-	-
2	quality of the environment and development elements	6	_	_
3	sources of environmental pollution and method of control (air pollution – water pollution)	12	-	-
4	Solid wastes pollution – noise) – economics of environmental pollution control – legislations for the environment protection.	12	-	-
	Total	42	-	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
The importance of studying environmental science – modern technology and its effect on the environment	x				x	x								x
Qualityoftheenvironmentanddevelopment elements	x				X	x								x
Sources of environmental pollution and method of control (air pollution – water pollution	x				x	x								x
Solid wastes pollution – noise) – economics of environmental pollution control – legislations for	X				X	x								X





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the	environment							
protection.								

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material.	Better access any time.
2	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different levels of students.

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's				
1	Mid Term Examination	A3, A4	a1, b1				
2	Semester work (report, quizzes, presentation)	A4, A10	d1, c1, c3				
3	Final Term Examination	A3, A4, A10	a2, a3, a1, d1				
7.2 Evaluation Schedule:							

1.4 L	7.2 Evaluation Schedule:								
No.	Evaluation Method	Weeks							
1	Semester work	2 nd , 7 th , 9 th							
2	Mid Term Examination	8 th							
3	Final Term Examination	15 th							
7.3 W	7 3 Weighting of Evaluation.								

No.	evaluation method	Weights						
1	Mid-term examination	20%						
2	Semester work	20%						
3	Final-term examination	60%						
	Total	100%						

8. List of References:

No.	Reference List
1	د.زكريا طاحون , ادارة البيئة نحو الانتاج الأنظف, الهيئة المصرية العامة للكتاب القاهرة,2018
2	محمد اسماعيل خضر مقدمة في علوم البيئة الهيئة العامة للكتاب القاهرة 2018

9. Facilities required for teaching and learning:

No.	Facility
1	Seminar
2	Lecture Classroom
3	White Board
4	Data Show system

10. Matrix of Competencies and LO's:

No.	Торіс	Aims	Competencies	LO's
1	The importance of studying environmental science – modern technology and its effect on the environment	2, 3	C3, C10	d1, a2
2	Quality of the environment and development elements	2, 3	C3, C10, C4	d1, b1, a1





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3	Sources of environmental pollution and method of control (air pollution – water pollution	2, 3	C3, C4	a3, c1
4	Solid wastes pollution – noise) – economics of environmental pollution control – legislations for the environment protection.	2, 3	C3, C4	c1, c3

Course Coordinator: Assoc. Prof. Dr. Ramadan Elkateb **Head of Department:** Assoc. Prof. Dr. Amal Bahiry **Date of Approval:** 2022





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<u>Construction Estimating and Tendering</u> (CIE411)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Construction Estimating and Tendering
Course Code	CIE411
Year/Level	Level 5 – Semester 2
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Teaching Houng	Lectures	Tutorial	Practical
Teaching Hours	2	2	-

2. Course Aims

No.	Aims
6	Analyze data from the intended tests to manage resources creatively.
8	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.
9	Deal with biddings, contracts, and financial issues including project insurance and guarantees.

Competencies	Learning Outcomes (LOs)					
C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d2 Effectively manage tasks, time, and resources.					
C13 Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.	a1 Define the plan and manage the construction process.					
C14 Deal with biddings, contracts, and financial issues including project insurance and guarantees.	 a1 Define biddings, contracts, and financial issues. b1 Address biddings, contracts, and financial issues including project insurance and guarantees. c1 Apply biddings, contracts, and financial issues on civil engineering projects. 					





4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Principles of Construction Cost Estimating, Methods of Detailed Cost Estimating	8	8	-
2	Quantity Takeoff	4	4	-
3	Analysis of Labor and Equipment Costs	4	4	-
4	Construction Tendering Process, Bidding and Contracting Systems for Construction Projects	8	8	-
5	Laws and Regulations Related to the Construction Industry	4	4	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	PrinciplesofConstructionCostEstimating,MethodsofDetailedCostEstimating		\checkmark		\checkmark										
2	Quantity Takeoff														
3	Analysis of Labor and Equipment Costs	\checkmark					\checkmark								
4	Construction Tendering Process, Bidding and Contracting Systems for Construction Projects		\checkmark		\checkmark										
5	Laws and Regulations Related to the Construction Industry		V												





6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases
3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High-Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C9	d2
1	Semester Works (Quizzes, Sheets, Reports)	C13	al
		C14	a1, b1, c1
2	Mid Torm Exam	C9	d2
2	Mid-Term Exam	C13	al
		C9	d2
3	Final-Term Exam	C13	al
		C14	a1, b1, c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	4 th , 11 th
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights	
1	Semester Works (Quizzes, Sheets, Reports)	20%	
2	Mid-Term Exam	20%	
3	Final-Term Exam	60%	
	Total	100%	

8. List of References:

No.	Reference List		
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and		
1	Development. Chartered Institute of Building (Great Britain).		
n	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,		
2	Scheduling, and Control.		
3	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and		
3	Architects.		
1	Project Management Institute and Project Management Institute. A Guide to the Project		
4	Management Body of Knowledge (PMBOK Guide).		
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,		
Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.			
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.		





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9. Facilities Required for Teaching and Learning:

Facility				
1	Lecture Classroom	3	White Board	
2	Seminar	4	Data Show System	

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
1	Principles of Construction Cost Estimating,		C9	d2
1	Methods of Detailed Cost Estimating	0, 8	C13	al
2	Quantity Takaoff	6, 8	C9	d2
2	Quantity Takeon		C13	a1
3	Analysis of Labor and Eminment Costs	6, 8	C9	d2
	Analysis of Labor and Equipment Costs		C13	a1
4	Construction Tendering Process, Bidding and	0	C14	a1, b1, c1
4	Contracting Systems for Construction Projects	9		
5	Laws and Regulations Related to the	0	C14	a1 b1 a1
	Construction Industry	9	014	a1, 01, CI

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Air Conditioning Systems for Building</u> (CIE412)

1. Basic Information:

Program Title	Civil Engineering Program	
Department Offering the Program	Civil Engineering Department	
Department Responsible for the Course	Civil Engineering Department	
Course Title	Air Conditioning systems for Building	
Course Code	CIE412	
Year/Level	Level 4	
Specialization	Minor – Elective Course	
Authorization Date of Course Specification	-	
Prerequisite	Complete 100 h	

Taashing houws	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims
	Use the techniques, skills, and current engineering tools required for engineering practice by
4	taking full responsibility for one's own learning and development, participating in lifelong
	learning, and demonstrating the ability to pursue postgraduate and research studies.
	Communicate effectively with a variety of audiences using a variety of forms, methods, and
5	languages; cope with academic and professional issues in a critical and creative manner; and
	display leadership, business administration, and entrepreneurial abilities.

Competencies	Learning Outcomes (LO'S)
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.	b1 Conduct basic experiments to learn about the basic characteristics and features of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology and fluid mechanics.
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.	b1 Judge engineering decisions considering balanced costs, benefits, safety, quality.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	a3 Define contemporary engineering technologies and their applications in relation to disciplines.
C13 Plan and manage construction processes; address construction defects, instability and quality issues;	b1 Address construction defects, instability and quality issues





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maintain safety measures in construction and materials;	c1 Assess environmental impacts of
and assess environmental impacts of projects.	projects.

4. Course Contents:

Topics	Lecture	Tutorial	Practical
Psychometric and process of air	2	2	-
Cooling load estimation	4	4	-
Refrigeration cycles.	4	4	-
Water chiller systems	4	4	-
Air handling system	2	2	-
Cooling towers	4	4	-
Equipment selection.	2	2	-
Installation, operation and maintenance of air	6	6	-
Total	28	28	
	TopicsPsychometric and process of airCooling load estimationRefrigeration cycles.Water chiller systemsAir handling systemCooling towersEquipment selection.Installation, operation and maintenance of airconditioning systemsTotal	TopicsLecturePsychometric and process of air2Cooling load estimation4Refrigeration cycles.4Water chiller systems4Air handling system2Cooling towers4Equipment selection.2Installation, operation and maintenance of air conditioning systems6Total28	TopicsLectureTutorialPsychometric and process of air22Cooling load estimation44Refrigeration cycles.44Water chiller systems44Air handling system22Cooling towers44Equipment selection.22Installation, operation and maintenance of air conditioning systems66Total2828

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Psychometric and process of air	Х	X			X									
Cooling load estimation	х	х			x	х								
Refrigeration cycles.	x	х		х	x	х								
Water chiller systems	х	х		x	x						х			
Air handling system	х	х		x	x		х							
Cooling towers	х	х		x	x		х							
Equipment selection.	x	х		х	x					х				
Installation, operation, and maintenance of air conditioning systems	x	x	x	x	x					x				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases





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3	Asking small groups to do assignments; each composed of low, medium and high-	Knowledge and skills transfer among different levels of students
	performance students	
4	Electronic model system for the Institution.	E-learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's	
		C2	b1	
1 Mic	Midterm examination	C3	b1	
		C13	c1	
2	Conceptor mult (minner alcosts non out)	C3	b1	
2	Semester work (quizzes, sneets, report)	C13	b1, c1	
3		C3	b1	
	Final term examination	C13	b1, c1	

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	$7^{ m th}$, $13^{ m th}$
2	Mid Term examination	8 th
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights	
1	Midterm examination	20%	
2	Semester work	20%	
3	Final term examination	60%	
	Total 100%		

8. List of References:

No.	Reference List
1	Heat and mass transfer pk Nag, tata McGraw Hill Education private limited, New delhi- 2011
1	Engineering thermodynamics on karsingh, new AGE Publisher, new delhi -2007

9. Facilities required for teaching and learning:

Facility					
1	Lecture classroom	3	White board		
2	Seminar	4	Data show system		

10. 10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Psychometric and process of air	4	C13	b1, c1,
2	Cooling load estimation	3	C3, C13	b1, c1
3	Refrigeration cycles.	4	C2, C13	b1, c1
4	Water chiller systems	3	C3, C13	b1, c1
5	Air handling system	4	C2, C13	b1, c1
6	Cooling towers	3	C3, C13	b1, c1





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7	Equipment selection.	4	C4, C13	b1, c1
8	Installation, operation and maintenance of air conditioning systems	3	C3, C13	b1, c1

Course Coordinator: Dr. Moataz Mostafa **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Design of Lighting Systems for Buildings (CIE413)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Design of Lighting Systems for Buildings
Course Code	CIE413
Year/Level	Level 4
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre-request	Complete 100 h

Taaahing haung	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims
4	Use the techniques, skills, and codes of practice effectively and professionally to design
4	lighting system for buildings.
	Communicate effectively with a variety of audiences using a variety of forms, methods, and
5	languages; cope with academic and professional issues in a critical and creative manner; and
	display leadership, business administration, and entrepreneurial abilities.
	Plan and manage construction processes; address construction defects, instability and quality
8	issues; maintain safety measures in construction and materials; and assess environmental
	impacts of projects.

Competencies	Learning Outcomes (LO'S)
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.	c1 Choose relevant mathematical and computer-based methodologies for problem modelling and analysis.
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.	c2 Applying engineering design procedures to generate cost-effective solutions while adhering to the principles and contexts of sustainable design and development.
C6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	c2 Acquire entrepreneurial skills.
construction defects, instability and quality issues; maintain	construction process.







safety measures in construction and materials; and assess
environmental impacts of projects.

4. Table of Content

No.	Topics	Lectures	Tutorial	Practical
1	Principles of lighting	2	2	-
2	lighting design for buildings which includes artificial lighting, point, line and area light sources, types and properties of luminaries, polar curves	6	6	-
3	design methods and calculations, glare index	4	4	-
4	lighting design standard	4	4	-
5	luminaire heat recovery system and lighting energy management	6	6	-
6	hybrid lighting	2	2	-
7	daylighting of buildings,	2	2	-
8	effect of climate on lighting	2	2	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Principles of lighting		Х			х	х								х
lighting design for buildings which includes artificial lighting, point, line and area light sources, types and properties of luminaries, polar curves		x			х	х								х
design methods and calculations, glare index		X			x	X								x
lighting design standard		х			X	х								X
luminaire heat recovery system and lighting energy management		x			x	x								x
hybrid lighting		Х			Х	Х								Х





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daylighting of buildings,	x		x	X				X
effect of climate on lighting	x		x	x				X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
r	Asking small groups to do assignments; each composed	Knowledge and skills transfer
2	of low, medium, and high-performance students.	among different level of students.

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midtom examination	C2	c1
		C13	al
n	Someoton would (aviguage abooto non out)	C6	c2
2	Semester work (quizzes, sneets, report)	C13	al
2		C3	c2
3	Final term examination	C13	al

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work	2 nd ,7 th , 9 th
2	Mid Term examination	8 th
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	الكود المصري لاسس تصميم وشروط تنفيذ اعمال اناره الطرق والانفاق كود(2/308)- المركز القومي لبحوث الاسكان
1	والبناء – وزاره الاسكان والمرافق والتنميه العمرانيه 2012
2	الاضاءه الطبيعيه في ضوء محددات قانون البناء في مصر -د.خالد محمد الحديدي – كليه هندسه شبر ا – جامعه بنها- 2010

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system





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10.	Matrix of knowledge and skills of the course:			
No	Торіс	Aims	Competencies	LO's
1	Principles of lighting	4	C2	c 1
	lighting design for buildings which includes artificial			
2	lighting, point, line and area light sources, types and	4	C3	c2
	properties of luminaries, polar curves			
3	design methods and calculations, glare index	4	C13	a1
4	lighting design standard	4	C6	c2
5	luminaire heat recovery system and lighting energy	1	<u>C6</u>	ີ
5	management	4	Co	CZ
6	hybrid lighting	4	C13	a1
7	daylighting of buildings,	4	C13	al
8	effect of climate on lighting	4	C13	al

Course Coordinator: Dr. Rabab Reda **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Productivity Enhancement Methods</u> (CIE414)

1. Basic Information

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Productivity Enhancement Methods
Course Code	CIE414
Year/Level	Level 4
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Teaching Houng	Lectures	Tutorial	Practical		
reaching Hours	2	2	-		

2. Course Aims

No.	Aims
	Work in and manage a diverse team of professionals from various engineering disciplines,
2	taking responsibility for own and team performance, behaving professionally, and adhering
	to engineering ethics and standards.
	Communicate effectively with various audiences using various forms, methods, and
5	languages; cope with academic and professional issues critically and creatively; and display
	leadership, business administration, and entrepreneurial abilities.
6	Analyze data from the intended tests to manage resources creatively.
	Plan and manage construction processes; address construction defects, instability, and
8	quality issues; maintain safety measures in construction and materials; and assess the
	environmental impacts of projects.

Competencies	Learning Outcomes (LOs)				
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.	b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.				
C4 Utilize contemporary technologies,	b1 Create methodical approaches when dealing with				
codes of practice and standards, quality	new and advancing technology.				
guidelines, health and safety requirements,	c1 Apply safe systems at work by taking the				
environmental issues, and risk management	necessary precautions to manage hazards.				
principles.	c3 Utilize modern technologies.				





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	d1 Collaborate effectively within a multidisciplinary
C7 Function efficiently as an individual and	team.
as a member of multi-disciplinary and	d2 Work in stressful environments and within
multicultural teams.	constraints.
	d3 Motivate individuals.
C9 Use creative, innovative, and flexible	
thinking and acquire entrepreneurial and	d) Effectively menore tests time and recovered
leadership skills to anticipate and respond to	uz Effectively manage tasks, time, and resources.
new situations.	

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Identification of Bottlenecks	6	6	-
2	Impact of Human Performance on Productivity	6	6	-
3	Effect of the Interaction Between Technological Advances and Human Capabilities on Performance and Productivity	8	8	-
4	Cost Reduction and Productivity Improvement Programs	8	8	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Identification of Bottlenecks														
2	Impact of Human Performance on Productivity														
3	Effect of the Interaction Between Technological Advances and Human Capabilities on Performance and Productivity	\checkmark					V								
4	Cost Reduction and Productivity														





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Improvement							
Programs							

6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases
3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C3	b1
1	Samastar Warks (Quizzas Shaats Paparts)	C4	b1, c1, c3
1	Semester works (Quizzes, Sheets, Reports)	C7	d1, d2, d3
		C9	d2
2	Mid Torm Exam	C7	d1, d2, d3
2		C9	d2
		C3	b1
3		C4	b1, c1, c3
		C7	d1, d2, d3
		C9	d2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	$4^{th}, 11^{th}$
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
	Total	100%

8. List of References:

No.	Reference List
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and
	Development. Chartered Institute of Building (Great Britain).
2	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,
	Scheduling, and Control.
2	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and
3	Architects.





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4	Project Management Institute and Project Management Institute. A Guide to the Project Management Body of Knowledge (PMBOK Guide).
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering, Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.

9. Facilities Required for Teaching and Learning:

Facility							
1	Lecture Classroom	3	White Board				
2	Seminar	4	Data Show System				

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
1	Identification of Bottlenecks	6, 8	C9	d2
2	Impact of Human Performance on Productivity	2, 5	C7	d1, d2, d3
	Effect of the Interaction Between Technological		C4	b1, c1, c3
3	Advances and Human Capabilities on	2, 5	C7	d1, d2, d3
	Performance and Productivity		C9	d2
	Cost Poduction and Productivity Improvement		C3	b1
4	Programs	6, 8	C4	b1, c1, c3
	riograms		C9	d2

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Quality Assurance and Engineering Reliability (CIE415)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Quality Assurance and Engineering Reliability
Course Code	CIE415
Year/Level	Level 4
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Teaching Houng	Lectures	Tutorial	Practical		
Teaching Hours	2	2	-		

2. Course Aims:

No.	Aims
1	Master a broad range of engineering knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.
8	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.

Competencies	Learning Outcomes (LOs)				
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.	 a3 Recognizes the various construction defects, instability, and quality issues and assesses the environmental impacts of projects. b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. 				
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	 a1 Describe quality assurance systems, codes of practice, standards, health and safety regulations, and environmental concerns. c4 Apply quality assurance procedures and follow codes and standards. 				
C13 Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.	b1 Address construction defects, instability, and quality issues.				





4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Reliability of Parallel and Serial Engineering Systems	6	6	-
2	Life Testing	6	6	-
3	Impact of Reliability on the Design Process in Engineering Fields Such as Mechanical, Electrical and Structural Engineering	8	8	-
4	Studies the Effect of Equipment Reliability on Product Quality	8	8	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Reliability of Parallel and Serial Engineering Systems	\checkmark			\checkmark										
2	Life Testing														
3	Impact of Reliability on the Design Process in Engineering Fields Such as Mechanical, Electrical and Structural Engineering	\checkmark				\checkmark									
4	Studies the Effect of Equipment Reliability on Product Quality	\checkmark					\checkmark								

6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases




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3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C3	a3, b1
1	Semester Works (Quizzes, Sheets, Reports)	C4	a1, c4
		C13	b1
2	Mid Town Exam	C4	a1, c4
2		C13	b1
		C3	a3, b1
3	Final-Term Exam	C4	a1, c4
		C13	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	4 th , 11 th
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
Tota	1	100%

8. List of References:

No.	Reference List
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and
I	Development. Chartered Institute of Building (Great Britain).
2	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,
2	Scheduling, and Control.
3	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and
3	Architects.
4	Project Management Institute and Project Management Institute. A Guide to the Project
4	Management Body of Knowledge (PMBOK Guide).
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,
3	Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.

9. Facilities Required for Teaching and Learning:

Fa	acility		
1	Lecture Classroom	3	White Board
2	Seminar	4	Data Show System





10. Matrix of Knowledge and Skills:

No.	Topic	Aims	Competencies	LOs
1	Reliability of Parallel and Serial Engineering Systems	1, 8	C4 C13	a1, c4 b1
2	Life Testing	1, 8	C4 C13	a1, c4 b1
3	Impact of Reliability on the Design Process in Engineering Fields Such as Mechanical, Electrical and Structural Engineering	1, 8	C3 C4 C13	a3, b1 a1, c4 b1
4	Studies the Effect of Equipment Reliability on Product Quality	1, 8	C3 C4 C13	a3, b1 a1, c4 b1

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





<u>Quality Control</u> (CIE416)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Quality Control
Course Code	CIE416
Year/Level	Level 4
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Teaching Hours	Lectures	Tutorial	Practical
Teaching Hours	2	2	-

2. Course Aims:

No.	Aims
1	Master a broad range of engineering knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.
8	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.

3. Competencies:

Competencies	Learning Outcomes (LOs)
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	 a3 Recognizes the various construction defects, instability, and quality issues and assesses the environmental impacts of projects. b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	 a1 Describe quality assurance systems, codes of practice, standards, health and safety regulations, and environmental concerns. c4 Apply quality assurance procedures and follow codes and standards.
C13 Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in	b1 Address construction defects, instability, and quality issues.





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nstruction and materials; and assess the
vironmental impacts of projects.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Design of Quality Control Systems	4	4	-
2	Quality Methods for Establishing Product Specifications	4	4	-
3	Process Control	4	4	-
4	Variables and Attributes Charts, Acceptance Sampling	6	6	-
5	Operating Characteristics Curves, and Process Capabilities	6	6	-
6	QC Software	4	4	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Design of Quality Control Systems						\checkmark								
2	Quality Methods for Establishing Product Specifications		\checkmark			\checkmark									
3	Process Control														
4	Variables and Attributes Charts, Acceptance Sampling	\checkmark			\checkmark										
5	Operating Characteristics Curves, and Process Capabilities					V									
6	OC Software														





6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases
3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C3	a3, b1
1	Semester Works (Quizzes, Sheets, Reports)	C4	a1, c4
		C13	b1
2	Mid Torm Exam	C3	a3, b1
2	Mid-Term Exam	C4	a1, c4
		C3	a3, b1
3	Final-Term Exam	C4	a1, c4
		C13	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	$4^{\text{th}}, 11^{\text{th}}$
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
	Total	100%

8. List of References:

No.	Reference List
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and
1	Development. Chartered Institute of Building (Great Britain).
2	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,
2	Scheduling, and Control.
3	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and
3	Architects.
4	Project Management Institute and Project Management Institute. A Guide to the Project
4	Management Body of Knowledge (PMBOK Guide).
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,
3	Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.





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9. Facilities Required for Teaching and Learning:

	Facility					
1	Lecture Classroom	3	White Board			
2	Seminar	4	Data Show System			

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
1	Design of Quality Control Systems	1, 8	C3 C4	a3, b1 a1, c4
2	Quality Methods for Establishing Product Specifications	1, 8	C3	a3, b1
3	Process Control	1,8	C4	a1, c4
4	Variables and Attributes Charts, Acceptance Sampling	1, 8	C3 C4 C13	a3, b1 a1, c4 b1
5	Operating Characteristics Curves, and Process Capabilities	1, 8	C3 C4 C13	a3, b1 a1, c4 b1
6	QC Software	1, 8	C3 C4 C13	a3, b1 a1, c4 b1

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022







Reliability of Structures (CIE417)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Reliability of Structures
Course Code	CIE417
Year/Level	Level 4
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre- request	Complete 100 h

Teaching hours	Lectures	Tutorial	Practical
Teaching nours	2	2	-

2. Course Aims

No.	Aims
1	The ability to apply probability theories and hypothesis testing in analytic critical and systemic
1	thinking to solve engineering problems of varying complexity and variation.
	Plan and manage construction processes; address construction defects, instability and quality
8	issues; maintain safety measures in construction and materials; and assess environmental
	impacts of projects.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
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.	 a1 Learn the general principles of Reliability of Structures. a2 Understand the professional ethics and impacts of engineering solutions on society and environment. c1 Incorporate economic, societal, global, environmental, and risk management factors into design.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	 a1 Describe quality assurance systems, codes of practice, and standards, as well as health and safety regulations and environmental concerns. c1 Apply safe systems at work by taking the necessary precautions to manage hazards.
C12 Achieve an optimum design of Reinforced	b1 Achieve an optimum design of Reinforced
Concrete.	Concrete





4. Course Contents:

No.	No. Topics		Tutorial	Practical
1	Fundamental concepts related to structural reliability, safety measures, load models, resistance models, system reliability	14	14	-
2	2 optimum safety levels, and optimization of design codes		14	-
	Total	28	28	-

5. Teaching and learning methods:

No.	Teaching Methods
1	Face-to-Face Lecture
2	Discussion sessions
3	Information collection from different sources
4	Research assignment
5	Online Lecture
6	Problem solving
7	Brain storming
8	Site visits
9	Self-learning and Research

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C3	a1, a2
2	Semester work (quizzes, sheets, report)	C3 C4 C9	a1, a2, c2 a1, c1 d 2
3	Final term examination	C4 C12	a1 b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	all
2	Mid Term examination	8 th
3	Final term examination	15 th





7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights		
1	Midterm examination	20%		
2	Semester work	20%		
3	Final term examination	60%		
	Total 100%			

8. List of References:

No.	Reference List				
	Essential books (textbooks / design codes):				
1	Egyptian Code for Design and Construction of Reinforced Concrete Structures 203-2010.				
1	Design Aids and Examples in Accordance with the Egyptian Code for Design and				
	Construction of Reinforced Concrete Structures 203-2012.				

9. Facilities required for teaching and learning:

Facility				
1 Lecture classroom 3 White board				
2	Seminar	4	Data show system	

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
	Fundamental concepts related to structural reliability,		C3	a1, a2, c 1
1	safety measures, load models, resistance models,	1	C4	a1, c1
	system reliability		C9	d2
	antimum sofaty layely and antimization of design		C3	a1, a2, c 1
2	optimum safety levels, and optimization of design		C4	a1, c1
	codes		C9	d2

Course Coordinator: Dr. Nesreen Elawadly **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Risk Management and Structures Safety</u> (CIE418)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Risk Management and Structures Safety
Course Code	CIE418
Year/Level	Level 4
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Taaabing Haung	Lectures	Tutorial	Practical	
Teaching Hours	2	2	-	

2. Course Aims:

No.	Aims
1	Master a broad range of engineering knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.
8	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.

3. Competencies:

Competencies	Learning Outcomes (LOs)				
C3 Apply engineering design processes	a3 Recognizes the various construction defects,				
to produce cost-effective solutions that	instability, and quality issues and assesses the				
meet specified needs with consideration	environmental impacts of projects.				
for global, cultural, social, economic,	b1 Judge engineering decisions considering balanced				
environmental, ethical, and other	costs, benefits, safety, quality, reliability, and				
aspects as appropriate to the discipline,	environmental impact.				
and within the principles and contexts of	c1 Incorporate economic, societal, global, environmental,				
sustainable design and development.	and risk management factors into design.				
C4 Utiliza contemporary technologies	a1 Describe quality assurance systems, codes of practice,				
codes of practice and standards quality	environmental concerns				
guidelines health and safety	c1 Apply safe systems at work by taking the necessary				
requirements environmental issues and precautions to manage hazards					
risk management principles					
nsk management principles.	and standards				

4. Course Contents:





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No.	Topics	Lecture	Tutorial	Practical
1	Principles and Practice Regarding Safety in Building	4	4	-
2	Accidental Prevention and Safety Control	4	4	-
3	Fire Control, and Fire Resistance of Building Materials	8	8	-
4	Safety Provisions for Fire and Other Hazards in Building, Safety Standards and Codes	8	8	-
5	Governmental Regulations and Inspection Procedures	4	4	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Principles and Practice Regarding Safety in Building														
2	Accidental Prevention and Safety Control					\checkmark									
3	Fire Control, and Fire Resistance of Building Materials	\checkmark				\checkmark									
4	Safety Provisions for Fire and Other Hazards in Building, Safety Standards and Codes	\checkmark		\checkmark											
5	Governmental Regulations and Inspection Procedures	\checkmark				\checkmark									

6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases





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3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
1	Semester Works (Ouizzes Sheets Reports)	C3	a3, b1, c1
1	Semester works (Quizzes, Sheets, Reports)	C4	a1, c1, c4
n	Mid-Term Exam	C3	a3, b1, c1
2		C4	a1, c1, c4
2	Einel Terrer Errer	C3	a3, b1, c1
3		C4	a1, c1, c4

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	4 th , 11 th
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
	Total	100%

8. List of References:

No.	Reference List
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and
1	Development. Chartered Institute of Building (Great Britain).
ſ	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,
2	Scheduling, and Control.
2	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and
3	Architects.
1	Project Management Institute and Project Management Institute. A Guide to the Project
4	Management Body of Knowledge (PMBOK Guide).
"	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,
3	Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.

9. Facilities Required for Teaching and Learning:

	Facility							
1	Lecture Classroom	3	White Board					
2	Seminar	4	Data Show System					



<u>10. Matrix of Knowledge and Skills:</u>

No.	Торіс	Aims	Competencies	LOs
1	Principles and Practice Regarding Safety	1 0	C3	a3, b1, c1
1	in Building	1, 0	C4	a1, c1, c4
2	Accidental Prevention and Safety	1 8	C3	a3, b1, c1
2	Control	1, 0	C4	a1, c1, c4
2	Fire Control, and Fire Resistance of	1 0	C3	a3, b1, c1
5	Building Materials	1, 0	C4	a1, c1, c4
	Safety Provisions for Fire and Other		C^{2}	a^{2} b1 a^{1}
4	Hazards in Building, Safety Standards	1,8		a_{3}, b_{1}, c_{1}
	and Codes		C4	a1, c1, c4
5	Governmental Regulations and	1 0	C3	a3, b1, c1
3	Inspection Procedures	1, 8	C4	a1, c1, c4

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Soil Mechanics and Foundation (CIE501)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Soil Mechanics and Foundation
Course Code	CIE501
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre- request	CIE404

т. I. [.] . I	Lectures	Tutorial	Practical		
l eaching nours	2	2	-		

2. Course Aims

No.	Aims
7	Achieve an optimum design of foundations and earth retaining structures.
10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies

3. Competencies:

Competencies	Learning Outcomes (LO'S)				
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a1 Describe the relevant mathematical principles and theories in the discipline. a2 Explain the scientific principles and theories that apply to the topic. a3 Explain the basic principles of soil mechanics. b2 Using scientific concepts and theories that are relevant to soil mechanics and foundation. 				
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.	 a2 Define the principles, basic properties, and features of soil mechanics and foundation and use the sustainable technologies. b3 Analyze and interpret data 				
C10 Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	 d1 Search for information to engage in lifelong self-learning discipline. d2 Professionally merge the engineering fundamentals, understanding, and feedback to improve design, products and/or services. 				
C11 Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using	a1 Recognize the fundamentals of structural analysis and mechanics, properties and strength of materials,				





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either numerical techniques or physical	surveying, soil mechanics, hydrology, and fluid
measurements and/or testing by applying a	mechanics.
full range of civil engineering concepts and	a2 Summarize, appropriate and sustainable
techniques of structural analysis and	technologies for soil mechanics.
mechanics, properties and strength of	6
materials, surveying, soil mechanics,	
hydrology and fluid mechanics.	
C12 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:	b2 Achieve an optimum design of soil mechanics
Transportation and Traffic, Roadways and	and retaining structures.
Airports, Railways, Sanitary Works,	
Irrigation, Water Resources and Harbors; or	
any other emerging field relevant to the	
discipline.	

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Stresses in soil mass	4	4	-
2	Consolidation of soil	4	4	-
3	Settlement and contact pressure	4	4	-
4	Lateral earth pressure	4	4	-
5	Slope stability	4	4	-
6	Retaining walls – sheet piles	4	4	-
7	Soil bearing capacity	4	4	_
	Total	28	28	-

<u>5. Teaching and learning methods:</u>

Topics		Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
Stresses in soil mass	x	x		х	x	x								
Consolidation of soil	X	х		Х	x	x								
Settlement and contact pressure	x	x		x	x	x				x				
Lateral earth pressure	X	x		Х	x	x								





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Slope stability	x	X	x	X	x		X		
Retaining walls – sheet piles	х	х	х	х	x				
Soil bearing capacity	х	х	х	х	х				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation method	Competencies	LO's
1	Midterm examination	C1 C2 C11 C12	a1,a2,a3,b2 a2,a3 a1, a2 b2
2	Semester work (quizzes, sheets, report)	C10	d1, d2
3	Final term examination	C1 C2 C11 C12	a1,a2,a3,b2 a2,a3 a1, a2 b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks						
1	Midterm examination	8th						
2	Semester work	continuous evaluation						
3	Final term examination	15 th						
7.3 Weighting of Evaluation:								
No.	Evaluation Method	Weights						
1	Midterm examination	20%						

	Total	100%
3	Final term examination	60%
2	Semester work	20%
1	Midterm examination	20%

8. List of References:

No.	Reference List
	Course notes:
-	Lecture notes prepared by the course coordinator +Solved examples.







2	Das, B., M. (2017), "Principles of geotechnical Engineering " Eighth Edition, CENGAGE Learning,
3	Knappett, J.A. and Craige R. F. (2012), "Craig's Soil Mechanics" Eighth Edition, Spon Press.
4	Essential books (textbooks):
	Egyptian Code of Practice for Soil Mechanics and Foundations (2002)

9. Facilities required for teaching and learning:

	Facility								
1	Lecture classroom	3	White board						
2	Seminar	4	Data show system						

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Stresses in soil mass	4, 7,10	C1	a3, b2
2	Consolidation of soil	4, 7,10	C11	a2
3	Settlement and contact pressure	4, 7,10	C11	a2
4	Lateral earth pressure	4, 7,10	C2 C11 C12	a2 a2 b2
5	Slope stability	4, 7,10	C1 C10	a3, b2 d1, d2
7	Retaining walls – sheet piles	4, 7,10	C2 C11 C12	a2 a2 b2
8	Soil bearing capacity	4, 7,10	C11	a2

Course Coordinator: Dr. Hany Hashish **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Highway and Airport Engineering (CIE502)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Highway and Airport Engineering
Course Code	CIE502
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre- request	CIE308

Taashing houng	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims
4	Use the techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development, participating in lifelong learning.
7	Achieve an optimum design of Roadways and Airports.
10	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using modern techniques, experiment measurements, and testing by applying a full range of civil engineering fields such as properties and strength of soil materials, surveying.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
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.	 a2 Define the principles and basic highway's structure materials and use the sustainable technologies. b2 Conduct basic experiments to learn about highways structural materials and surveying for geometric design or other emerging field relevant to the discipline. b3 Analyze and interpret data.
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.	 a1 Learn the general principles of design techniques specific to soil materials and highways structures using national highways codes. a3 Recognizes the various pavement construction defects. b1 Judge engineering decisions considering balanced quality of pavement,





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C6 Plan, supervise and monitor implementation of highways engineering projects	a1 Show the appropriate and sustainable technologies for construction of highways and airports,
C11 Select appropriate and sustainable technologies for road construction	a2 Summarize, appropriate and sustainable technologies for highways construction
C12 Achieve an optimum design Roadways and Airports,	b2 Achieve an optimum design of works for highway alignment and pavement and or any other emerging field relevant to the discipline.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Basic design control	2	2	-
2	Geometric design of highways (sight distance, intersection, alignment, vertical curves	2	2	-
3	Soils and materials, classification, stabilization, design of flexible and rigid pavement, highway drainage	2	2	-
4	Introduction to Airport Engineering	2	2	-
5	Aircraft characteristics	2	2	-
6	Air traffic control and capacity	2	2	-
7	Airport configuration	2	2	-
8	Design of the landing area	4	4	-
9	Airport terminals	4	4	-
10	Design of airport pavements, landing, wind rose, airport land scape, terminals, capacity, control	4	4	-
11	Lighting and markings	2	2	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Basic design control	х				х	х								х
Geometric design of highways	x				x	X								x
Soils and materials	X				x	Х								X





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Introduction to Airport Engineering	X		X	X				X
Aircraft characteristics	х		х	х				х
Air traffic control and capacity	X		X	X				X
Airport configuration	Х		х	х				Х
Design of the landing area	X		x	X				X
Airport terminals	х		х	х				х
Design of airport pavements	X		X	X				X
Lighting and markings	Х		Х	Х				Х

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midtorm examination	C2	a2, b2
1		C12	b2
2	Semester work (quizzes, sheets, report)	C2	a2 c3
		C2	a2, b2, c3
3	Final term examination	C11	a2
		C12	h2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8th
2	Semester work	7th - 9th
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%





8. List of References:

No.	Reference List
1	Materials for Civil and Construction Engineers, Mamlouk and Zaniwski, ISBN:0-13147714- 5, 2016
2	Egyptian Code of Practice for Urban and Rural Roads, 2018
3	Huang, S. C., and Di Benedetto, H. (Eds.). (2015). Advances in asphalt materials: Road and pavement construction. Wood head Publishing.
4	Papagiannakis, A. T., & Masad, E. A. (2020). Pavement design and materials. John Wiley & Sons.

9. Facilities required for teaching and learning:

Facility					
1	Lecture classroom	3	White board		
2	Seminar	4	Data show system		

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Basic design control	1,7	C2	a2
2	Geometric design of highways	1,7	C2, C6	a1, a2 c3
3	Soils and materials	1,7	C2 C12	a2, b2 b2
4	Introduction to Airport Engineering	1, 7	C2 C12	a2 b2
5	Aircraft characteristics	1, 7	C2 C12	a2, c3 b2
6	Air traffic control and capacity	1, 7	C2 C11	a2, c3 a2
7	Airport configuration	1, 7	C2	a2 b3 c3
8	Design of the landing area	1, 7	C2 C6	a2 a1 b2
9	Airport terminals	1,7	C2 C11 C12	a2, b2, c3 a2 b2
10	Design of airport pavements	1, 7	C2	a2, b2
11	Lighting and markings	1, 7	C2	a2, b2

Course Coordinator: Assoc. Prof. Dr. Alaa Gabr **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Legal, Professional, and Social Aspects of Engineering (CIE503)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Legal, Professional, and Social Aspects of Engineering
Course Code	CIE503
Year/Level	Level 5
Specialization	Major
Authorization Date of Course	-
Pre- request	-

Taaahing haung	Lectures	Tutorial	Practical	
reaching nours	2	2	1	

2. Course Aims

No.	Aims
2	Work in and manage a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance; and behave professionally and adhere to engineering ethics and standards.
9	Deal with biddings, contracts and financial issues including project insurance and guarantees.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
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.	 a2 List the engineering-related business and management principles address construction defects, instability, and quality issues. b1 Address construction defects, instability, and quality issues.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, environmental issues, and risk management principles	b1 Create methodical approaches when dealing with new and advancing technology.
C14 Deal with biddings, contracts and financial issues including project insurance and guarantees.	al define biddings, contracts, and financial issue

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Building and construction contracts procedure	4	2	-
2	Types of construction contracts	4	4	-





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3	General conditions of contracts and contract documents	6	4	-
4	Legal obligations and governing international and Egyptian legislation	4	6	-
5	The role of the architect/ engineer in the construction process	2	4	-
6	The developments of the concepts of professionalism and ethics	4	2	-
7	Case historical will be discussed	4	2	-
	total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Building and construction contracts procedure	x				x	x								
Types of construction contracts	x				x	x								
General conditions of contracts and contract documents.	x				x	x								
Legal obligations and governing international and Egyptian legislation	x				x	x								
The role of the architect/ engineer in the construction process.	x				x	x								
The developments of the concepts of professionalism and ethics	x				x	x								
Case historical will be discussed	x				x	x								







6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different level of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid-term examination	C2, C4	a2, b1, b1
2	Semester work	C2, C4, C14	a2, b1, b1, a1
3	Final term examination	C2, C4, C14	a2, b1, b1, a1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work	2nd,7th,9th
2	Mid Term examination	8 <i>th</i>
3	Practical Examination	14 th
4	Final term examination	15 <i>th</i>

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Khurmi, R.S. (2014). " A textbook of hydraulics, fluid mechanics and hydraulic machines" S. Chanel and company Ltd. P.990
2	Subramanya, K. (2008) "Flow in open channels" McGra- Hill Education (India). P.602
3	Glenn E. Moglen. 2015. Fundamentals of Open Channel Flow. CRC Press. Available on Taylor & Francis eBooks.

9. Facilities required for teaching and learning:

Facility						
1	Lecture classroom	3	White board			
2	Seminar	4	Data show system			

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Building and construction contracts procedure	2,9	C2, C4, C14	a2, b1, b1, a1





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2	Types of construction contracts	2, 9	C2, C4, C14	a2, b1, b1, a1
3	General conditions of contracts and contract documents.	2,9	C2, C4, C14	a2, b1, b1, a1
4	Legal obligations and governing international and Egyptian legislation	2,9	C2, C4, C14	a2, b1, b1, a1
5	The role of the architect/ engineer in the construction process.	2,9	C2, C4, C14	a2, b1, b1, a1
6	The developments of the concepts of professionalism and ethics	2,9	C2, C4, C14	a2, b1, b1, a1
7	Case historical will be discussed	2, 9	C2, C4, C14	a2, b1, b1, a1

Course Coordinator: Dr. Ayman Helal **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Design of Irrigation Works (CIE504)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Design of Irrigation Works
Course Code	CIE504
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre-request	CIE401

Taaahing haung	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims
4	Use the techniques, skills, and current engineering tools required for the design of irrigation
-	works (bridges, culverts, syphons, locks, dams and heading up works).
7	Achieve the optimum design for the irrigation works (bridges, culverts, syphons, dams, and
1	heading up works).
10	Select appropriate and sustainable technologies for the irrigation works (retaining walls,
10	bridges, culverts, syphons, locks and heading up works).

3. Competencies:

Competencies	Learning outcomes (LO'S)
C1 Identify, formulate, and solve complex design of irrigation works problems by applying engineering fundamentals, basic science and mathematics.	 a1 Describe the relevant mathematical principles and theories in the discipline concepts regarding retaining walls, Bligh's and Lane's weighted creep theories, and the water losses through irrigation works. a3 Explain the principles types of retaining walls, and classification of irrigation works structures.
C11 Select appropriate and sustainable technologies for irrigation works (bridges, culverts, syphons, weirs, and dams)	a2 Summarize, appropriate and sustainable technologies for the construction of bridges, culverts, syphons, weirs, locks and dams.
C12 Achieve an optimum design of irrigation works bridges, culverts, syphons, weirs, locks and dams.	 b1 Achieve an optimum design of retaining walls, culverts, and bridges. b2 Achieve an optimum design of irrigation works syphons, weirs, locks and dams.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Introduction: design of irrigation works	2	2	-







2	Classification of retaining walls (R.W)	4	4	-
3	Design of gravity retaining walls	2	2	-
4	Design of reinforced concrete R.W.	2	2	-
5	Design of reinforced concrete bridges	2	2	-
6	Design of rolled steel joist bridge	2	2	-
7	Design of culverts	2	2	-
8	Design of syphons	4	4	-
9	Design of Heading up works (weirs)	4	4	-
10	Design of dams	2	2	-
11	Types and design of locks	2	2	
	Total	28	28	-

5. Teaching and Learning Methods:

Topics	Face-to-face lecture	On line lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site Visits	Self learning and Research	Cooperative	Discovering	Modeling	Lab
Introduction: design of irrigation works	х			х	х	x								
Classification of retaining walls (R.W)	X			x	x	x								
Design of gravity retaining walls	X				X	X								
Design of reinforced concrete R.W.	х				x	x								
Design of reinforced concrete bridges	x				x	x		x						





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Design of rolled steel joist bridge	x			X	X				
Design of culvert	X			X	X	X			
Design of syphons	X			X	X	X			
Design of heading up works (weirs)	x			X	X				
Design of dams	x			X	X				
Types and design of locks	x		X						

6. Teaching and Learning Methods of Disable Students:

No.	Teaching Method
1	Additional Tutorials
2	Online lectures and assignments

7. Student assessment:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C1	a1, a3
1	Mid Term Examination (written/ online)	C11	a2
		C12	b1
2		C1	a1, a3
	Formative (quizzes- online quizzes- presentation)	C11	a2
		C12	b1
		C1	a1, a3
3	Final Term Examination (written)	C11	a2
		C12	b1, b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Mid Term Examination (written/ online)	8th
2	Practical/ Oral Examination	15th
3	Formative (quizzes- online quizzes presentation- Tutorial and report assessment)	Every week
4	Final Term Examination (written)	Decided by Faculty Council
7.3 W	eighting of Evaluation:	
No.	Evaluation Method	Weights
1	Mid Term Examination (written/ online)	20%





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2	Formative (quizzes- online quizzes presentation- Tutorial and report assessment)	20%
3	Final Term Examination (written)	60%
	Total	100%

8. List of References:

No.	Reference List
1	Santosh Kumar Garg, "Irrigation Engineering and Hydraulic Structures: Water Resources
1	Engineering", Vol. II, Khanna Publishers Pvt. Ltd, 2016.
2	Novak P., Moffat A.I.B., Nalluri C., Narayanan R., "Hydraulic Strucures", 4th Ed., Taylor
2	& Francis, 2007.
2	Liu Zhi Ming, "Handbook of Hydraulic Structure: Design", 2nd Ed., China Water Press,
3	2000.
4	الكود المصري للموارد المائية وأعمال الري المجلد السابع الطبعة الأولى 2003

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	Lab Facilities
3	White Board
4	Data Show System
5	Presenter

10. Matrix of Knowledge and Skills of the Course

No.	Торіс	Aims	Competencies	LO's
1	Introduction: design of irrigation works	4, 7, 10	C1 C11	a3 a2
2	Classification of retaining walls (R.W)	4, 10	C1 C11	a3 a2
3	Design of gravity retaining walls	4, 10	C12	b1
4	Design of reinforced concrete R.W.	4, 10	C12	b1
5	Design of reinforced concrete bridges	4, 7, 10	C1 C11 C12	a1 a2 b1
6	Design of rolled steel joist bridge	4, 7, 10	C1 C11 C12	a1 a2 b1
7	Design of culverts	4, 7, 10	C1 C11 C12	a1 a2 b1
8	Design of syphons	4, 7, 10	C1 C11	a1 a2





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			C12	b1
9	Design of Heading up works (weirs)	4, 7, 10	C1 C11 C12	a1 a2 b1
10	Design of Dams	4, 7	C1 C11 C12	a1 a2 b1
11	Types and design of locks	4, 10	C11 C12	a2 b2

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Foundation Engineering (1) (CIE505)

1. Basic Information:

Program Title	Civil Engineering Program		
Department Offering the Program	Civil Engineering Department		
Department Responsible for the Course	Civil Engineering Department		
Course Title	Foundation (1)		
Course Code	CIE505		
Year/Level	Level 5		
Specialization	Major		
Authorization Date of Course Specification	-		
Pre- request	CIE501		

Toophing hours	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims							
6	Analyze data from the intended tests to manage resources creatively.							
7	Achieve an optimum design of Foundations and Earth Retaining Structures							
10	10- Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using numerical techniques, experiment measurements, and testing by applying a full range of civil engineering fields such as structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology and fluid mechanics.							

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a1 Describe the relevant mathematical principles and theories in the discipline. a2 Explain the scientific principles and theories that apply to the topic. a3 Explain the basic principles of engineering. b1 Using math ideas and theories that are applicable to the field. b2 Using scientific concepts and theories that are relevant to the profession. b3 Applying engineering basics that are relevant to the subject. c1 Identify, formulate, and solve complex engineering problems by -applying the concepts and the theories of mathematics.





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	 c2 Identify, formulate, and solve complex engineering problems by applying the concepts and the theories of sciences, appropriate to the discipline. c3 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals.
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.	 a1 Define, basic characteristics, properties, concepts, and techniques of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology, and fluid mechanics. a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings, infrastructures, and water structures
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	al Describe quality assurance systems, codes of practice, and standards.
C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d3 Refer to relevant literatures.
C12 Achieve an optimum design of Foundations.	b1 Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Design of strip footing	2	2	-
2	Design Isolated and combined footing	8	8	-
3	Design of strap beam	2	2	-
4	Design of raft foundations	8	8	-
5	Pile cap - pile Foundation	8	8	-
	Total	28	28	-





5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
Design of strip footing	x	x		X	x	x								
Design Isolated and combined footing	x	x		x	x	x								
Design of strap beam	x	x		X	x	x				Х				
Design of raft foundations	x	x		X	x	X				X				
Pile cap - pile Foundation	x	x		Х	x	X				Х				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C1 C4	a1 b1 c1 a2 b2 c2 a3 b3 c3 a1
2	Semester work (quizzes, sheets, report)	C1 C4	a1 b1 c1 a2 b2 c2 a3 b3 c3 a1
3	Final term examination	C1 C4 C9 C12	a1 b1 c1 a2 b2 c2 a3 b3 c3 a1 d3 b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8th
2	Semester work	continuous evaluation





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3 Final term examination			15 th
7.3 Weighting of Evaluation:			
No.	Evaluation Method		Weights
1	Midterm examination		20%
2	Semester work		20%
3	Final term examination		60%
Total 100%			100%

8. List of References:

No.	Reference List
1	Course notes:
1	Lecture notes prepared by the course coordinator +Solved examples.
2	Das, B., M. (2017), "Principles of Foundation Engineering ", CENGAGE Learning,
3	Gulhati, S.K. and Datta, M. (2015), "Geotechnical Engineering", Tata McGraw-Hill, New
	Delhi.
4	Essential books (textbooks):
	Egyptian Code of Practice for Soil Mechanics and Foundations (2002)

9. Facilities required for teaching and learning:

Facility			
1	Lecture classroom	3	White board
2	Seminar	4	Data show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Design of strip footing	6, 7, 10	C1 C4	a1 b1 c1 a2 b2 c2 a3 b3 c3 a1
2	Design Isolated and combined footing	6, 7, 10	C1 C4	a1 b1 c1 a2 b2 c2 a3 b3 c3 a1
3	Design of strap beam	6, 7, 10	C1 C4	a1 b1 c1 a2 b2 c2 a3 b3 c3 a1
4	Design of raft foundations	6, 7, 10	C1 C4 C9 C12	a1 b1 c1 a2 b2 c2 a3 b3 c3 a1 d3 b1





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5	Pile cap - pile Foundation	6, 7, 10	C1 C4 C9 C12	a1 b1 c1 a2 b2 c2 a3 b3 c3 a1 d3 b1
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Course Coordinator: Dr. Hany Hashish **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Inland Navigation and Harbor Engineering (CIE506)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Inland Navigation and Harbor Engineering
Course Code	CIE506
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre-request	ENG301

Taashing houng	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims
6	Analyze data from the intended tests to manage resources creatively.
7	Achieve an optimum design of earth Retaining Structures
10	Select appropriate and sustainable technologies for construction of marine structures

3. Competencies:

Competencies	Learning outcomes (LO'S)	
C1 Identify, formulate, and solve complex	c1 Identify, formulate, and solve complex	
problems by applying engineering	problems by applying the concepts and the	
fundamentals, basic science, and mathematics.	theories of mathematics.	
C2 Analyze data, assess, and evaluate findings, and use statistical analyses and objective	b3 Analyze and interpret data	
hydrodynamics		
C3 Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, economic, environmental, ethical, and other aspects as appropriate the principles and contexts of sustainable design and development.	a1 Learn the general principles of design techniques specific to harbors and marine structures.	
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	a1 Describe quality assurance systems, codes of practice, and standards, as well as health and safety regulations and environmental concerns.	
C5 Practice research techniques and methods of	d1 Search for information to engage in lifelong	
investigation as an inherent part of learning.	self-learning discipline.	




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C6 Plan, supervise and monitor implementation	a1 Show the appropriate and sustainable			
of marine projects	technologies for construction of marine structures.			
C11 Select appropriate and sustainable technologies for construction of marine structures	 a1 Recognize the fundamentals of structural analysis. a2 Summarize, appropriate and sustainable technologies for construction of marine structures. c1 Using either numerical techniques or physical measurements and/or testing for coastal hydrodynamics 			
C12 Achieve an optimum design of marine structures and Harbors.	b1 Achieve an optimum design of marine structures.b2 Achieve an optimum design for works of harbors			
C13 Plan and manage construction processes and environmental impacts of projects.	c1 Assess environmental impacts of projects.			

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Wind and current – tide Wave theories	8	8	-
2	Surf zone hydrodynamics	2	2	-
3	Wave forces	4	4	-
5	Harbor planning	2	2	-
6	Design of breakwater	4	4	-
7	Design of quay walls	4	4	-
8	Ship repair structures	2	2	-
9	Inland navigation	2	2	-
	Total	28	28	-

5. Teaching and Learning Methods:

Topics	Face-to-face lecture	On line lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site Visits	Self learning and Research	Cooperative	Discovering	Modeling	Lab
Wind and current – Tide -Wave theories	X	X			X	X								
Surf zone hydrodynamics	X	X		X	X	X	X							
Wave forces	Х	Х			Х	Х								





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Harbor planning	x	x		x	x		x				
Design of breakwater	X	X	X	X	X						
Design of quay walls	X	X	X	X	X					X	
Ship repair structures	X	X		X	X			X	X		
Inland navigation	X	X		X	X	X					x

6. Teaching and Learning Methods of disabled Students:

No.	Teaching Method
1	Additional Tutorials
2	Online lectures and assignments

7. Student assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	Competencies	LOs
		C1	c1
		C2	b3
1	Mid Term Examination (written/ online)	C3	al
		C11	a2, c1
		C13	c1
2	Formative (quizzes, online quizzes, presentation)	C3	al
2	Formative (quizzes- onnine quizzes- presentation)	C4	al
		C3	al
		C4	al
2	Final Tarm Examination (written)	C5	d1
3	Final Term Examination (written)	C6	al
		C11	a2
		C12	b1, b2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination (written/ online)	8th
2	Practical/ Oral Examination	15th
3	Formative (quizzes- online quizzes presentation-	Every week
4	Final Term Examination (written)	Decided by Faculty Council

7.3 Weighting of Assessments:

No.	Assessment Method				
1	Mid Term Examination (written/ online)	20%			
2	Formative (quizzes- online quizzes presentation Tutorial and report assessment)	20%			





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3	Final Term Examination (written)	60%
	Total	100%

8. List of References:

Essential Books (Textbooks)	Carl A. Thoresen, port Designers Handbook Third edition, 2014.
Recommended books	Gregory Tsinker, Handbook of port and Harbor Engineering: Geotechnical and structural and structural Aspects, 2014.
Periodicals, Web sites, etc	Journal of Geotechnical Engineering (ASCE). Journal of Hydraulic Division (ASCE).

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	Lab Facilities
3	White Board
4	Data Show System
5	Presenter

10. Matrix of Knowledge and Skills of the Course

No.	Торіс	Aims	Competencies	LO's
1	Wind and current – Tide -Wave theories	1	C1 C2 C11 C13	c1 b3 a2 c1
2	Surf zone hydrodynamics	1	C11 C13	c1 c1
3	Wave forces	1	C3	al
4	Harbor planning	1	C5 C6 C11 C12	d1 a1 a2 b2
5	Design of breakwater	1	C12	b1
6	Design of quay walls	1	C4	al
7	Ship repair structures	1	C3	al
8	Inland navigation	1	C3	al

Course Coordinator: Prof. Dr. Osami Rageh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Project (1)</u> (CIE509)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Project (1)
Course Code	CIE509
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre- request	Complete 140 hr.

Taaabing boung	Lectures	Tutorial	Practical
reaching nours	2	-	2

2. Course Aims

No.	Aims
2	Work in and manage a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance; and behave professionally and adhere to
-	engineering ethics and standards.
5	Communicate effectively with a variety of audiences using a variety of forms, methods, and languages; cope with academic and professional issues in a critical and creative manner; and display leadership, business administration, and entrepreneurial abilities.
7	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.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
	al Define, basic characteristics, properties, concepts, and
	techniques of structural analysis and mechanics, properties
C2 Develop and conduct appropriate	and strength of materials, surveying, soil mechanics,
experimentation and/or simulation,	hydrology and fluid mechanics.
analyze and interpret data, assess,	a2 Define the principles, basic properties, and features of
and evaluate findings, and use	construction material, as well as their use in sustainable
statistical analyses and objective	technologies for construction of buildings, infrastructures,
engineering judgment to draw	and water structures.
conclusions.	b1 Conduct basic experiments to learn about the basic
	characteristics and features of structural analysis and
	mechanics, properties and strength of materials, surveying,
	soil mechanics, hydrology and fluid mechanics.





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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.	 b2 Conduct basic experiments to learn about the applications of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology, and fluid mechanics in the fields of transportation and traffic, roadways and airports, railways, sanitary works, irrigation, water resources and harbors, or any other emerging field relevant to the discipline. b3 Analyze and interpret data. b4 Evaluate components, systems, and processes are evaluated for their characteristics and performance. c1 Choose relevant mathematical and computer- based methodologies for problem modelling and analysis. c2 Develop suitable experimentation and/or simulation. c3 Applying statistical analyses and objective engineering judgment to draw conclusions. a1 Learn the general principles of design techniques specific to reinforced concrete and steel structures, foundations and earth retaining structures. a2 Understand the professional ethics and impacts of engineering solutions on society and environment. a3 Recognizes the various construction defects, instability and quality issues and assess environmental impacts of projects. b1 Judge engineering decisions considering.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	 a1 Describe quality assurance systems, codes of practice, and standards, as well as health and safety regulations and environmental concerns. a3 Define contemporary engineering technologies and their applications in relation to disciplines. c2 Use fundamental organizational and project management abilities. c3 Utilize modern technologies.
C5 Practice research techniques and methods of investigation as an inherent part of learning.	 b1 Assess different ideas, views, and knowledge from a range of sources. c1 Prepare technical reports. d1 Search for information to engage in lifelong self-learning discipline.
 C7 Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams. C8 Communicate effectively – 	 d1 Collaborate effectively within multidisciplinary team. d2 Work in stressful environment and within constraints. d3 Motivate individuals.
graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1 Communicate effectively.d2 Demonstrate efficient IT capabilities.





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C11 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.	 a1 Recognize the fundamentals of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology, and fluid mechanics. a2. Summarize, appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures. c1 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.
C12 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.	 b1 Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures. b2 Achieve an optimum design of works for transportation and traffic, roadways and airports, railways, sanitary works, irrigation, water resources and harbors, or any other emerging field relevant to the discipline.
C13 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.	 a1 define plain and mange construction process. b1 Address construction defects, instability, and quality issues c1 Assess environmental impacts of projects.
C14 Deal with biddings, contracts and financial issues including project insurance and guarantees.	 a1 define biddings, contracts, and financial issues. b1 Address biddings, contracts and financial issues including project insurance and guarantees. c1 Apply biddings, contracts, and financial issues on civil engineering projects

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	The graduation project aims to explore students' ability and skills to comprehensively address and manage architectural and technical issues associate with a large-scale design project	8	-	8
2	The project examines and measures students' knowledge, skills, and collective outputs gained throughout their study in the faculty and department in a combined manner, that reflects identity and creativity in all its preliminary and analytical phases.	10	-	10





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3	A complete set of appropriately presented drawings, accompanied by a detailed report of the project's attributable studies and potential considerations should be implemented by each student	10	-	10
	Total	28	-	28

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
The graduation project aims to explore students' ability and skills to comprehensively address and manage architectural and technical issues associated with a large- scale design pro	х			х	х	х			х		х			x
The project examines and measures students' knowledge, skills, and collective outputs gained throughout their study in the faculty and department in a combined manner, that reflects identity and creativity in all its preliminary and analytical phases.	x			х	x	x					x			x
A complete set of appropriately presented drawings, accompanied by a detailed report of the project's attributable studies and potential considerations should be	х			X	х	x					x			х



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implemented by each student				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
	Asking small groups to do assignments; each	Knowledge and skills transfer among
3	composed of low, medium, and high-performance	different levels of students
	students	

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C2	
		C3	a1, a2, b1, b2, b3, b4, c1, c2, c3
		C4	a1, a2, a3, b1
1	Oral Examination	C5	a1, a3, c2, c3
1	Oral Examination	C11	b1, c1
		C12	a1, a2, c1 b1, b2, a1, b1, c1
		C13	a1, b1, c1
		C14	
		C2	
		C3	
		C4	a1, a2, b1, b2, b3, b4, c1, c2, c3
		C5	a1, a2, a3, b1
2	Semester work	C8	a1, a3, c2, c3 b1, c1, d1
		C11	d1, d2
		C12	a1, a2, c1 b1, b2, a1, b1, c1 a1, b1, c1
		C13	
		C14	

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Oral Examination	at the end of CIE510
2	Semester work	2^{nd} -7 th - 9 th -14 th

7.3 Weighting of Evaluation:

Ν	Evaluation Method	Weights	
1	Oral Examination	50%	
2	Semester work (Presentation, Report)	50%	
	Total 100%		

8. List of References:

No.	Reference List
1	Subject studies





9. Facilities required for teaching and learning:

Facility				
1	Lecture classroom	3	White board	
2	Seminar	4	Data show system	
5	Lab.			

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	The graduation project aims to explore students' ability and skills to comprehensively address and manage architectural and technical issues associated with a large-scale design pro	2, 3, 5, 7, 8, 10	C2 C3 C4 C5 C11 C12	a1, a2, b1, b3, b4, c1, c2 a1, a2, a3, b1 a1, a3, c2, c3 b1, c1 a1, a2, c1 b1, b2
2	The project examines and measures students' knowledge, skills, and collective outputs gained throughout their study in the faculty and department in a combined manner, that reflects identity and creativity in all its preliminary and analytical phases.	2, 3, 5, 7, 8, 10	C4 C5 C8 C11 C12 C13 C14	a1, a3, c2, c3 b1, c1, d1 d1, d2 a1, a2, c1 b1, b2 a1, b1, c1 a1, b1, c1
3	A complete set of appropriately presented drawings, accompanied by a detailed report of the project's attributable studies and potential considerations should be implemented by each student	2, 3, 5, 7, 8, 10	C3 C4 C5 C8 C11 C12 C13 C14	a1, a2, a3, b1 a1, a3, c2, c3 b1, c1, d1 d1, d2 a1, a2, c1 b1, b2 a1, b1, c1 a1, b1, c1

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Project (2)</u> (CIE510)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Project (2)
Course Code	CIE510
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre- request	CIE509

Tasahing houng	Lectures	Tutorial	Practical	
reaching nours	1	4	-	

2. Course Aims

No.	Aims
2	Work in and manage a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance; and behave professionally and adhere to engineering ethics and standards.
3	Recognize his or her role in promoting engineering and contributing to the profession's and community's development; by appreciating the importance of the environment, both physical and natural, and working to promote sustainability concepts;
5	Communicate effectively with a variety of audiences using a variety of forms, methods, and languages; cope with academic and professional issues in a critical and creative manner; and display leadership, business administration, and entrepreneurial abilities.
7	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	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures, using numerical techniques, experiment measurements, and testing by applying a full range of civil engineering fields such as structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology and fluid mechanics.

3. Competencies:

Competencies	Learning Outcomes (LO'S)		
C2 Develop and conduct appropriate	al Define, basic characteristics, properties, concepts,		
experimentation and/or simulation, analyze	and techniques of structural analysis and mechanics,		
and interpret data, assess, and evaluate	properties and strength of materials, surveying, soil		
findings, and use statistical analyses and	mechanics, hydrology and fluid mechanics.		
objective engineering judgment to draw	a2 Define the principles, basic properties, and		
conclusions	features of construction material, as well as their use		





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	in sustainable technologies for construction of buildings, infrastructures, and water structures.
	b1 Conduct basic experiments to learn about the basic
	characteristics and features of structural analysis and
	mechanics, properties and strength of materials,
	surveying, soil mechanics, hydrology, and fluid
	mechanics.
	b2 Conduct basic experiments to learn about the
	applications of structural analysis and mechanics,
	properties and strength of materials, surveying, soil
	mechanics, hydrology and fluid mechanics in the
	fields of transportation and traffic, foadways and
	airports, ranways, sanitary works, irrigation, water
	relevant to the discipline
	b3 Analyze and interpret data
	b4 Evaluate components systems and processes are
	evaluated for their characteristics and performance.
	c1 Choose relevant mathematical and computer-
	based methodologies for problem modelling and
	analysis.
	c2 Develop suitable experimentation and/or
	simulation.
	c3 Applying statistical analyses and objective
	engineering judgment to draw conclusions.
	al Learn the general principles of design techniques
C3 Apply engineering design processes to	specific to reinforced concrete and steel structures,
produce cost-effective solutions that meet	foundations and earth retaining structures.
specified needs with consideration for	a2 Understand the professional ethics and impacts of
global, cultural, social, economic,	a Bassenizes, the various construction defects
appropriate to the discipline and within the	as Recognizes the various construction defects,
principles and contexts of sustainable design	environmental impacts of projects
and development.	b1 Judge engineering decisions considering.
	balanced costs, benefits, safety, quality
	al Describe quality assurance systems, codes of
CALITIZZ contemporent technologies codes	practice, and standards, as well as health and safety
of prostice and standards, quality guidelines	regulations and environmental concerns.
be be altheside and safety requirements	a3 Define contemporary engineering technologies
environmental issues and risk management	and their applications in relation to disciplines.
principles.	c2 Use fundamental organizational and project
	management abilities.
C5 Describes assessed to sharing and motheda	cs Utilize modern technologies.
of investigation as an inherent part of	b1 Assess different ideas, views, and knowledge from
learning	a range of sources.
lourning.	c1 Prepare technical reports.





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	d1 Search for information to engage in lifelong self-learning discipline.
C7 Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	 d1 Collaborate effectively within multidisciplinary team. d2 Work in stressful environment and within constraints. d3 Motivate individuals.
C8 Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	d1 Communicate effectively.d2 Demonstrate efficient IT capabilities
C11 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.	 a1 Recognize the fundamentals of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology, and fluid mechanics. a2 Summarize, appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures. c1 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.
C12 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.	 b1 Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures. b2 Achieve an optimum design of works for transportation and traffic, roadways and airports, railways, sanitary works, irrigation, water resources and harbors, or any other emerging field relevant to the discipline.
C13 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.	 a1 define plain and mange construction process. b1 Address construction defects, instability, and quality issues c1 Assess environmental impacts of projects.
C14 Deal with biddings, contracts and financial issues including project insurance and guarantees.	 a1 define biddings, contracts, and financial issues. b1 Address biddings, contracts and financial issues including project insurance and guarantees. c1 Apply biddings, contracts, and financial issues on civil engineering projects





4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Continuation and conclusion of the investigations on the			
	civil engineering problems of Project I; written reports and	14	56	-
	team presentations are required.			
	Total	14	56	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	dal
Continuation and conclusion of the investigations on the civil industrial problems of Project I; written reports and team presentation are required.		X		X	X	X					X			X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason		
1	Presentation of the course in digital material	Better access any time		
2	Wed communication with students	Better communication with certain cases		
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students		

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1		C3	a1, a2, a3, b1
		C4	a1, a3, c2, c3
	Oral Examination C11 C12 C13 C14	C11	a1, a2, c1
		C12	b1, b2
		C13	a1, b1, c1
		C14	a1, b1, c1



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		C3	a1, a2, a3, b1
2 Semester work	C4	a1, a3, c2, c3	
	C11	a1, a2, c1	
	C12	b1, b2	
		C13	a1, b1, c1
	C14	a1, b1, c1	
3	Report evaluation	C5	b1, c1, d1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Oral Examination	at the end of IE 510
2	Semester work	2nd -7th - 9th -14th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Oral Examination	50%
2	Semester work (Presentation, Report)	50%
	Total	100%

8. List of References:

No.	Reference List
1	Subject studies

9. Facilities required for teaching and learning:

	facility					
1	Lecture classroom	3	White board			
2	Seminar	4	Data show system			
5	Lab.					

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Continuation and conclusion of the investigations on the chemical industrial problems of Project I; written reports and	2, 3, 5, 7, 8, 10	C3 C4 C5 C11	a1, a2, a3, b1 a1, a3, c2, c3 b1, c1, d1 a1, a2, c1
	team presentation are required.		C12 C13	b1, b2 a1, b1, c1
			C14	a1, b1, c1

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022







Bridge Engineering (CIE511)

1. Basic Information:

Civil Engineering Program
Civil Engineering Department
Civil Engineering Department
Bridge Engineering
CIE511
Level 5
Major
-
Complete 100 h

Teaching hours	Lectures	Tutorial	Practical	
	2	2	-	

2. Course Aims:

No.	Aims
4	Use the techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development, participating in lifelong learning, and demonstrating the ability to pursue postgraduate and research studies.
7	Achieve an optimum design for bridges, by using elastic theory and practical methods for analysis and design bridges.
10	Use the techniques, skills, and codes of practice effectively and professionally in designing bridges.

3. Intended Learning Outcomes (LO'S):

Competencies	Learning Outcomes (LO'S)				
C2 Develop and conduct appropriate	al Define, basic characteristics, properties,				
experimentation and/or simulation, analyze and	concepts, and techniques of: structural analysis				
interpret data, assess, and evaluate findings, and	and mechanics, properties and strength of				
use statistical analyses and objective engineering	materials.				
judgment to draw conclusions.	b3 Analyze and interpret data				
C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to	d1 Think creatively in solving problems of				
anticipate and respond to new situations.	design.				
C12 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	h1 A chieve an optimum design of bridges				
and Traffic, Roadways and Airports, Railways,					
Sanitary Works, Irrigation, Water Resources and					
Harbors; or any other emerging field relevant to					
the discipline.					





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4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Different types of bridges.	4	4	-
	Planning of bridges:	4	4	-
2	- Parts of bridges.			
	- Layout of bridges.			
3	Load calculations and its different effects.	4	4	-
1	Methods of bridge design using the standard	10	10	-
4	specifications codes.			
5	Using commercial computer packages for	2	2	-
5	bridge design.			
6	Different construction methods in bridges.	4	4	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and	Cooperative	Discovering	Modeling	Lab
Different types of bridges.	x			x	x									x
Planning of bridges: Parts of bridges - Layout of bridges.	x			x	x									x
Load calculations and its different effects.	x			x	x									x
Methods of bridge design using the standard specifications codes.	x			x	x									x
Using commercial computer packages for bridge design.	x			x	x					x				x
Different construction methods in bridges.	x			x	X					x				X

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different level of students.

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C2	a1, b3





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		C9	d1
		C12	b1
		C2	a1, b3, c1
2	Semester work (quizzes, sheets, report)	C9	d1
		C12	b1
		C2	a1, b3
3	Final term examination	C9	d1
		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks					
1	Midterm examination	8 th					
2	Semester work	continuous evaluation					
3	Final term examination	15 th					

7.3 Weighting of Evaluation:

No.	Evaluation method	Weights		
1	Mid-term examination	20%		
2	Semester work	20%		
3	Final-term examination	60%		
Total 100%				

8. List of References:

No.	Reference List
1	Course notes:
	• Lecture notes prepared by the course coordinator.
	• Solved examples.
2	Essential books (textbooks):
	• Egyptian Code of Practice for Steel Construction and Bridges (ASD), Code No. 205, HBRC, 2003.
	• Egyptian Code for Planning, Design & Construction of Bridges and Elevated Intersections, Code No. 207-2001, HBRC, 2015.
3	Recommended books:
	• John F. Unsworth, "Design and Construction of Modern Steel Railway Bridges", 2nd Ed.,
	CRC Press, 2018.
	• Metwally Abu-Hamd "Steel Bridges", Cairo University, 2010.
4	Periodicals, Web sites, etc.
	o www.bridgeweb.com
	 www.bridgeengineer.org

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system





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10.	Matrix of knowledge and skills of the course:					
No	Торіс	Aims	Competencies	LO's		
1	Different types of bridges.	4	C2	a1, b3		
2	Planning of bridges: - Parts of bridges. - Layout of bridges.	4,7	C2, C9	a1, b3 d1		
3	Load calculations and its different effects.	7,10	C2, C9,	a1, b3 d1		
4	Methods of bridge design using the standard specifications codes.	7,10	C2, C9, C12	a1, b3 d1 b1		
5	Using commercial computer packages for bridge design.	7,10	C2, C9, C12	c1 d1 b1		
6	Different construction methods in bridges.	4	C2, C9,	a1, b3 d1		

Course Coordinator: Assoc. Prof. Dr. Ashraf Elsabagh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Coastal Engineering Fundamentals</u> (CIE512)

1. Basic Information

Program Title	Civil Engineering Program		
Department Offering the Program	Civil Engineering Department		
Department Responsible for the Course	Civil Engineering Department		
Course Title	Coastal Engineering Fundamentals		
Course Code	CIE512		
Year/Level	Level 5		
Specialization	Major		
Authorization Date of Course Specification	-		
Pre-request	Complete 100 h		

Taaahing haung	Lectures	Tutorial	Practical	
l eaching nours	2	2	-	

2. Course Aims:

No.	Aims					
4	Apply knowledge of mathematics, science, engineering concepts, and construct structures to					
4	solve fundamental engineering problems for design harbors and marine structures.					
7	Achieve an optimum design of coastal protection structures.					
10	Select appropriate and sustainable technologies for construction of coastal protection					
10	structures					

3. Competencies:

Competencies	Learning outcomes (LO'S)
C2 Develop and conduct appropriate analyze	b4 Evaluate components, systems, and processes
and interpret data and use statistical analyses to	are evaluated for their characteristics and
draw conclusions.	performance.
C3 Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, economic, environmental, ethical, and other aspects as appropriate the principles and contexts of sustainable design and development.	a1 Learn the general principles of design techniques specific to harbors and marine structures.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	a1 Describe quality assurance systems, codes of practice, and standards, as well as health and safety regulations and environmental concerns.
C11 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	a1 Recognize the fundamentals of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology, and fluid mechanics.





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structural analysis and mechanics, properties and	a2 Summarize, appropriate and sustainable
strength of materials, surveying, soil mechanics,	technologies for construction of marine
hydrology and fluid mechanics.	structures.
	c1 Using either numerical techniques or physical
	measurements and/or testing for coastal
	hydrodynamics
C12 Achieve an optimum design of marine	b1 Achieve an optimum design of marine
structures and Harbors.	structures.
C13 Plan and manage construction processes;	
address construction defects, instability, and	
quality issues; maintain safety measures in	c1 Assess environmental impacts of projects.
construction and materials; and assess	
environmental impacts of projects.	

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Effect of waves on coastal structures	6	6	-
2	design of seawalls, jetties, harbors, ship channels and pipelines	6	6	-
3	diffusion and spreading	4	4	-
4	oil spill containment and collection	6	6	-
6	Analysis of wave data.	6	6	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face-to-face lecture	Online lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site Visits	Self learning and Research	Cooperative	Discovering	Modeling	Lab
Effect of waves on coastal structures	X	X			X	X								
design of seawalls, jetties,	X	X		X	X	X	X						X	





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harbors, ship channels and pipelines										
diffusion and spreading	X	X		X	X		X			
oil spill containment and collection	X	X		X	X		X			
Analysis of wave data.	X	X	X	X	X					

6. Teaching and learning methods for disabled students:

No.	Teaching Method
1	Additional Tutorials
2	Online lectures and assignments

7. Student assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	Competencies	LOs
1	Mid Term Examination (written/ online)	C11	a2, c1
1	Wild Term Examination (written/ onnine)	C13	c1
2	Formative (quizzes, online quizzes, presentation)	C3	al
2	Formative (quizzes- onnine quizzes- presentation)	C4	a1
		C3	al
		C4	a1
3	Final Term Examination (written)	C11	a1, a2, c1
		C12	b1, b2
		C13	c1

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination (written/ online)	8th
2	Practical/ Oral Examination	15th
3	Formative (quizzes- online quizzes presentation-Tutorial and report assessment)	Every week
4	Final Term Examination (written)	Decided by Faculty Council

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination (written/ online)	20%
2	Formative (quizzes- online quizzes presentation-	20%
3	Final Term Examination (written)	60%
	Total	100%





8. List of References:

No.	Reference List
1	الكود المصرى للموارد المائيه وأعمال الري المجلد السابع الطبعه الأولى 2003
2	Carl A. Thoresen, port Designers Handbook Third edition, 2018.
3	Gregory Tsinker, Handbook of port and Harbor Engineering: Geotechnical and structural and structural Aspects, 2018.
4	Journal of Geotechnical Engineering (ASCE).
5	Journal of Hydraulic Division (ASCE).

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	Lab Facilities
3	White Board
4	Data Show System
5	Presenter

10. Matrix of knowledge and skills of the course:

No.	Торіс	Aims	Competencies	LO's
1	Effect of waves on coastal structures	1	C11	a2
1	Effect of waves on coastal structures	1	C13	c1
2	Design of seawalls, jetties, harbors, ship channels and pipelines	1	C4	al
3	Diffusion and spreading	1	C11	c 1
5		1	C13	c1
1	Oil will containment and collection	1	C11	al
4	On spin containment and conection	1	C12	b1
5	Analysis of wave date	1	C3	al
5	Analysis of wave data.	1	C2	b4

Course Coordinator: Prof. Dr. Osami Rageh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Concrete Structures Technology</u> (CIE513)

1. Basic Information:

Program Title	Civil Engineering Program		
Department Offering the Program	Civil Engineering Department		
Department Responsible for the Course	Civil Engineering Department		
Course Title	Concrete Structure Technology		
Course Code	CIE513		
Year/Level	Level 5		
Specialization	Minor – Elective Course		
Authorization Date of Course Specification	-		
Pre- request	Complete 100 h		

Teeching hours	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims
	Select appropriate and sustainable technologies for construction of buildings, infrastructures,
8	and water structures, using numerical techniques, experiment measurements, and testing by
	applying a full range of civil engineering fields such as properties and strength of materials
	Select appropriate and sustainable technologies for construction of buildings, infrastructures,
10	and water structures, using numerical techniques, experiment measurements, and testing by
	applying a full range of civil engineering fields such as properties and strength of materials

3. Competencies:

Competencies	Learning Outcomes (LO'S)
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	a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	 a1 Describe codes of practice, and standards, as well as health and safety regulations. a3 Define contemporary engineering technologies and their applications in relation to disciplines.
C11 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 properties and strength of materials	 a1 Recognize the fundamentals of properties and strength of materials. a2 Summarize, appropriate and sustainable technologies for construction of buildings,





4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Advantages and limitations of concrete, types of cements admixtures, batching equipment, types of mixers, ready mixed concrete, pumping equipment, slip forming, concreting	8	8	-
2	Casting in lifts, finishing concrete, hot weather concreting, formwork design, methods of curing, strength of concrete, destructive and nondestructive testing of concrete	12	12	-
3	Durability, repair, and maintenance of concrete.	8	8	-
	Total	28	28	_

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Advantages and limitations of concrete, types of cements admixtures, batching equipment, types of mixers, ready mixed concrete, pumping equipment, slip forming, concreting	\checkmark			\checkmark	\checkmark	\checkmark	\checkmark						\checkmark	
Casting in lifts, finishing concrete, hot weather concreting, formwork design, methods of curing, strength of	\checkmark				\checkmark	\checkmark	\checkmark			\checkmark			\checkmark	







concrete, destructive and nondestructive testing of concrete									
Durability, repair, and maintenance of concrete.	\checkmark		\checkmark	\checkmark	\checkmark				\checkmark

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C2 C11	a2 a1, a2
2	Semester work (quizzes, sheets, report)	C4 C11	a1 a3 a1 a2
3	Final term examination	C2 C4 C11	a 2 a1, a3 a1, a2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8th
2	Semester work	all
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights								
1	Midterm examination	20%								
2	Semester work	20%								
3	Final term examination	60%								
	Total	100%								

8. List of References:

Reference List
Eric Fleming (2018), construction technology an illustrated introduction, black well publishing.
محمود امام ومحمد امين "خواص ومقاومة المواد" – الجزء الثاني ، كلية الهندسة جامعة المنصورة.







"الكود المصرى لتصميم وتنفيذ المنشآت الخرسانية المسلحة كود رقم203" التحديث الثانى(2018) وزارة الإسكان والمرافق والمجتمعات العمرانية – مركز بحوث الإسكان والبناء والتخطيط العمراني – جمهورية مصر العربية.

9. Facilities required for teaching and learning:

Facility								
1	Lecture classroom	3	White board					
2	Seminar	4	Data show system					

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Advantages and limitations of concrete, types of cements and admixtures, batching equipment, types of mixers, ready-mixed concrete, pumping equipment, slip forming, concreting	8,10	C4 C11	a3, a1 a1, a2
2	Casting in lifts, finishing concrete, hot weather concreting, formwork design, methods of curing, strength of concrete, destructive and nondestructive testing of concrete	8,10	C4 C11 C2	a 3, a 1 a1 a2 a2
3	Durability, repair, and maintenance of concrete.	8,10	C11 C2	a1, a2 a 2

Course Coordinator: Dr. Nesreen Elawadly **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Construction Contracting</u> (CIE514)

1. Basic Information

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Construction Contracting
Course Code	CIE514
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Taaabing Houng	Lectures	Tutorial	Practical		
reaching Hours	2	2	-		

2. Course Aims:

No.	Aims
6	Analyze data from the intended tests to manage resources creatively.
8	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.
9	Deal with biddings, contracts, and financial issues including project insurance and guarantees.

3. Competencies:

Competencies	Learning Outcomes (LOs)							
C3 Apply engineering design processes to	b1 Judge engineering decisions considering							
produce cost-effective solutions that meet	balanced costs, benefits, safety, quality,							
specified needs with consideration for global,	reliability, and environmental impact.							
cultural, social, economic, environmental,	c2 Applying engineering design procedures to							
ethical, and other aspects as appropriate to the	generate cost-effective solutions while adhering							
discipline, and within the principles and contexts	to sustainable design and development principles							
of sustainable design and development.	and contexts.							
C9 Use creative, innovative, and flexible								
thinking and acquire entrepreneurial and	d2 Effectively manage tasks, time, and							
leadership skills to anticipate and respond to new	resources.							
situations.								
C13 Plan and manage construction processes;								
address construction defects, instability, and	al Define the plan and manage the construction							
quality issues; maintain safety measures in	process							
construction and materials; and assess the	process.							
environmental impacts of projects.								
C14 Deal with biddings, contracts, and financial	al Define hiddings contracts and financial							
issues including project insurance and	issues							
guarantees.	155005.							









b1 Address biddings, contracts, and financial
issues including project insurance and
guarantees.
c1 Apply biddings, contracts, and financial
issues on civil engineering projects.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Construction Contracting for Contracts, Architects, and	2	2	-
	Owners			
2	Organization and Administration Industry Structure	2	2	-
3	Construction Contracts, Bonds, and Insurance	2	2	-
4	Planning, Estimating, and Control	4	4	-
5	Quantity Takeoff and Pricing	4	4	-
6	Labor, Equipment, Excavation and Concrete Estimate	6	6	-
7	Proposal Preparation	2	2	-
8	Scheduling, Accounting, and Cost Control	4	4	-
9	Contract Documents to Prepare Detailed Estimate	2	2	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Construction Contracting for Contracts, Architects, and Owners		\checkmark			\checkmark									
2	Organization and Administration Industry Structure	\checkmark			\checkmark										
3	Construction Contracts, Bonds, and Insurance		\checkmark			\checkmark									
4	Planning, Estimating, and Control														





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5	Quantity Takeoff								
-	and Pricing								
	Labor, Equipment,								
6	Excavation and								
	Concrete Estimate								
Π	Proposal								
/	Preparation	N				N			
	Scheduling,								
8	Accounting, and								
	Cost Control								
	Contract								
9	Documents to	./		./					
	Prepare Detailed	N		N					
	Estimate								

6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason	
1	Presentation of The Course in Digital Material	Better Access at Any Time	
2	Wed Communication with Students	Better Communication with Certain Cases	
2	Asking Small Groups to Do Assignments; Each	Knowledge and Skills Transfer Among	
3	Composed of Low, Medium, and High-	Different Levels of Students	
4	An Electronic Model System for The Institution	E. Learning	

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C3	b1, c2
1	Semester Works (Quizzes, Sheets, Reports)	C9	d2
1		C13	a1
		C14	a1, b1, c1
2	Mid-Term Exam	C9	d2
		C13	a1
		C14	a1, b1, c1
	Final-Term Exam	C3	b1, c2
3		C9	d2
		C13	al
		C14	a1. b1. c1

7.2 Evaluation Schedule:

/.2 EV	7.2 Evaluation Schedule.		
No.	Evaluation Method	Weeks	
1	Semester Works (Quizzes, Sheets, Reports)	$4^{\text{th}}, 11^{\text{th}}$	
2	Mid-Term Exam	8 th	
3	Final-Term Exam	15 th	
7.3 Weighting of Evaluation:			
No.	Evaluation Method	Weights	
4		0.00/	

INO.	Evaluation Method	weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%





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3	Final-Term Exam	60%
Total		100%

8. List of References:

No.	Reference List
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and
1	Development. Chartered Institute of Building (Great Britain).
2	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,
2	Scheduling, and Control.
2	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and
3	Architects.
4	Project Management Institute and Project Management Institute. A Guide to the Project
4	Management Body of Knowledge (PMBOK Guide).
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,
3	Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.

9. Facilities Required for Teaching and Learning:

Facility			
1	Lecture Classroom	3	White Board
2	Seminar	4	Data Show System

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
1	Construction Contracting for Contracts, Architects, and Owners	9	C14	a1, b1, c1
2	Organization and Administration Industry Structure	6, 8	C9 C13	d2 a1
3	Construction Contracts, Bonds, and Insurance	9	C14	a1, b1, c1
4	Planning, Estimating, and Control	6, 8	C9 C13	d2 a1
5	Quantity Takeoff and Pricing	6, 8	C3 C9 C13	b1, c2 d2 a1
6	Labor, Equipment, Excavation and Concrete Estimate	6, 8	C3 C9 C13	b1, c2 d2 a1
7	Proposal Preparation	9	C14	a1, b1, c1
8	Scheduling, Accounting, and Cost Control	6, 8	C3 C9 C13	b1, c2 d2 a1
9	Contract Documents to Prepare Detailed Estimate	9	C14	a1, b1, c1

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Cost Analysis for Structure Projects</u> (CIE515)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Cost Analysis for Structure Projects
Course Code	CIE515
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Teeching Houng	Lectures	Tutorial	Practical
Teaching Hours	2	2	-

2. Course Aims:

No.	Aims
6	Analyze data from the intended tests to manage resources creatively.
8	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.

3. Competencies:

Competencies	Learning Outcomes (LOs)		
C3 Apply engineering design processes	b1 Judge engineering decisions considering balanced		
to produce cost-effective solutions that	costs, benefits, safety, quality, reliability, and		
meet specified needs with consideration	environmental impact.		
for global, cultural, social, economic,	c1 Incorporate economic, societal, global,		
environmental, ethical, and other aspects	environmental, and risk management factors into design.		
as appropriate to the discipline, and	c2 Applying engineering design procedures to generate		
within the principles and contexts of	cost-effective solutions while adhering to sustainable		
sustainable design and development.	design and development principles and contexts.		
C5 Practice research techniques and			
methods of investigation as an inherent	c1 Prepare technical reports.		
part of learning.			
C9 Use creative, innovative, and flexible			
thinking and acquire entrepreneurial and	d) Effectively menors tasks time and resources		
leadership skills to anticipate and	uz Effectively manage tasks, time, and resources.		
respond to new situations.			
C13 Plan and manage construction			
processes; address construction defects,	al Define the plan and manage the construction process		
instability, and quality issues; maintain	at Define the plan and manage the construction process.		
safety measures in construction and			





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materials; and assess the environmental	
impacts of projects.	

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Direct and Indirect Costs	4	4	-
2	Collective Systems, and Comparisons Between Projects	8	8	-
3	Fundamentals of Cost Analysis for Wood, Steel, and Concrete Buildings	6	6	-
4	Preparing Projects and Report Writing	6	6	-
5	Case Study	4	4	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Direct and Indirect Costs														
2	Collective Systems, and Comparisons Between Projects		\checkmark		\checkmark										
3	Fundamentals of Cost Analysis for Wood, Steel, and Concrete Buildings		\checkmark				\checkmark								
4	Preparing Projects and Report Writing														
5	Case Study														

6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases
3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students





4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C3	b1, c1, c2
1	Semester Works (Quizzes, Sheets, Reports)	C5	c1
		C9	d2
		C13	a1
		C3	b1, c1, c2
2	Mid-Term Exam	C9	d2
		C13	al
		C3	b1, c1, c2
3	Einel Terrer Errer	C5	c1
		С9	d2
		C13	al

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	4 th , 11 th
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th
7.3 W	eighting of Evaluation:	
No.	Evaluation Method	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
	Total	100%

8. List of References:

No.	Reference List
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and
1	Development. Chartered Institute of Building (Great Britain).
ſ	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,
2	Scheduling, and Control.
2	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and
3	Architects.
1	Project Management Institute and Project Management Institute. A Guide to the Project
4	Management Body of Knowledge (PMBOK Guide).
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,
3	Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.

9. Facilities Required for Teaching and Learning:

	(
1 Lecture Classroom 3 White Board	





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 2
 Seminar
 4
 Data Show System

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
1	Direct and Indirect Costs	6, 8	C3	b1, c1, c2
2	Collective Systems, and Comparisons Between Projects	6, 8	C3 C9 C13	b1, c1, c2 d2 a1
3	Fundamentals of Cost Analysis for Wood, Steel, and Concrete Buildings	6, 8	C3 C9 C13	b1, c1, c2 d2 a1
4	Preparing Projects and Report Writing	6, 8	C5	c1
5	Case Study	6, 8	C3 C5 C9 C13	b1, c1, c2 c1 d2 a1

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Design of Earthquake Structures (CIE516)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Design of Earthquake Structures
Course Code	CIE516
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre-request	Complete 100 h

Taaaking haung	Lectures	Tutorial	Practical
l eaching hours	2	2	-

2. Course Aims:

No.	Aims
7	Achieve an optimum design of Reinforced Concrete and Steel Structures, by using elastic
	theory and practical methods for analysis and design earthquake structures.
10	Use the techniques, skills, and codes of practice effectively and professionally in Designing
	earthquake structures.

3. Intended Learning Outcomes (LO'S):

Competencies	Learning Outcomes (LO'S)
C6 Plan, supervise and monitor implementation of	al Show the appropriate and sustainable
engineering projects, taking into consideration other	technologies for design of reinforced
trades requirements.	concrete and metallic structures.
C11 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, budrelogy and fluid mechanics	 a1 Recognize the different engineering principles related to the design of reinforced concrete and metallic structures to geotechnical and foundations. a2 Summarize, appropriate and sustainable technologies for construction and design of reinforced concrete and metallic structures to geotechnical and foundations.
C12 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.	b1 Achieve an optimum design of reinforced concrete and metallic structures to geo-technical and foundations



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4.	Course Contents:			
No.	Topics	Lectures	Tutorial	Practical
1	Causes of earthquakes	2	2	-
2	Seismic waves, scales of earthquakes	4	4	-
3	Equation of motion for single degree of freedom and multi- degree of freedom systems	4	4	-
4	Structural behavior under random forces	4	4	-
5	Spectral analysis depending on soil conditions	4	4	-
6	Modal analysis for multi strong buildings	4	4	-
7	Design principles for earthquake structures according to the Egyptian code	6	6	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	lab
Causes of earthquakes	х	X			X	x	X							
Seismic waves, scales of earthquakes	х	x			x	X	x							
Equation of motion for single degree of freedom and multi-degree of freedom systems	X	X			x	X	X							
Structural behavior under random forces	X	X			X	X	X							
Spectral analysis depending on soil conditions	X	x			X	X	X							
Modal analysis for multi strong buildings	x	x			x	X	X							
Design principles for earthquake structures according to the Egyptian code	X	X			x	X	X							




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6.	Teaching and learning methods for disabled students	s:
No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed	Knowledge and skills transfer
2	of low, medium, and high-performance students.	among different level of students.

7. Student evaluation:

7.1 Student evaluation method:

	dent evaluation method.		
No.	Evaluation Method	Competencies	LO's
1	Mid Torm Examination	C6	al
1		C11	al
2	Semester work	C11	a1, a2
		C6	al
3	Final Term Examination	C11	a1, a2
		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work	2nd,7th, 9th
2	Mid Term examination	8th
3	Final term examination	15 <i>th</i>

7.3 Weighting of Evaluation:

No.	Evaluation method	Weights	
1	Mid-term examination	20%	
2	Semester work	20%	
3	Final-term examination	60%	
	Total 100%		

8. List of References:

No.	Reference List	
1	Course notes: Are delivered during the lecture, including handout materials such as solved problems, design charts, tables, etc.	
2	Essential books (textbooks / design codes): Egyptian Code for Design and Construction of Reinforced Concrete Structures 2032001. Design Aids and Examples in Accordance with the Egyptian Code for Design and Construction of Reinforced Concrete Structures 203-2018. Seismic Design of Concrete Buildings to Eurocode, Michael Fardis, Eduardo ,Carvalho · Peter Fajfar 2018 Seismic Isolation, Structural Health Monitoring, Azer A. Kasimzade, Erdal Şafak, Carlos · E. Ventura 2018 Structural Dynamics in Earthquake and Blast Resistant Design, BK Raghu Prasad · 2020	
3	Recommended books: Chu-Kia Wang and Charles G. Salmon, "Reinforced Concrete Design," 4th Edition, Harper and Row Publishers, New York, 2018.	





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No. Facility 1 Lecture classroom 2 Seminar	
1 Lecture classroom 2 Seminar	
2 Seminar	
3 White board	
4 Data show system	

10. Matrix of knowledge and skills of the course:

No.	Торіс	Aims	Competencies	LO's
1	Causes of earthquakes	7	C6	al
2	Seismic waves, scales of earthquakes	10	C11	al
3	Equation of motion for single degree of freedom and multi-degree of freedom systems	10	C11 C12	al al, bl
4	Structural behavior under random forces	10	C11	a2
5	Spectral analysis depending on soil conditions	10	C11	al
6	Modal analysis for multi strong buildings	10	C11	a1, a2
7	Design principles for earthquake structures according to the Egyptian code	10	C12	a1, b1

Course Coordinator: Dr. Rafeek Wadieh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Design of Marine Platforms (CIE517)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Design of Marine Platforms
Course Code	CIE517
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre-request	Complete 100 h

Tasahing haung	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims
4	Apply knowledge of mathematics, science, engineering concepts, and construct structures to solve fundamental engineering problems for design harbors and marine structures.
7	Achieve an optimum design of marine platforms
10	Select appropriate and sustainable technologies for construction of of marine platforms

3. Competencies:

Competencies	Learning outcomes (LO'S)
C2 Develop and conduct appropriate analyze and interpret for coastal data to draw conclusions.	b3 Analyze and interpret data
C3 Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, economic, environmental, ethical, and other aspects as appropriate the principles and contexts of sustainable design and development.	a1 Learn the general principles of design techniques specific to harbors and marine structures.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	a1 Describe quality assurance systems, codes of practice, and standards, as well as health and safety regulations and environmental concerns.
C6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other requirements	a1 Show the appropriate and sustainable technologies for construction of marine platforms
C11 Select appropriate and sustainable technologies for construction of marine platforms	a2 Summarize, appropriate and sustainable technologies for construction of marine structures.





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C12 Achieve an optimum design of marine structures	b1 Achieve an optimum design of marin
and Harbors.	structures.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Marine platform (definition – types)	6	6	-
2	Loads affecting the marine platforms – tide and wind forces	8	8	
2	Loads affecting the marine platforms	6	6	-
3	Design of fixed marine platforms	8	8	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face-to-face lecture	Online lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site Visits	Self learning and Research	Cooperative	Discovering	Modeling	Lab
Marine platform (definition – types)	x	x			x	x								
Loads affecting the marine platforms – tide and wind forces	X	X		X	X	X								
Loads affecting the marine platforms	X	X			X	X								
Design of fixed marine platforms	X	X			X	X								

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material.	Better access any time.
n	Asking small groups to do assignments; each composed	Knowledge and skills transfer among
2	of low, medium, and high-performance students.	different levels of students.

7. Student assessment:

7.1 Student Assessment Methods:

No.	Evaluation Method	Competencies	LOs
1	Mid Term Examination (written/ online)	C11	a2





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2	Formative (quizzes- online quizzes- presentation)	C12 C3 C4	b2 al al
3	Final Term Examination (written)	C3 C4 C11	a1 a1 a2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination (written/ online)	8th
2	Practical/ Oral Examination	15th
3	Formative (quizzes- online quizzes presentation-Tutorial and report assessment)	Every week
4	Final Term Examination (written)	Decided by Faculty Council

7.3 Weighting of Assessments:

No. Assessment Method					
1	Mid Term Examination (written/ online)	20%			
2	Formative (quizzes- online quizzes presentation Tutorial and report assessment)	20%			
3	3 Final Term Examination (written)				
	Total				

8. List of References:

No.	Reference List
1	Carl A. Thoresen, port Designers Handbook Third edition, 2018
2	Gregory Tsinker, Handbook of port and Harbor Engineering: Geotechnical and structural and structural Aspects, 2018.

9. Facilities required for teaching and learning:

No.	Facility
1	Seminar
2	White Board
3	Data Show system

10. Matrix of knowledge and skills of the course:

No.	Торіс	Aims	Competencies	LO's
1	Marine platform (definition types)	1	C11	a2
1	Marine plationin (definition – types)	1	C12	b1
2	2 I as de offentine the marine platformer, tide on devia d former		C3	al
Z	Loads affecting the marine platforms – tide and wind forces	1	C11	a2
2	leads offerting the manine aletterman	1	C3	al
3	loads affecting the marine platforms	1	C2	b3
1	design of fixed marine platforms	1	C4	a1
4			C6	al





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Course Coordinator: Prof. Dr. Osami Rageh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Design of Shell Structures (CIE519)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Design of Shell Structures
Course Code	CIE519
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre-request	Complete 100 h

Taaahing hours	Lectures	Tutorial	Practical
reaching nours	2	1	-

2. Course Aims:

No.	Aims
4	Use the techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development, participating in lifelong learning, and demonstrating the ability to pursue postgraduate and research studies.
7	Achieve an optimum design a system for components, process, constraints, construct, and protect all types of shell structures.
10	For reinforced concrete structures, select appropriate and sustainable technologies by applying a full range of civil engineering fields such as structural analysis and mechanics, material properties, hydrology and fluid mechanics.

3. Intended Learning Outcomes (LO'S):

Competencies	Learning Outcomes (LO'S)
C2 Develop and conduct appropriate experimentation	al Define, basic characteristics,
and/or simulation, analyze and interpret data, assess, and	properties, concepts, and techniques of
evaluate findings, and use statistical analyses and objective	structural analysis and mechanics,
engineering judgment to draw conclusions.	properties, and strength of materials.
C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d1 Think creatively in solving problems of design.
C12 Achieve an optimum design of Reinforced Concrete	b1 Achieve an optimum design of
and Steel Structures, Foundations and Earth Retaining	Reinforced Concrete structures.
Structures.	

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	forces and stresses affecting the shell structures	8	8	-





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2	analysis of shell structures	10	10	-
3	design of shell structures	10	10	-
Total		28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	qel
forces and stresses affecting the shell structures		X			x			x						X
analysis of shell structures		X			X			x						x
design of shell structures		X			x			х						x

6. Teaching and learning methods for disabled students:

No.	Teaching MethodsReason				
1	Presentation of the course in digital material	Better access any time			
2	Asking small groups to do assignments; each composed of	Knowledge and skills transfer			
Z	low, medium, and high-performance students.	among different level of students.			

7. Student evaluation:

7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid Term Examination	C2 C9	a1 d1
2	Semester work	C9	dl
3	Final Term Examination	C2	al d1
5		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work	2nd, 7th, 9th
2	Mid Term examination	8th
3	Final term examination	15 <i>th</i>





7.3 Weighting of Evaluation:

No.	Evaluation method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Essential books: Design Principles and Analysis of Thin Concrete Shells, Iakov Iskhakov, Yuri · Ribakov 2020 Processing of Slender Concrete Shells – Fabrication, Eisenbach, Philipp · 2018
2	Recommended books: Theory and design of concrete shells by Dr. BBINOY KUMARI CHATTERIEE. Reinforced concrete designer's handbook by CHARL - REYNOLDS

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of knowledge and skills of the course:

No.	Торіс	Aims	Competencies	LO's
1	forces and stresses affecting the shell structures	7	C2	al
2	analysis of shell structures	10	C2 C9	a1 d1
3	design of shell structures	10	C9 C12	d1 b1

Course Coordinator: Dr. Rafeek Wadieh **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Engineering Project Evaluation (CIE520)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Engineering Project Evaluation
Course Code	CIE520
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Terebine Herry	Lectures	Tutorial	Practical
Teaching Hours	2	2	-

2. Course Aims:

No.	Aims
6	Analyze data from the intended tests to manage resources creatively.
8	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.

3. Competencies:

Competencies	Learning Outcomes (LOs)
C3 Apply engineering design processes	a3 Recognizes the various construction defects,
to produce cost-effective solutions that	instability, and quality issues and assesses the
meet specified needs with consideration	environmental impacts of projects.
for global, cultural, social, economic,	b1 Judge engineering decisions considering balanced
environmental, ethical, and other	costs, benefits, safety, quality, reliability, and
aspects as appropriate to the discipline,	environmental impact.
and within the principles and contexts of	c1 Incorporate economic, societal, global, environmental,
sustainable design and development.	and risk management factors into design.
C4 Utilize contemporary technologies,	al Describe quality assurance systems, codes of practice,
codes of practice and standards, quality	standards, health and safety regulations, and
guidelines, health and safety	environmental concerns.
requirements, environmental issues, and	c2 Use fundamental organizational and project
risk management principles.	management abilities.
C13 Plan and manage construction	
processes; address construction defects,	
instability, and quality issues; maintain	(a1) Define the plan and manage the construction process.
safety measures in construction and	(c1) Assess the environmental impacts of projects.
materials; and assess the environmental	
impacts of projects.	



4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Fundamentals of Project Appraisal and Feasibility Study	6	6	-
2	Planning of Civil Engineering Projects	6	6	-
3	Economic Analysis of Civil Engineering Projects	6	6	-
4	Introduction to Environmental and Social Impact Assessment	6	6	-
5	Case Studies on Civil Engineering Project Appraisal	4	4	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Fundamentals of Project Appraisal and Feasibility Study	\checkmark			\checkmark										
2	Planning of Civil Engineering Projects														
3	Economic Analysis of Civil Engineering Projects	\checkmark													
4	IntroductiontoEnvironmental andSocialImpactAssessment		\checkmark								\checkmark				
5	Case Studies on Civil Engineering Project Appraisal														

6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases





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3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C3	a3, b1, c1
1	Semester Works (Quizzes, Sheets, Reports)	C4	a1, c2
		C13	a1, c1
		C3	a3, b1, c1
2	Mid-Term Exam	C4	a1, c2
		C13	a1, c1
3		C3	a3, b1, c1
	Final-Term Exam	C4	a1, c2
		C13	a1, c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	4 th , 11 th
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
	Total	100%

8. List of References:

No.	Reference List		
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and		
1	Development. Chartered Institute of Building (Great Britain).		
2	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,		
2	Scheduling, and Control.		
3	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and		
Architects.			
Project Management Institute and Project Management Institute. A Guide			
⁴ Management Body of Knowledge (PMBOK Guide).			
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,		
3	Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.		
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.		







9. Facilities Required for Teaching and Learning:

Facility						
1	Lecture Classroom	3	White Board			
2	Seminar	4	Data Show System			

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
	Fundamentals of Project Appraisal and		C3	a3, b1, c1
1	Feasibility Study	6, 8	C4	a1, c2
	Teasionity Study		C13	a1, c1
2	Planning of Civil Engineering Projects	6, 8	C13	a1, c1
3	Economic Analysis of Civil Engineering Projects	6, 8	C3	a3, b1, c1
	Introduction to Environmental and Social Import		C3	a3, b1, c1
4	Assessment	6, 8	C4	a1, c2
	Assessment		C13	a1, c1
	Case Studies on Civil Engineering Project		C3	a3, b1, c1
5	Case Studies on Civil Engineering Project	6, 8	C4	a1, c2
	Appraisai		C13	a1, c1

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Environmental Pollution Control (CIE521)

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Responsible for the Course	Civil Engineering Department			
Course Title	Environmental Pollution Control			
Course Code	CIE521			
Year/Level	Level 5			
Specialization	Minor – Elective Course			
Authorization Date of Course Specification	-			
Pre- request	Complete 100 h			

Teaching hours	Lectures	Tutorial	Practical
Teaching hours	2	2	-

2. Course Aims

No.	Aims				
	Use the techniques, skills, and current engineering tools required for wastewater engineering				
4	practice by taking full responsibility for one's own learning and development, participating				
	in lifelong learning, and demonstrating the ability to pursue research studies.				
7	Achieve an optimum design for wastewater treatment plants and sewerage system.				
Plan and manage construction processes for wastewater treatment plants, poll					
10	and assess environmental impacts of projects.				

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex	a3 Explain the basic principles of wastewater
engineering problems by applying	engineering works.
engineering fundamentals, basic science,	b2 Using scientific concepts and theories that are
and mathematics.	relevant to wastewater and pollution control works.
C3 Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for environmental, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	 a2 Understand the professional ethics and impacts of engineering solutions on the environment. a3 Recognize the various construction defects, instability, and quality issues and assess the project's environmental impacts. c1 Incorporate environmental, and pollution control into the design.
C12 Achieve an optimum design of wastewater treatment works for environmental control and protection.	b2 Achieve an optimum design of wastewater treatment plants and sewerage systems.
C13 Plan and manage appropriate processes; address construction defects, instability, and quality issues; maintain safety measures in construction and	c1 Assess the environmental impacts of different types of projects.





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materials;	and a	assess	the	environmental
impacts of	f projec	ets		

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Introduction to the Soil, Water, and Air pollution	2	2	-
2	Sewage sources as a pollution source	2	2	-
3	Sewage characteristics, and detailed planning and design of sewerage system	2	2	
4	Design of pump stations	2	2	-
5	Wastewater treatment plant design (Primary treatment, deceleration tank, screen, approach channel, grit removal chamber, and primary sedimentation tank)	4	4	-
6	Wastewater treatment plant (Biological treatment)	4	4	-
7	Wastewater treatment plant (Tertiary treatment)	4	4	-
8	Sludge treatment, disposal, and reuse	4	4	-
9	Introduction to environmental control and assessment of environmental impact. Case studies	4	4	
	Total	28	28	_

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and	Cooperative	Discovering	Modeling	Tutorial
Introduction to the Soil, Water, and Air pollution	x			x	X			X		Х				x
Sewage sources as a pollution source	x			x	x			x						x
Sewage characteristics, and detailed planning and design of sewerage system	x			x	x			x						x
Design of pump stations	x			x	x			x		x				x
Wastewater treatment plant design (Primary treatment, deceleration tank, screen, approach channel, grit removal chamber, and primary sedimentation tank)	x			x	x			x						x
Wastewater treatment plant (Biological treatment)	x			х	X			X						x
Wastewater treatment plant (Tertiary treatment)				x	x			x		x				x
Sludge treatment, disposal, and reuse				x	х			х						x
Introduction to environmental control and assessment of environmental impact. Case studies	x			x	x			x						x





6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midtom exemination	C1	a3, b2
1		C3	a2, a3, c1
		C1	a3, b2
2	Semester work (quizzes, sheets, reports)	C3	a2, a3, c1
2		C12	b2, c1
		C13	c1
		C1	a3, b2
3	Final term examination	C3	a2, a3, c1
		C12	b2, c1
		C13	c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8 th
2	Semester work	Continuous
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Course notes: Lecture notes prepared by the course coordinator.
	Solved examples.
2	● الكود المصري لأسس تصميم وتنفيذ محطات تنقية مياه الشرب والصرف الصحي ومحطات الرفع – قرار وزاري رقم 169 لسنة 1997-الطبعة الثالثة 2004.
3	Recommended books Wastewater Engineering: Treatment and Reuse (McGraw-Hill Series in Civil and Environmental Engineering)–16 May 2002-by N/A Metcalf & Eddy, Inc., George Tchobanoglous, Franklin Burton, H. David Stensel





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4	1- د /محمد صادق العدوى "هندسة امداد المياه" دار صادق للنشر – كلية الهندسة جامعة القاهرة 2- د /محمد سعيد الخولى "الهندسة الصحية للمبانى " – كلية الهندسة جامعة عين شمس 3- د /محمد على على فرج "الهندسة الصحية" منشأة المعارف بالاسكندرية – كلية الهندسة جامعة الاسكندرية 4- د/ احمد فاضل عشرى "امداد المدن بالمياه – تنقية مياه الشرب – معالجة المخلفات السائلة" – كلية الهندسة – قسم الاشغال العامة – جامعة المنصورة
5	Periodicals, Web sites, etc. www.awwa.org www.epa.gov

9. Facilities required for teaching and learning:

Facility									
1	Lecture classroom	3	White board						
2	Seminar	4	Data show system						

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction to the Soil, Water, and Air pollution	4	C1	a3, b2
2	Sewage sources as a pollution source	4, 7	C1, C3	a2, a3, c1
3	Sewage characteristics, and detailed planning and design of sewerage system	4, 7, 10	C12, C13	b2, c1
4	Design of pump stations	7, 10	C3, C12, C13	a2, a3, c1, b2
5	Wastewater treatment plant design (Primary treatment, deceleration tank, screen, approach channel, grit removal chamber, and primary sedimentation tank)	7, 10	C3, C12, C13	a2, a3, c1, b2
6	Wastewater treatment plant (Biological treatment)	7, 10	C3, C12, C13	a2, a3, c1, b2
7	Wastewater treatment plant (Tertiary treatment)	7, 10	C3, C12, C13	a2, a3, c1, b2
8	Sludge treatment, disposal, and reuse	7, 10	C1, C3, C12, C13	a2, a3, c1, b2
9	Introduction to environmental control and assessment of environmental impact. Case studies	7, 10	C1, C3	a2, a3, c1

Course Coordinator: Assoc. Prof. Dr. Medhat Elzahar **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Fiber Reinforced Cement Composites (CIE522)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Fiber Reinforced Cement Composites
Course Code	CIE522
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre- request	Complete 100 h

Taashing have	Lectures	Tutorial	Practical		
Teaching hours	2	2	-		

2. Course Aims

No.	Aims
	Select appropriate and sustainable technologies for construction of buildings, infrastructures,
8	and water structures, using numerical techniques, experiment measurements, and testing by
	applying a full range of civil engineering fields such as properties and strength of materials
	Select appropriate and sustainable technologies for construction of buildings, infrastructures
10	and water structures, using numerical techniques, experiment measurements, and testing by
	applying a full range of civil engineering fields such as properties and strength of materials

3. Competencies:

Competencies	Learning Outcomes (LO'S)				
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	a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings				
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	 a1 Describe codes of practice, and standards, as well as health and safety regulations. a3 Define contemporary engineering technologies and their applications in relation to disciplines. b1create methodical approaches when dealing with new and advancing technology. 				
C11 Select appropriate and sustainable technologies for construction of buildings,	a1 Recognize the fundamentals of properties and strength of materials,				
infrastructures and water structures, using either	a2 Summarize, appropriate and				
numerical techniques or physical measurements	sustainable technologies for construction of				
and/or testing by applying a full range of civil	buildings,				





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engineering	concepts	and	techniques	of	
properties and strength of materials					

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical	
1	Fiber-reinforcement of cement-based matrices,	4	4		
1	continuous and discontinuous fibers, and meshes.	4	4	-	
2	Fiber-reinforced concrete and Ferro-cement	2	2	-	
3	Laminated cementations composites	2	2	-	
4	Behavior and mechanical properties. Mechanics of	0	0		
4	fiber reinforcement	0	0	-	
5	Constitutive models. High-strength, high-	4	4		
5	performance fiber composites.	4	4	-	
6	Hybrid and smart composites	4	4	-	
7	Lectures, projects and laboratory	4	4	-	
	Total	28	28	-	

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Fiber- reinforcement of cement-based matrices, continuous and discontinuous fibers, and meshes.	\checkmark			\checkmark	\checkmark	\checkmark	\checkmark						\checkmark	
Fiber-reinforced concrete and Ferro- cement	\checkmark				\checkmark	\checkmark	\checkmark						\checkmark	
Laminated cementations composites	\checkmark			\checkmark	\checkmark	\checkmark	\checkmark						\checkmark	
Behavior and mechanical properties.	\checkmark				\checkmark	\checkmark	\checkmark						\checkmark	







Mechanics of fiber reinforcement											
Constitutive models. High- strength, high- performance fiber composites.	\checkmark		\checkmark	\checkmark	\checkmark	\checkmark				\checkmark	
Hybrid and smart composites	\checkmark	\checkmark		\checkmark	\checkmark	\checkmark					
Lectures, projects, and laboratory								x			

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C2	a2
1	Midterm examination	C4	a3
		C11	al
ſ	Somester work (avizzes sheets report)	C4	a1, b 1, a3
2	Semester work (quizzes, sheets, report)	C11	a2
		C4	a1, a3
3	Final term examination	C11	a2
		C2	a 2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8th
2	Semester work	all
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%





8. List of References:

No.	Reference List
1	High performance fiber reinforced cement composite / 2018 / gustavoj.puraa

9. Facilities required for teaching and learning:

	Fac	ility	
1	Lecture classroom	3	White board
2	Seminar	4	Data show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Fiber-reinforcement of cement-based matrices,	8 10	C2	a 2
1	continuous and discontinuous fibers, and meshes.	8,10	C4	a3, a1
			C2	a 2
2	Fiber-reinforced concrete and Ferro-cement	8,10	C4	a1, a2
			C11	a1, a2
			C2	a 2
3	Laminated cementations composites	8,10	C4	a1, a2
			C11	a1, a2
	Pahovier and machanical properties. Machanics of		C2	a 2
4	fiber reinforcement	8,10	C4	a1, a2
	liber reinforcement		C11	a1, a2
	Constitutive models High strength high		C2	a 2
5	constitutive models. High-strength, high-	8,10	C4	a1, a2
	performance fiber composites.		C11	a1, a2
6	Hybrid and smart composites	8,10	C11	a1, a2
7	Lectures, projects, and laboratory	8,10	C11	a1, a2

Course Coordinator: Dr. Nesreen Elawadly **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Ground Water Hydraulics</u> (CIE523)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Ground Water hydraulics
Course Code	CIE523
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre- request	Complete 100 h

Teaching hours	Lectures	Tutorial	Practical	
Teaching hours	2	2	-	

2. Course Aims

No.	Aims
4	Use the techniques, skills, and current engineering tools required for the groundwater hydraulics applications (aquifers systems, wells constructions operation and maintenance)
7	Achieve an optimum solution of groundwater problems and design abstraction groundwater wells.
10	Select appropriate and sustainable technologies for construction of groundwater wells, drilling and testing, saltwater intrusion mitigation.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and	a2 Define the principles, basic properties, and features of
solve complex engineering	groundwater and the types of aquifers, saltwater intrusion.
problems by applying	b1 Estimating mechanics of flow through porous media.
engineering fundamentals,	b2 Using scientific concepts and theories that are relevant to
basic science, and	groundwater such as Darcy's law – application – direct of ground
mathematics.	water flow
C12 Achieve an optimum	
design of groundwater	b1 Achieve an optimum planning and design of seepage problem
abstraction wells, seepage	through dams and saltwater intrusion.
problem through dams, and	b2 Achieve an optimum planning and design of groundwater
saltwater intrusion	abstraction wells and drilling and testing of wells.
assessment.	

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Introduction – groundwater- types of aquifers	2	2	-
2	Mechanics of flow through porous media	4	4	-





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3	Darcy's law – application – direct of ground water flow	4	4	-
4	Case studies (Seepage through dam – seepage through confined aquifer – seepage under a dike)	2	2	-
5	Steady and unsteady flow to wells – fully and partially penetrating of wells	4	4	-
6	Saltwater intrusion (potential flow theory – boundary effects – theory of images – numerical methods – analytical methods)	8	8	-
7	Practical aspects of well design	2	2	-
8	Drilling and testing	2	2	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	qel
Introduction – groundwater- types of aquifers	X	X			x	x	X							
Mechanics of flow through porous media	X	X			x	x	X							
Darcy's law – application – direct of ground water flow	X	X			X	X	X							
Case studies (Seepage through dam – seepage through confined aquifer – seepage under a dike)	X	X			х	X	X							
Steady and unsteady flow to wells – fully and	x	x			x	x	x							







partially penetrating of wells										
Saltwater intrusion (potential flow theory – boundary effects – theory of images – numerical methods – analytical methods)	x	x		x	X	x				
Practical aspects of well design	X	x		X	X	X				
Drilling and testing	х	x		x	х	х				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid torm exemination	C1	a2, b1, b2
	wiid-term examination	C12	b1,
2 Se	Som oston world	C1	a2, b1, b2
	Semester work	C12	b1, b2
4	Final tarm avamination	C1	a2, b1, b2
4	Final term examination	C12	b1, b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	2 nd ,7 th , 9 th
2	Mid Term examination	8 th
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%





8. List of References:

No.	Reference List				
	El-Ghandour, H.A., (2020). "Analysis and Optimization of Saltwater Intrusion in Coastal				
1	Aquifers". M.Sc. Thesis, Irrigation and Hydraulics Dept., Faculty of Engineering, El-				
	Mansoura University, P. 177.				
2	Todd, D.K., Mays, L.W., (2020). "Groundwater Hydrology". Willy India				
John H. Cushman, Daniel M. Tartakovsky. (2018) The Handbook of Gro					
3	Engineering. Available on Taylor & Francis eBooks				
	El-Ghandour, H.A., (2018). "Analysis and Optimization of Saltwater Intrusion in Coastal				
4	Aquifers". M.Sc. Thesis, Irrigation and Hydraulics Dept., Faculty of Engineering, El-				
	Mansoura University, P. 177.				

9. Facilities required for teaching and learning:

		•	
1	Lecture classroom	3	White board
2	Seminar	4	Data show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction – groundwater- types of aquifers	4, 10	C1	a2
2	Mechanics of flow through porous media	7	C1	a2, b1
3	Darcy's law – application – direct of ground water flow	7	C1	b2
4	Case studies (Seepage through dam – seepage through confined aquifer – seepage under a dike)		C12	b1
5	Steady and unsteady flow to wells – fully and partially penetrating of wells		C12	b2
6	Saltwater intrusion (potential flow theory – boundary effects – theory of images – numerical methods – analytical methods)		C1 C12	a2, b1
7	Practical aspects of well design		C12	b2
8	Drilling and testing	7, 10	C12	b2

Course Coordinator: Assoc. Prof. Mohammed Gabr **Head of Department:** Prof. Mohammed Elkiki **Date of Approval:** 2022. 



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Highway Materials and Construction (CIE524)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Highway Materials and Construction
Course Code	CIE524
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre- request	Complete 100 h

Taaahing haung	Lectures	Tutorial	Practical		
reaching nours	2	2	-		

2. Course Aims

No.	Aims
4	Master a broad range of engineering knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.
7	Achieve an optimum design of civil engineering works such as: flexible pavement and rigid pavement
10	Select appropriate and sustainable technologies for construction of highways infrastructures experiment measurements and testing by applying a full range of civil engineering fields such as structural analysis and mechanics, properties, and strength of materials.

3. Competencies:

Competencies	Learning Outcomes (LO'S)	
C1 Identify, formulate, and solve	a3 Explain the basic principles of engineering for road	
complex engineering problems by	materials included hot mix asphalt (flexible pavement) and	
applying engineering fundamentals,	concrete mixture (rigid pavement).	
basic science, and mathematics.	b2 Using scientific concepts and theories that are relevant to	
	road materials to select the appropriate thickness of road layers	
C11 Select appropriate and	a2 Summarize, appropriate and sustainable technologies for	
sustainable technologies for	roads construction and rehabilitation, bituminous materials,	
construction road works and	and concrete mixtures.	
rehabilitation of roads.		
C12 Achieve an entimum design of	b2 Achieve an optimum design of flexible pavement and rigid	
C12 Achieve an optimum design of	pavement based on the appropriate selection of materials and	
pavement layers.	their strengths	





4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Application of soil classification methods, material characterization, sub-grade and sub-base stabilization, material variability and quality control	12	12	-
2 pavement evaluation and rehabilitation, highway construction		16	16	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Application of soil classification methods, material characterization, sub-grade and sub- base stabilization, material variability and quality control	X	X			X	X	X							
pavement evaluation and rehabilitation, highway construction	X	X			X	X	X							

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason			
1	Presentation of the course in digital material	Better access any time			
2	Asking small groups to do assignments; each composed	Knowledge and skills transfer			
2	of low, medium, and high-performance students.	among different level of students.			

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid torm exemination	C1	a3, b2
	Wid-term examination	C11	a2





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2	Somostor work	C11	a2
	Semester work	C12	b2
3	Final term examination	C1	a3, b2
		C11	a2
		C12	b2

7.2 Evaluation Schedule:

No.	Evaluation Method Weeks					
1	Semester work	2nd,7th, 9th				
2	Mid Term examination	8th				
3	Final term examination 15th					

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
	Essential books (textbooks / design codes):
1	Egyptian Code for Design and Construction of Reinforced Concrete Structures 203-2018.
1	Design Aids and Examples in Accordance with the Egyptian Code for Design and
	Construction of Reinforced Concrete Structures 203-2018.
2	Advanced structural materials, 2020

9. Facilities required for teaching and learning:

	Facility						
1	Lecture classroom	3	White board				
2	Seminar	4	Data show system				

10. Matrix of knowledge and skills of the course:

No.	Торіс	Aims	Competencies	LO's
1	Application of soil classification methods, material characterization, sub-grade and sub-base stabilization, material variability and quality control	1,7	C1 C11	a3, b2 a2
2	pavement evaluation and rehabilitation, highway construction	1,7	C1 C11 C12	a3, b2 a2 b2

Course Coordinator: Assoc. Prof. Dr. Alaa Gabr **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Modern Structure Materials</u> (CIE525)

1. Basic Information:

Program Title	Civil Engineering Program		
Department Offering the Program	Civil Engineering Department		
Department Responsible for the Course	Civil Engineering Department		
Course Title	Modern Structure Materials		
Course Code	CIE525		
Year/Level	Level 5		
Specialization	Minor – Elective Course		
Authorization Date of Course Specification	-		
Pre-request	Complete 100 h		

Taaahing haung	Lectures	Tutorial	Practical		
reaching nours	2	2	-		

2. Course Aims

No.	Aims
	Select appropriate and sustainable technologies for construction of buildings, infrastructures,
8	and water structures, using numerical techniques, experiment measurements, and testing by
	applying a full range of civil engineering fields such as properties and strength of materials
	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and
10	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.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
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	 a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings. c2 Develop suitable experimentation and/or simulation.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	 a1 Describe codes of practice, and standards, as well as health and safety regulations. a3 Define contemporary engineering technologies and their applications in relation to disciplines. b1Create methodical approaches when dealing with new and advancing technology
C11 Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures, using either numerical techniques or physical measurements and/or testing by	a1 Recognize the fundamentals of properties and strength of materials,a2 Summarize, appropriate and





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applying a full range of civil engineering concepts	sustainable technologies for construction of
and techniques of properties and strength of	buildings.
materials	

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	General introduction for the technological development of material science	8	8	-
2	general classification of the modern materials in the structure field – compound materials and their applications	10	10	-
3	carbon fibers and its use in structures – insulating materials – ant fire materials	10	10	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
General introduction for the technological development of material science	\checkmark	\checkmark			\checkmark	\checkmark	\checkmark							
general classification of the modern materials in the structure field – compound materials and their applications	\checkmark	\checkmark			\checkmark	\checkmark	\checkmark							
carbon fibers and its use in structures – insulating materials – ant fire materials	\checkmark	\checkmark			\checkmark	\checkmark	\checkmark							





6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C2	a2, c2
1	Midterm examination	C4	a1, a3
		C11	a1, a 2
2	Semester work (quizzes, sheets, report)	C2	a2, c2
		C4	a1, a 3
		C11	a1, a2
		C2	a2, c2
3	Final term examination	C4	a1, a3
		C11	a1, a2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8th
2	Semester work	all
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	100%	

8. List of References:

No.	Reference List
	Essential books (textbooks / design codes):
1	Egyptian Code for Design and Construction of Reinforced Concrete Structures 203-2018.
	Design Aids and Examples in Accordance with the Egyptian Code for Design and
	Construction of Reinforced Concrete Structures 203-2018.
2	Advanced structural materials, 2010

9. Facilities required for teaching and learning:

Facility							
1	Lecture classroom	3	White board				
2	Seminar	4	Data show system				





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10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	General introduction for the technological development material science	8,10	C4	a3, a1
2	general classification of the modern materials in the structure field – compound materials and their applications	8,10	C4 C11	a3 a1, a2
3	carbon fibers and its use in structures – insulating materials – ant fire materials	8,10	C11	a1, a2

Course Coordinator: Dr. Nesreen Elawadly **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Hydraulics Engineering</u> (CIE526)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Hydraulic Engineering
Course Code	CIE526
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre-request	Complete 100 h

Teeshing hours	Lectures	Tutorial	Practical	
reaching nours	2	3	-	

2. Course Aims:

No.	Aims
	Master a broad range of engineering knowledge and specialized skills by applying theories
1	and thinking to identify and solve engineering problems regarding to the applications of
	hydraulic engineering.
7	Achieve an optimum design for steady flow in pipelines (Basics), hydraulic analysis of
	pipeline networks, and unsteady flow in pipeline networks.
10	Select appropriate and sustainable technologies for the pipeline networks.

3. Competencies:

Competencies	Learning outcomes (LO'S)
C1 Identify, formulate, and solve complex design of hydraulics engineering by applying engineering fundamentals, basic science, and mathematics. C11 Select appropriate and sustainable technologies for	 a1 Describe the relevant mathematical principles and theories in the discipline concepts regarding the flow through orifices (types – time of filling and emptying tanks), and the flow over weirs. a2 Explain the principal types of the governing flow equations (Bernoulli and Continuity) theories; and the momentum equation and its applications fields. a2 Summarize, appropriate and sustainable technologies for the subscription.
construction of the pipeline networks	pipeline networks constructions.
C12 Achieve an optimum design of marine structures and Harbors.	b1 Achieve an optimum design of orifices and the pipeline networks.b2 Achieve an optimum design of the orifices and wires

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Governing equations (Bernoulli and Continuity) – Applications	4	4	-





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2	Flow through orifices (types – equations – time of filling and emptying tanks)	4	4	-
3	Flow over weirs (types – equations)	4	4	-
4	Application of Momentum equation	2	2	-
5	Steady flow in pipelines (Basics) – Hydraulic analysis of pipe line networks	10	10	-
6	Unsteady flow in pipeline networks	4	4	-
	Total	28	28	-

5. Teaching and Learning Methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Governing equations (Bernoulli and Continuity) – Applications	X	X			X	X	X							
Flow through orifices (types – equations – time of filling and emptying tanks)	X	X			X	X	X							
Flow over weirs (types – equations)	x	х			x	х	x							
Application of Momentum equation	X	X			X	х	х							
Steady flow in pipelines (Basics) – Hydraulic analysis of pipeline networks	X	X			X	X	X							
Unsteady flow in pipeline networks	x	x			x	х	x							



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6. Teaching and Learning Methods of disabled Students:

No.	Teaching Method
1	Additional Tutorials
2	Online lectures and assignments

7. Student assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	Competencies	LOs
		C1	a1, a2
1	Mid Term Examination (written)	C11	a2
		C12	b1, b2
2		C1	a1, a2
	Formative (quizzes- online quizzes- presentation)	C11	a2
		C12	b1, b2
		C1	a1, a2
3	Final Term Examination (written)	C11	a2
		C12	b1, b2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks		
1	Mid Term Examination (written/ online)	8th		
2	Practical/ Oral Examination	15th		
3	Formative (quizzes- online quizzes presentation- Tutorial and report assessment)	Every week		
4	Final Term Examination (written)	Decided by Faculty Council		

7.3 Weighting of Assessments:

No.	Assessment Method	Weights		
1	Mid Term Examination (written/ online)	20%		
2	Formative (quizzes- online quizzes presentation-Tutorial and report assessment)	20%		
3	Final Term Examination (written)	60%		
Total		100%		

8. List of References:

No.	Reference List			
1	Fluid mechanics through problems R.J GARDE, New AGE publishers- 2018			
2	Flow in open channels K. Subramanya. Tata Mcgraw hill education private limited, NE DELHI 2020			

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	Lab Facilities
3	White Board
4	Data Show System
5	Presenter





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10. Matrix of Knowledge and Skills of the Course

No.	Торіс	Aims	Competenci es	LO's
1	Governing equations (Bernoulli and Continuity) - Applications	1	C1	a2
2	Flow through orifices (types – equations – time of filling and emptying tanks)	7	C1 C12	al b1
3	Flow over weirs (types – equations)	7	C1 C12	a1 b2
4	Application of Momentum equation	1	C1	a2
5	Steady flow in pipelines (Basics) – Hydraulic analysis of pipeline networks	7, 10	C11 C12	a2 b1
6	Unsteady flow in pipeline networks	7, 10	C11 C12	a2 b1

Course Coordinator Assoc. Prof. Dr. Mohammed Gabr **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022






Pavement Design (CIE527)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Pavement Design
Course Code	CIE527
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre- request	Complete 100 h

Tasahing baung	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims
	Use the techniques, skills, and current engineering tools required for design practice by taking
4	and demonstrating the ability to pursue postgraduate and research studies.
7	Achieve an optimum design of pavement.
10	Select appropriate and sustainable technologies for construction of pavement using numerical techniques.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	a2 Summarize, appropriate of Pavement materials and sustainable technologies for construction of highways
C6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	 b1 interpret data derived from laboratory observation from equipment flow sheets, charts, and curves to interpret data derived from laboratory observation. c2 Acquire entrepreneurial skills.
C11 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	 a1 Recognize the fundamentals of structural analysis and mechanics, properties and strength of pavement materials, stress analysis. a2 Summarize, appropriate and sustainable technologies for construction of highways, infrastructures.





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of	materials,	surveying,	soil	mechanics,	
hydrology, and fluid mechanics.					

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Characteristics of pavement loads.	4	4	-
2	Stress analysis in pavements.	4	4	-
3	Design practices, construction, rehabilitation, and maintenance.	4	4	-
4	Optimization of the design of rigid and flexible pavements systems.	4	4	-
5	Empirical and mechanistic stochastic structural subsystems.	4	4	-
6	Utility theory, serviceability concept, cost studies, traffic delay, environmental deterioration, rehabilitation, and maintenance optimization systems.	8	8	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	qel
Characteristics of pavement loads.	х	x			x	x	x							
Stress analysis in pavements.	x	X			x	x	X							
Design practices, construction, rehabilitation, and maintenance.	x	X			x	x	X							
Optimization of the design of rigid and flexible pavements systems.	x	x			x	x	x							
Empirical and mechanistic	x	X			x	x	X							







stochastic structural subsystems.										
Utility theory, serviceability concept, cost studies, traffic delay, environmental deterioration, rehabilitation, and maintenance optimization systems.	x	x		x	x	x				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material.	Better access any time.
2	Asking small groups to do assignments each composed	Knowledge and skills transfer
Z	of low, medium, and high-performance students.	among different levels of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C4	a2
1	Mid-term examination	C6	b1, c2
		C11	a1, a2
		C4	a2
2	Semester work	C6	b1, c2
		C11	a1, a2
		C4	a2
3	Practical Examination	C6	b1, c2
		C11	a1, a2
		C4	a2
4	Final term examination	C6	b1, c2
		C11	a1. a2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work	2nd,7th, 9th
2	Mid Term examination	8 <i>th</i>
3	Practical Examination	14 <i>th</i>
4	Final term examination	15 <i>th</i>

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	10%
2	Semester work	20%





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3	Practical Examination	10%			
4	Final-term examination	60%			
	Total	100%			

8. List of References:

No.	Reference List
1	Khurmi, R.S. (2018). " A textbook of hydraulics, fluid mechanics and hydraulic machines" S.
1	Chanel and company Ltd. P.990
2	Subramanya, K. (2018) "Flow in open channels" McGra- Hill Education (India). P.602
2	Glenn E. Moglen. 2020.Fundamentals of Open Channel Flow. CRC Press. Available on Taylor
3	& Francis eBooks.

9. Facilities required for teaching and learning:

Facility										
1	Lecture classroom	3	White board							
2	Seminar	4	Data show system							
5	Lab.									

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
			C4	a2
1	Characteristics of pavement loads	7	C6	b1, c2
			C11	a1, a2
			C4	a2
2	Stress analysis in pavements	7	C6	b1, c2
			C11	a1, a2
	Design prostigge construction		C4	a2
3	rehabilitation and maintenance	7	C6	b1, c2
	Tenaointation, and maintenance		C11	a1, a2
	Optimization of the design of rigid and		C4	a2
4	flowible never on the design of rigid and	7	C6	b1, c2
	nexible pavements systems		C11	a1, a2
	Empirical and machanistic stachastic		C4	a2
5	structural subsystems	7	C6	b1, c2
	structural subsystems		C11	a1, a2
	Utility theory, serviceability concept, cost			
	studies, traffic delay, environmental		C4	a2
6	deterioration,	7	C6	b1, c2
	rehabilitation and maintenance optimization		C11	a1, a2
	systems.			

Course Coordinator: Assoc. Prof. Dr. Alaa Gabr **Head of Department:** Prof. Mohamed Elkiki **Date of Approval:** 2022





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Planning of Buildings Maintenance and Protection (CIE529)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Planning of buildings maintenance and Protection
Course Code	CIE529
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre-request	Complete 100 h

Teaching hours	Lectures	Tutorial	Practical		
Teaching nours	2	2	-		

2. Course Aims

No.	Aims
	Use the techniques, skills, and current engineering tools required for engineering practice by
4	taking full responsibility for one's own learning and development, participating in lifelong
	learning, and demonstrating the ability to pursue postgraduate and research studies.
	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and
7	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.
	Select appropriate and sustainable technologies for construction of buildings, infrastructures,
	and water structures; using numerical techniques, experiment measurements, and testing by
10	applying a full range of civil engineering fields such as structural analysis and mechanics,
	properties and strength of materials, surveying, soil mechanics, hydrology and fluid
	mechanics.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
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.	b4 Evaluate components, systems, and processes are evaluated for their characteristics and performance.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	c1 Apply safe systems at work by taking the necessary precautions to manage hazards.
C13 Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and	 b1 Address construction defects, instability, and quality issues c1 Assess environmental impacts of projects.





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materials;	and	assess	environmental	impacts	of
projects.					

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Review on of deterioration of building materials	4	4	-
2	Concept of life cycle cost- Protection methods against deterioration and corrosion of building materials	8	8	-
3	Types of defects and damages. Non-destructive tests	6	6	-
4	Partially destructive tests. Load tests. Materials for repair and selection. Methods and techniques of repair. Rehabilitation and retrofitting.	10	10	-
	Total	28	28	_

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Review on of deterioration of building materials	X	X			X	X	X							
Concept of life cycle cost- Protection methods against deterioration and corrosion of building materials	x	X			x	x	x							
Types of defects and damages. Non- destructive tests	x	x			x	x	x							
Partially destructive tests. Load tests. Materials for repair and selection.	X	Х			X	X	X							





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Methods techniques	and of							
repair. Rehabilitation retrofitting.	and							

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high- performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C13	b1, c1
2	Semester work (quizzes, sheets, report)	C13	b1, c1
3	Final term examination	C3, C13	a1, b1, c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	$7^{\text{th}}, 9^{\text{th}}$
2	Mid Term examination	8 th
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Using and understanding engineering service and constructing john Clark 2018

9. Facilities required for teaching and learning:

Facility				
1	Lecture classroom	3	White board	
2	Seminar	4	Data show system	





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10.	Matrix of knowledge and skills of the course:			
No	Торіс	Aims	Competencies	LO's
1	Review on of deterioration of building materials	4	C13	a1, c1
2	Concept of life cycle cost- Protection methods against deterioration and corrosion of building materials	3	C3, C13	b1, c1
3	Types of defects and damages. Non-destructive tests	4	C13	a1, c1
4	Partially destructive tests. Load tests. Materials for repair and selection. Methods and techniques of repair. Rehabilitation and retrofitting.	3	C3, C13	b1, c1

Course Coordinator: Dr. Ayman Helal **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Prefabricated Concrete Frames (CIE530)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Prefabricated Concrete Frames
Course Code	CIE530
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre-request	Complete 100 h

Tasahing hours	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims
	Use the techniques, skills, and current engineering tools required for engineering practice by
4	taking full responsibility for one's own learning and development, participating in lifelong
	learning, and demonstrating the ability to pursue postgraduate and research studies.
	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and
7	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.
	Select appropriate and sustainable technologies for construction of buildings; using numerical
10	techniques, experiment measurements, and testing by applying a full range of civil
	engineering fields such as structural analysis and mechanics, properties, and strength of
	materials.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C2 Develop and conduct appropriate experimentation	a2 Define the principles, basic properties,
and/or simulation, analyze and interpret data, assess	and features of construction material, as
and evaluate findings, and use statistical analyses and	well as their use in sustainable technologies
objective engineering judgment to draw conclusions	for construction of buildings
	al Describe codes of practice, and
C4 Utilize contemporary technologies, codes of	standards, as well as health and safety
practice and standards, quality guidelines, health and	regulations.
safety requirements, environmental issues, and risk	a3 Define contemporary engineering
management principles	technologies and their applications in
	relation to disciplines.
C11 Select appropriate and sustainable technologies	al Recognize the fundamentals of
for construction of buildings, infrastructures and	properties and strength of materials.







water structures; using either numerical techniques or	a2 Summarize, appropriate and
physical measurements and/or testing by applying a	sustainable technologies for construction of
full range of civil engineering concepts and	buildings.
techniques of: properties and strength of materials	

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Performance of prefabricated concrete	4	4	-
2	Design of concrete supported to shear stress	4	4	-
3	Design of columns	4	4	-
4	Design of roofs	4	4	-
5	Design of building frames	4	4	-
6	Design projects using the computer	4	4	-
7	Detailed reports	4	4	_
	Total	28	28	_

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Performance of prefabricated concrete		X			x	X	x	x						x
Design of concrete supported to shear stress		X			x	X	x	x						x
Design of columns		х			х	х	х	х						х
Design of roofs		х			x	х	x	x						х
Design of building frames		X			x	х	x	х						х
Design projects using the computer		X			x	X	x	х						х
Detailed reports		х			x	х	x	х						x





6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C2	a2
1	Midterm examination	C4	a3
		C11	al
2	Someoten wert (quizzes sheets rement)	C4	al
2	Semester work (quizzes, sheets, report)	C11 a2	a2
2	Einel terms exemination	C4	a1, a3
3	Final term examination	C11	a2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8th
2	Semester work	7th - 9th
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. List of References:

No.	Reference List
	Essential books (textbooks / design codes):
1	Egyptian Code for Design and Construction of Reinforced Concrete Structures 2032018.
1	Design Aids and Examples in Accordance with the Egyptian Code for Design and
	Construction of Reinforced Concrete Structures 203-2018.
	Recommended books:
2	MacGregor J., "Reinforced Concrete: Mechanics and Design," Printice Hall, New Jersey,
	2018.

9. Facilities required for teaching and learning:

	Fac	ility	
1	Lecture classroom	3	White board
2	Seminar	4	Data show system



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10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Performance of prefabricated concrete	4,7,10	C4	a3, a1
2	Design of concrete supported to shear stress	4,7,10	C4 C11	a3 a1, a2
3	Design of columns	4,7,10	C11	a1, a2
4	Design of roofs	4,7,10	C4 C11	a3 a1, a2
5	Design of building frames	4,7,10	C4 C11	a3 a1, a2
6	Design projects using the computer	4,7,10	C11	a1, a2
7	Detailed reports	4,7,10	C11	a1, a2

Course Coordinator: Dr. Nesreen Elawadly **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Project Decision Analysis (CIE531)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Project Decision Analysis
Course Code	CIE531
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Taashing Usung	Lectures	Tutorial	Practical
Teaching Hours	2	2	-

2. Course Aims:

No.	Aims
1	Master a broad range of engineering knowledge and specialized skills, as well as the ability to apply acquired knowledge in real-world situations by applying theories and abstract thinking in analytic critical and systemic thinking to identify, diagnose, and solve engineering problems of varying complexity and variation.
3	Recognize his role in promoting engineering and contributing to the profession's and community's development; by appreciating the physical and natural environment's importance and working to promote sustainability concepts.

3. Competencies:

Competencies	Learning Outcomes (LOs)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 c1 Identify, formulate, and solve complex engineering problems by applying the concepts and the theories of mathematics. c2 Identify, formulate, and solve complex engineering problems by applying the concepts and the theories of sciences, appropriate to the discipline. c3 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals.
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 conclude.	 b3 Analyze and interpret data. b4 Evaluate components, systems, and processes are evaluated for their characteristics and performance. c1 Choose relevant mathematical and computer-based problem modeling and analysis methodologies. c3 Applying statistical analyses and objective engineering judgment to conclude.
C3 Apply engineering design processes to produce cost-effective solutions that	a2 Understand engineering solutions' professional ethics and impacts on society and the environment.





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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	b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
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.	 a2 List the engineering-related business and management principles. c2 Use fundamental organizational and project management abilities.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Quantitative Methods of Decision-Making	6	6	-
2	Important Mathematical Models Useful in Decision Processes	6	6	-
3	Model-Structure Assumptions, Limitations, and Methods for Use	8	8	-
4	Concepts and Models of Support Systems for Management Decision Problems	8	8	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Quantitative Methods of Decision-Making														
2	Important Mathematical Models Useful in Decision Processes		\checkmark			\checkmark									
3	Model-Structure Assumptions, Limitations, and Methods for Use	\checkmark												\checkmark	





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4	ConceptsandModels of SupportSystemsforManagementDecision Problems	\checkmark												\checkmark	
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6. Teaching and Learning Methods for Disabled Students:

	8 8	
No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases
3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C1	c1, c2, c3
1	Somester Works (Quizzes Sheets Deports)	C2	b3, b4, c1, c3
1	Semester works (Quizzes, Sheets, Reports)	C3	a2, b1
		C4	a2, c2
2	Mid-Term Exam	C1	c1, c2, c3
		C1	c1, c2, c3
3	Einel Tom Even	C2	b3, b4, c1, c3
	rinai-i erin Exam	C3	a2, b1
		C4	a2. c2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	$4^{\rm th}, 11^{\rm th}$
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
	Total	100%

8. List of References:

No.	Reference List							
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and Development. Chartered Institute of Building (Great Britain).							
2	Kerzner, Harold. Project Management Workbook. A System Approach to Planning, Scheduling, and Control.							





3	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and Architects.			
4	Project Management Institute and Project Management Institute. A Guide to the Project Management Body of Knowledge (PMBOK Guide).			
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering, Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.			
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.			

9. Facilities Required for Teaching and Learning:

	Facility							
1	Lecture Classroom	3	White Board					
2	Seminar	4	Data Show System					

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
1	Quantitative Methods of Decision- Making	1, 3	C1	c1, c2, c3
2	Important Mathematical Models Useful in Decision Processes	1, 3	C1	c1, c2, c3
3	Model-Structure Assumptions, Limitations, and Methods for Use	1, 3	C2 C3 C4	b3, b4, c1, c3 a2, b1 a2, c2
4	Concepts and Models of Support Systems for Management Decision Problems	1, 3	C2 C3 C4	b3, b4, c1, c3 a2, b1 a2, c2

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Project Financial Management (CIE532)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Project Financial Management
Course Code	CIE532
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Taaabing Houng	Lectures	Tutorial	Practical
Teaching Hours	2	2	-

2. Course Aims:

No.	Aims
6	Analyze data from the intended tests to manage resources creatively.
8	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.

3. Competencies:

Competencies	Learning Outcomes (LOs)
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.	 b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. c1 Incorporate economic, societal, global, environmental, and risk management factors into design.
C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d2 Effectively manage tasks, time, and resources.
C13 Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.	a1 Define the plan and manage the construction process.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Cash Flow and Its Analysis	4	4	-
2	Project Budget and Financial Methods	6	6	-





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3	Risk and Cost Control	4	4	-
4	Financial Path for Project	4	2	-
5	Time Value	4	2	-
6	Profit Rate and Inflation Effects	6	6	-
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Cash Flow and Its Analysis				\checkmark										
2	Project Budget and Financial Methods					\checkmark									
3	Risk and Cost Control														
4	Financial Path for Project														
5	Time Value														
6	Profit Rate and Inflation Effects														

6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases
3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C3	b1, c1
1	Semester Works (Quizzes, Sheets, Reports)	C9	d2
		C13	al
2	Mid Torm Exam	C3	b1, c1
2		С9	d2







		C13	al
		C3	b1, c1
3	Final-Term Exam	C9	d2
		C13	al

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks					
1	Semester Works (Quizzes, Sheets, Reports)	$4^{\text{th}}, 11^{\text{th}}$					
2	Mid-Term Exam	8 th					
3 Final-Term Exam 15 th							
73W	7 3 Weighting of Fyslustion:						

1.0 11	eigning of Evaluation.	
No.	Evaluation Method	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
	Total	100%

8. List of References:

No.	Reference List
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and
1	Development. Chartered Institute of Building (Great Britain).
ſ	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,
2	Scheduling, and Control.
2	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and
3	Architects.
4	Project Management Institute and Project Management Institute. A Guide to the Project
4	Management Body of Knowledge (PMBOK Guide).
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,
3	Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.

9. Facilities Required for Teaching and Learning:

	Facility							
1	Lecture Classroom	3	White Board					
2	Seminar	4	Data Show System					

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	s LOs				
1	Cash Flow and Its Analysis	6, 8	C3 C9 C13	b1, c1 d2 a1				
2	Project Budget and Financial Methods	6, 8	C3	b1, c1				
3	Risk and Cost Control	6, 8	C3	b1, c1				
4	Financial Path for Project	6, 8	C3 C9 C13	b1, c1 d2 a1				





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5	Time Value	6, 8	C3 C9 C13	b1, c1 d2 a1
6	Profit Rate and Inflation Effects	6, 8	C3 C9 C13	b1, c1 d2 a1

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Project Management (2) (CIE533)

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Responsible for the Course	Civil Engineering Department				
Course Title	Project Management (2)				
Course Code	CIE533				
Year/Level	Level 5				
Specialization	Minor – Elective Course				
Authorization Date of Course Specification	-				
Prerequisite	Complete 100 CH				

Taaabing Houng	Lectures	Tutorial	Practical
Teaching Hours	2	2	-

2. Course Aims:

No.	Aims
	Work in and manage a diverse team of professionals from various engineering disciplines,
2	taking responsibility for own and team performance, behaving professionally, and adhering
	to engineering ethics and standards.
	Communicate effectively with various audiences using various forms, methods, and
5	languages; cope with academic and professional issues critically and creatively; and display
	leadership, business administration, and entrepreneurial abilities.
6	Analyze data from the intended tests to manage resources creatively.
	Plan and manage construction processes; address construction defects, instability, and quality
8	issues; maintain safety measures in construction and materials; and assess the environmental
	impacts of projects.
9	Deal with biddings, contracts, and financial issues including project insurance and guarantees.

3. Competencies:

Competencies	Learning Outcomes (LOs)							
	b1 Judge engineering decisions considering							
C3 Apply engineering design processes to	balanced costs, benefits, safety, quality, reliability,							
produce cost-effective solutions that meet	and environmental impact.							
specified needs with consideration for global,	c1 Incorporate economic, societal, global,							
cultural, social, economic, environmental,	environmental, and risk management factors into							
ethical, and other aspects as appropriate to the	design.							
discipline, and within the principles and	c2 Applying engineering design procedures to							
contexts of sustainable design and	generate cost-effective solutions while adhering to							
development.	sustainable design and development principles and							
	contexts.							
C7 Function efficiently as an individual and	d1 Collaborate effectively within a							
as a member of multi-disciplinary and	multidisciplinary team							
multicultural teams.								





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	d2 Work in stressful environments and within
	d3 Motivate individuals.
C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d2 Effectively manage tasks, time, and resources.
C13 Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.	a1 Define the plan and manage the construction process.
C14 Deal with biddings, contracts, and financial issues including project insurance and guarantees.	 a1 Define biddings, contracts, and financial issues. b1 Address biddings, contracts, and financial issues including project insurance and guarantees. c1 Apply biddings, contracts, and financial issues on civil engineering projects.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Evaluation and Performance Development for Construction Projects	2	2	-
2	Productivity in Construction Works	8	8	-
3	The Efficient Utilization of Project Resources	4	4	-
4	Construction Economies	8	8	-
5	Tender's Strategies	4	4	-
6 Different Field Application		2	2	_
	Total	28	28	-

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Evaluation and Performance Development for Construction Projects		\checkmark												
2	Productivity in Construction Works	\checkmark					\checkmark								





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3	The Efficient Utilization of Project Resources		\checkmark					
4	Construction Economies							
5	Tender's Strategies							
6	Different Field	2			2			
U	Application	N			N			

6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason
1	Presentation of The Course in Digital Material	Better Access at Any Time
2	Wed Communication with Students	Better Communication with Certain Cases
3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students
4	An Electronic Model System for The Institution	E. Learning

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
		C3	b1, c1, c2
	Semester Works (Quizzes, Sheets, Reports)	C7	d1, d2, d3
1		C9	d2
		C13	al
		C14	a1, b1, c1
		C7	d1, d2, d3
2	Mid-Term Exam	C9	d2
		C13	a1
		C3	b1, c1, c2
3	Final-Term Exam	C7	d1, d2, d3
		C9	d2
		C13	a1
		C14	a1, b1, c1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	4 th , 11 th
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights		
1	Semester Works (Quizzes, Sheets, Reports)	20%		
2	Mid-Term Exam	20%		
3	Final-Term Exam	60%		
	Total 100%			

8. List of References:

No. Reference List





1	Wiley-Blackwell. Code of Practice for Project Management for Construction and Development. Chartered Institute of Building (Great Britain).
2	Kerzner, Harold. Project Management Workbook. A System Approach to Planning, Scheduling, and Control.
3	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and Architects.
4	Project Management Institute and Project Management Institute. A Guide to the Project Management Body of Knowledge (PMBOK Guide).
5	Lester, Albert. Project Management, Planning, and Control. Managing Engineering, Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.

9. Facilities Required for Teaching and Learning:

Facility				
1	Lecture Classroom	3	White Board	
2	Seminar	4	Data Show System	

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
1	EvaluationandPerformanceDevelopmentforConstructionProjects	6, 8	C9 C13	d2 a1
2	Productivity in Construction Works	2, 5, 6, 8	C7 C9 C13	d1, d2, d3 d2 a1
3	The Efficient Utilization of Project Resources	6, 8	C9 C13	d2 a1
4	Construction Economies	6, 8	C3	b1, c1, c2
5	Tender's Strategies	9	C14	a1, b1, c1
6	Different Field Application	2, 5, 6, 8	C3 C7 C9 C13	b1, c1, c2 d1, d2, d3 d2 a1

Course Coordinator: Dr. Hamdy Abd Elaty **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





<u>Project Visibility Study</u> (CIE534)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Project Visibility Study
Course Code	CIE534
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Prerequisite	Complete 100 CH

Teaching Houng	Lectures	Tutorial	Practical
Teaching Hours	2	2	-

2. Course Aims:

No.	Aims
6	Analyze data from the intended tests to manage resources creatively.
8	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess the environmental impacts of projects.

3. Competencies:

Competencies	Learning Outcomes (LOs)
C3 Apply engineering design processes	a2 Understand engineering solutions' professional
to produce cost-effective solutions that	ethics and impacts on society and the environment.
meet specified needs with consideration	b1 Judge engineering decisions considering balanced
for global, cultural, social, economic,	costs, benefits, safety, quality, reliability, and
environmental, ethical, and other aspects	environmental impact.
as appropriate to the discipline, and	c2 Applying engineering design procedures to generate
within the principles and contexts of	cost-effective solutions while adhering to sustainable
sustainable design and development.	design and development principles and contexts.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	 a2 List the engineering-related business and management principles. c2) Use fundamental organizational and project management abilities.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Importance, Definition, and Historical Development for Visibility Study	2	2	-
2	Project Essence and Its Principles and Forms	4	4	-
3	Initial Visibility Studies and Its Elements	2	2	-





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4	Environmental Visibility Study	2	2	-
5	Important Financial, Monetary, and Marketing Sides in	4	4	
3	Visibility Study			-
6	Exhibition of Products and Effective Parameters in It	2	2	-
7	Pricing Policies	2	2	-
0	The Situation of Government, Consumer, and Competitive	2	2	
0	Projects			-
9	Engineering and Technical Visibility for The Project	4	4	-
10	Social Visibility Study	2	2	-
11	Evaluation Methods of Visibility Study	2	2	-
	Total	28	28	_

5. Teaching and Learning Methods:

No.	Topics	Face-To-Face Lecture	Online Lecture	Flipped Classroom	Presentation and Movies	Discussion	Problem-Solving	Brain Storming	Projects	Site Visits	Self-Learning and Research	Cooperative	Discovering	Modeling	Lab
1	Importance, Definition, and Historical Development for Visibility Study		\checkmark		\checkmark										
2	Project Essence and Its Principles and Forms	\checkmark				\checkmark									
3	Initial Visibility Studies and Its Elements	\checkmark				\checkmark									
4	Environmental Visibility Study														
5	Important Financial, Monetary, and Marketing Sides in Visibility Study	\checkmark						\checkmark							
6	ExhibitionofProductsandEffectiveParameters in It		\checkmark		\checkmark										





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7	Pricing Policies									
8	The Situation of Government, Consumer, and Competitive Projects			\checkmark						
9	Engineering and Technical Visibility for The Project	\checkmark			\checkmark					
10	Social Visibility Study		\checkmark	\checkmark						
11	Evaluation Methods of Visibility Study	\checkmark					\checkmark			

6. Teaching and Learning Methods for Disabled Students:

No.	Teaching Method	Reason					
1	Presentation of The Course in Digital Material	Better Access at Any Time					
2	Wed Communication with Students	Better Communication with Certain Cases					
3	Asking Small Groups to Do Assignments; Each Composed of Low, Medium, and High- Performance Students	Knowledge and Skills Transfer Among Different Levels of Students					
4	An Electronic Model System for The Institution	E. Learning					

7. Student Evaluation:

7.1 Student Evaluation Method:

No.	Evaluation Method	Competencies	LOs
1	Semester Werks (Ovinnes Sheets Benerts)	C3	a2, b1, c2
	Semester works (Quizzes, Sheets, Reports)	C4	a2, c2
2	Mid-Term Exam	C3	a2, b1, c2
		C4	a2, c2
3	Final-Term Exam	C3	a2, b1, c2
		C4	a2, c2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester Works (Quizzes, Sheets, Reports)	$4^{th}, 11^{th}$
2	Mid-Term Exam	8 th
3	Final-Term Exam	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Semester Works (Quizzes, Sheets, Reports)	20%
2	Mid-Term Exam	20%
3	Final-Term Exam	60%
	Total	100%





8. List of References:

No.	Reference List				
1	Wiley-Blackwell. Code of Practice for Project Management for Construction and				
I	Development. Chartered Institute of Building (Great Britain).				
n	Kerzner, Harold. Project Management Workbook. A System Approach to Planning,				
2	Scheduling, and Control.				
2	de Marco, A. Project Management for Facility Constructions A Guide for Engineers, and				
3	Architects.				
1	Project Management Institute and Project Management Institute. A Guide to the Project				
⁴ Management Body of Knowledge (PMBOK Guide).					
	Lester, Albert. Project Management, Planning, and Control. Managing Engineering,				
ס	Construction, and Manufacturing Projects to PMI, APM, and BSI Standards.				
6	Vanhoucke, M. Management for Professionals Integrated Project Management and Control.				

9. Facilities Required for Teaching and Learning:

Facility							
1	Lecture Classroom	3	White Board				
2	Seminar	4	Data Show System				

10. Matrix of Knowledge and Skills:

No.	Торіс	Aims	Competencies	LOs
1	Importance, Definition, and Historical	6.8	C3	a2, b1, c2
-	Development for Visibility Study	0, 0	C4	a2, c2
2	Project Essence and Its Principles and Forms	68	C3	a2, b1, c2
2	Troject Essence and its Trinciples and Torins	0, 0	C4	a2, c2
3	Initial Visibility Studies and Its Flements	6.8	C3	a2, b1, c2
3	initial visionity studies and its Elements	0, 8	C4	a2, c2
4	Environmental Visibility Study	6, 8	C3	a2, b1, c2
5	Important Financial, Monetary, and Marketing	68	C3	a2 b1 c2
-	Sides in Visibility Study	0,0		uz, 01, 02
6	Exhibition of Products and Effective Parameters in	6.8	C3	a2, b1, c2
U	It	0, 0	C4	a2, c2
7	Pricing Policies	6, 8	C3	a2, b1, c2
0	The Situation of Government, Consumer, and	6 9	C3	a2, b1, c2
0	Competitive Projects	0, 0	C4	a2, c2
0	Engineering and Technical Visibility for The	6 9	C3	a2, b1, c2
9	Project	0, 8	C4	a2, c2
10	Social Visibility Study	6, 8	C3	a2, b1, c2
11	Evaluation Mathada of Visibility Study	6 9	C3	a2, b1, c2
11	Evaluation Methods of Visibility Study		C4	a2, c2

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





<u>River Engineering</u> (CIE535)

1. Basic Information

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	River Engineering
Course Code	CIE535
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre-request	Complete 100 h

Taaahing hauna	Lectures	Tutorial	Practical
reaching nours	2	4	-

2. Course Aims:

No.	Aims
4	Use the techniques, skills, and current engineering tools required for river engineering
4	problems regarding the classifications of rivers, velocity, and flow rate measurements.
7	Achieve an optimum design for hydraulics structures on rivers such as dams, spillways, gates,
	and pumping stations.
10	Select appropriate and sustainable technologies for river velocity, flow rate measurements, and
	sediment control

3. Competencies:

Competencies	Learning outcomes (LO'S)
	a1 Describe the relevant mathematical.
C1 Identify, formulate, and solve complex	principles and theories in the discipline concepts
river engineering problems by applying	regarding velocity, and flow rate measurements,
engineering fundamentals, basic science, and	and sediment control.
mathematics.	a3 Explain the principal types of river hydraulic
	structures as dams, spillways, and gates.
	al Recognize the fundamentals of technologies for
	river velocity, sedimentation control, and flow rate
C11 Select appropriate and sustainable	measurements.
technologies for river velocity, sedimentation,	a2 Summarize, appropriate and sustainable
and flow rate measurements.	technologies for dam and spillway construction.
	c1 Using numerical techniques for rivers, velocity,
	and flow rate measurements.
C12 Ashieve an entimum design of dama	b1 Achieve an optimum design of dams, and
ciz Achieve an optimum design of dams,	spillway structures.
gates, and spinway construction.	b2 Achieve an optimum design of hydraulic
	structures gates.



4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Classifications of rivers, data collection method; velocity and flow rate measurements.	6	6	-
2	Design of hydraulic structures: dike, spillway, dam	14	14	-
3	Countermeasure on sediment control; corrosion deposition scour	8	8	-
	Total	28	28	-

5. Teaching and Learning Methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	qel
Classifications of rivers, data collection method; velocity and flow rate measurements.	X	X			X	X	X							
Design of hydraulic structures: dike, spillway, dam	X	X			X	x	X							
Countermeasure on sediment control; corrosion deposition scour	x	х			X	x	X							

6. Teaching and Learning Methods of disabled Students:

No.	Teaching Method
1	Additional Tutorials
2	Online lectures and assignments

7. Student assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	Competencies	LOs
		C1,	a1, a3
1	Mid Term Examination (written/ online)	C11,	a1, a2, c1
		C12	b1
2	Formative (quizzes- online quizzes- presentation)	C1,	a1, a3





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		C11,	a1, a2, c1
		C12	b1
		C1,	a1, a3
3	Final Term Examination (written)	C11,	a1, a2, c1
		C12	b1, b2

7.2 Assessment Schedule:

	sessment seneduce.	
No.	Assessment Method	Weeks
1	Mid Term Examination (written/ online)	8th
2	Practical/ Oral Examination	15th
3	Formative (quizzes- online quizzes presentation-Tutorial and report assessment)	Every week
4	Final Term Examination (written)	Decided by Faculty Council
= 0 XX		

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination (written/ online)	20%
2	Formative (quizzes- online quizzes presentation-Tutorial and report assessment)	20%
3	Final Term Examination (written)	60%
	Total	100%

8. List of References:

No.	References
1	EBEED, G.s. "Lecture Notes on Design of irrigation Structures" Ain shams University,
1	faculty of Engineering, 2020.
C	ASWA G.L., "irrigation and water Resources Engineering", New international (p) limited,
2	publishers, Ansari Road Daryagauj, New Delhi,2018.

9. Facilities Required for Teaching and Learning:

No.	Facility						
1	Lecture Classroom	3	White Board				
2	Lab Facilities	4	Data Show System				
5	Presenter						

10. Matrix of Knowledge and Skills of the Course

No.	Торіс	Aims	Competencies	LO's
1	Classifications of rivers, data collection method; velocity and flow rate measurements.	4	C1 C11	a1 a1. a2. c1
2	Design of hydraulic structures: dike, spillway, dam, gate, pumping stations, sheet pile.	7	C1, C11, C12	a3 a1, a2 b1
3	Countermeasure on sediment control; corrosion deposition scour, bill of quantity	4, 10	C1 C11	al al

Course Coordinator Assoc. Prof. Dr. Mohammed Gabr **Head of Department:** Prof. Dr. Mohammed Elkiki **Date of Approval:** 2022







<u>Traffic Control Systems</u> (CIE538)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Traffic Control Systems
Course Code	CIE538
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre- request	Complete 100 h

Teaching hours	Lectures	Tutorial	Practical	
Teaching hours	2	2	-	

2. Course Aims

No.	Aims
	Use the techniques, skills, and current engineering tools required for engineering practice by
4	taking full responsibility for one's own learning and development, participating in lifelong
	learning, and demonstrating the ability to pursue postgraduate and research studies.
7	Achieve an optimum design of traffic control systems strategies for intersections and arterials
	or any other emerging field relevant to the discipline.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	a2 Explain the scientific principles and theories that apply to the topic.b3 Applying engineering basics that are relevant to the subject.
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.	 b2 Conduct basic experiments to learn about the applications of traffic control strategies and concepts. b4 Evaluate components, systems, and processes are evaluated for their characteristics and performance. c1 Choose relevant mathematical and computerbased methodologies for problem modelling and analysis.
C11 Select appropriate and sustainable technologies for traffic networks control systems	a2 Summarize, appropriate and sustainable technologies for evaluating effectiveness of traffic control systems .





4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Introduction to existing and new traffic control systems strategies including both off-line signal optimization techniques and real-time computer traffic-responsive control concepts	8	8	-
2	Control concepts and methods for signal intersections, arterial systems, and area traffic networks.	10	10	-
3	Traffic control system evaluation techniques using measures of effectiveness (M.O.E) for signal intersections, arterial, and networks.	10	10	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Introduction to existing and new traffic control systems strategies including both off- line signal optimization techniques and real- time computer traffic-responsive control concepts	x	x			x	x	х							
Control concepts and methods for signal intersections, arterial systems and area traffic networks.	х	x			x	x	x							
Traffic control system evaluation techniques using measures of	x	x			x	x	x							







effectiveness (M.O.E) for signal							
intersections,							
arterial, and							
networks.							

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed	Knowledge and skills transfer
2	of low, medium, and high-performance students.	among different level of students.

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C1	a2, b3
1	Mid-term examination	C2	b2, b4, c1
		C11	a2
	Semester work	C1	a2, b3
2		C2	b2, b4, c1
		C11	a2
		C1	a2, b3
3	Final term examination	C2	b2, b4, c1
		C11	a2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Semester work	2nd, 7th, 9th
2	Mid Term examination	8th
3	Final term examination	15 <i>th</i>

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Essential books (textbooks): Transportation Engineering, an Introduction, C. Jotin Khisty, Prentice Hall, Englewood Cliffs, New Jersey, 1990. Traffic Engineering, William R. McShane, Prentice Hall, Englewood Cliffs, New Jersey, 1990.
2	Recommended books: Ott, Introduction to Statistical Methods and Data Analysis, PWS-Kent, 1990.



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Control of traffic systems in buildings, 2006 sandro marken

9. Facilities required for teaching and learning:

Facility			
1	Lecture classroom	3	White board
2	Seminar	4	Data show system

10. Matrix of knowledge and skills of the course:

No.	Торіс	Aims	Competencies	LO's
1	Introduction to existing and new traffic control systems strategies including both offline signal optimization techniques and real-time computer traffic-responsive control concepts	4, 7	C1 C2 C11	a2, b3 b2, b4, c1 a2
2	Control concepts and methods for signal intersections, arterial systems, and area traffic networks.	4, 7	C1 C2 C11	a2, b3 b2, b4, c1 a2
3	Traffic control system evaluation techniques using measures of effectiveness (M.O.E) for signal intersections, arterial, and networks.	4, 7	C1 C2 C11	a2, b3 b2, b4, c1 a2

Course Coordinator: Assoc. Prof. Dr. Alaa Gabr **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Reinforced Concrete (4) (CIE539)

1. Basic Information:

Civil Engineering Program
Civil Engineering Department
Civil Engineering Department
Reinforced Concrete (4)
CIE539
Level 5
Minor – Elective Course
-
Complete 100 h

Teaching hours	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims:

No.	Aims	
	Use the techniques, skills, and current engineering tools required for engineering practice by	
4	taking full responsibility for one's own learning and development, participating in lifelong	
	learning, and demonstrating the ability to pursue postgraduate and research studies.	
7	Achieve an optimum design of Reinforced.	
10	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using numerical techniques, experiment measurements, and testing by applying a full range of civil engineering fields such as structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology and fluid	
	mechanics.	

3. Intended Learning Outcomes (LO'S):

Competencies	Learning Outcomes (LO'S)
C6 Plan, supervise and monitor implementation of	al Show the appropriate and sustainable
engineering projects, taking into consideration other	technologies for construction of buildings,
trades requirements.	infrastructures, and water structures.
C11 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.	 a1 Recognize the different engineering principles related to the design of reinforced concrete. a2 Summarize, appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures.
C12 Achieve an optimum design of Reinforced	b1 Achieve an optimum design of Reinforced
Concrete and Steel Structures, Foundations and	Concrete structures.
Earth Retaining Structures; and at least three of the	
following civil engineering topics: Transportation	




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and Traffic, Roadways and Airports, Railways,	
Sanitary Works, Irrigation, Water Resources and	
Harbors; or any other emerging field relevant to the	
discipline.	

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Introduction	2	2	-
2	Design of un-cracked sections	6	6	-
3	Design of rectangular tanks	6	6	-
4	Design of Circular tanks	6	6	-
5	Design of elevated tanks	8	8	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Introduction		x						X						х
Design of un-cracked sections		X						x						x
Design of rectangular tanks		X						x						x
Design of Circular tanks		X						x						x
Design of elevated tanks		x						x						x

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason			
1	Presentation of the course in digital material	Better access any time			
2	Asking small groups to do assignments; each composed	Knowledge and skills transfer			
2	of low, medium, and high-performance students.	among different level of students.			

7. Student evaluation:





7.1 Student evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid Torm Examination	C6	al
		C11	al
2	Semester work	C11	a1, a2
		C6	al
3	Final Term Examination	C11	a1, a2
		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks				
1	Semester work	2 nd ,7 th , 9 th				
2	Mid Term examination	8 th				
3	Final term examination	15 th				

7.3 Weighting of Evaluation:

No.	Evaluation method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
	Chmielewski, Ryszard, Leopold Kruszka, and Paweł Muzolf. "The selection of methods for
1	strengthening of the reinforced-concrete structure of the open tank." Case Studies in
	Construction Materials 12 (2020): e00343.
	Nallanathel, Mr Manoj, Mr B. Ramesh, and L. Jagadeesh. "Effective Utilization of Staad Pro
2	in The Design and Analysis of Water Tank." International Journal of Pure and Applied
	Mathematics 119.17 (2019)
2	Design of Reinforced Concrete Structures Design of reinforced concrete structures, Magdy
3	Abd EL-Hameed Tayel, 2019
4	Design of reinforced concrete Water Tanks, Khalil Ibrahim Waked, Scientific Book House
4	for Publishing& Distributing, 2018
5	Simple Examples of Reinforced Concrete Design, Oscar Faber, Edition 4, Oxford University
3	Press, 1952, 2018

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system





10. Matrix of knowledge and skills of the course:

No.	Торіс	Aims	Competencies	LO's
1	Introduction	7	C6	al
2	Design of un-cracked sections	10	C11	a1, b1
		10	C12	al
3	Design of rectangular tanks	10	C11	a1, b1
			C12	al
1	Design of Circular tanks	10	C11	a1, b1
4			C12	al
5	Design of gyimming nools	10	C11	a1, b1
5	Design of swimming pools	10	C12	al

Course Coordinator: Prof. Dr. Khaled Fawzy **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Tunneling and Underground Excavation</u> (CIE540)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Tunneling and Underground Excavation
Course Code	CIE540
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre- request	Complete 100 h

Tasshinghoung	Lectures	Tutorial	Practical
l eaching nours	2	2	-

2. Course Aims

No.	Aims
4	Use the techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development, participating in lifelong
7	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	Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using numerical techniques, experiment measurements, and testing by applying a full range of civil engineering fields such as structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology and fluid mechanics.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
	a2 Define the principles, basic properties, and
C2 Develop and conduct appropriate simulation,	features of construction material, as well as
analyze, and interpret data, assess, and evaluate	their use in sustainable technologies for
findings, and use statistical analyses and objective	construction of buildings, infrastructures.
engineering judgment to draw conclusions.	c3 Applying statistical analyses and objective
	engineering judgment to draw conclusions.
C4 Utilize contemporary technologies, codes of	
practice and standards, quality guidelines, health	b1 Create methodical approaches when dealing
and safety requirements, environmental issues, and	with new and advancing technology.
risk management principles.	





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C6 Plan, supervise and monitor implementation of	al Show the appropriate and sustainable			
engineering projects, taking into consideration	technologies for construction of buildings,			
other trades requirements	infrastructures, and water structures.			
C9 Utilize codes of practice	d1 Describe codes of practice.			
C12 Achieve an optimum design of Tunneling and	b1 Achieve an optimum design of Reinforced			
underground Excavation	Concrete			

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Introduction to tunnels	2	2	-
2	numerical methods in tunnel constructions	4	4	-
3	Computer software packages and its applications in tunnels.	4	4	-
4	Tunneling and excavations in hard rock	4	4	-
5	Basic rock mechanics, shape, size and orientation of an opening, elastic deformation and the Kirsch solution, rock mass classification, support design and ground reaction curve, drill and blast method, NATM tunneling method. Tunneling in soft ground	4	4	-
6	problems of urban tunneling, deformation and surface settlement, load on liners, face stability, methods of soft ground tunneling including EPB and slurry shield methods	4	4	-
7	Selection of methods of attack for excavation of tunnels and deep vertical sided openings. Tunneling procedures based on behavioral characteristics of soil and rock, study of tunnel boring machines, shielded and drill-and-blast operations, linings, soil linear interaction. Deep excavation procedures related to support of excavation systems, methods of installation and dewatering.	6	6	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
Introduction to tunnels	х	х			х	х	х							
numerical methods in tunnel constructions	X	x			X	X	x							





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Computer software packages and its applications in tunnels.	х	х		х	х	х				
Tunneling and excavations in hard rock	х	x		х	x	х				
Basic rock mechanics, shape, size and orientation of an opening, elastic deformation and the Kirsch solution, rock mass classification, support design and ground reaction curve, drill, and blast method, NATM tunneling method. Tunneling in soft ground	X	X		X	X	X				
problems of urban tunneling, deformation and surface settlement, load on liners, face stability, methods of soft ground tunneling including EPB and slurry shield methods	x	x		x	x	x				
Selection of methods of attack for excavation of tunnels and deep vertical sided openings. Tunneling procedures based on behavioral characteristics of soil and rock, study of tunnel boring machines, shielded and drill-and- blast operations, linings, soil linear interaction. Deep excavation procedures related to support of excavation systems, methods of installation and dewatering.	x	x		x	x	x				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid-term examination	C2 C4	a2, c3 b1





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		C6	al
		C2	a2, c3
2	Semester work	C4	b1
Z		C6	al
		С9	d1
	Final term examination	C2	a2, c3
		C4	b1
3		C6	al
		С9	d1
		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks			
1	semester work	continuous evaluation			
2	Mid Term examination	8 <i>th</i>			
4	Final term examination	15 <i>th</i>			
7.3 Weighting of Evaluation:					

No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Design and construction of tunnels, pietrolanaridi, 2018
2	Tunneling and tunnel mechanio, Dimitrioskolymbas 2020
3	Course notes:
	Lecture notes prepared by the course coordinator +Solved examples.
4	Das, B., M. (2017), "Principles of Foundation Engineering ", CENGAGE Learning,
5	Gulhati, S.K. and Datta, M. (2015), "Geotechnical Engineering ", Tata McGraw-Hill, New
3	Delhi.
6	Essential books (textbooks):
	Egyptian Code of Practice for Soil Mechanics and Foundations (2002)

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system





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10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction to tunnels	4710	C2	a2, c3
1		1,7,10	C4	b1
2	numerical methods in tunnel constructions	4.7.10	C2	a2, c3
			<u>C9</u>	dl
	Computer software packages and its applications in		C2	a2, c3
3	tunnels.	4,7,10	C9	dl
			C12	bl
4	Tunneling and excavations in hard rock	4.7.10	C2	a2, c3
			<u>C9</u>	dl
	Basic rock mechanics, shape, size and orientation of		G2	
-	an opening, elastic deformation and the Kirsch	4 7 10	C2	a2, c3
5	solution, rock mass classification, support design and	4,7,10	C9	dl 11
	ground reaction curve, drill, and blast method, NATM		CIZ	61
	tunneling method. Tunneling in soft ground.			
	load on liners, face stability, problems of urban		C2	a2, c3
6	tunneling, deformation and surface settlement	4,7,10	С9	d1
	alumny shield methods		C12	b1
	Surry smeld methods			
	Selection of methods of attack for excavation of			
	tunnels and deep vertical sided openings. Tunneling			
	and reak study of turnal baring machines shielded		C2	a2, c3
7	and fock, study of tunner borning machines, smelled	4,7,10	C9	d1
	interaction Doop execution precedures related to		C12	b1
	support of excavation systems methods of			
	installation			
L	mountation.			

Course Coordinator: Dr. Hany Hashish **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Urban Transportation Planning</u> (CIE541)

1. Basic Information

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Urban Transportation Planning
Course Code	CIE541
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre- request	Complete 100 h

Teaching hours Lectures	Tutorial	Practical	
reaching nours	2	2	-

2. Course Aims:

No.	Aims
4	Use the techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development, participating in lifelong learning, and demonstrating the ability to pursue postgraduate and research studies.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C2 Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate transportation systems,	 a2 Summarize, appropriate of sustainable technologies for urban planning. b2 Conduct basic experiments to learn about the applications of urban planning, transportation planning
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.	c1 Incorporate economic, societal, global, environmental impact of urban planning techniques.
C11 Select appropriate and sustainable technologies for urban planning design	a2 Achieve an optimum design of works for urban planning, city streets, and environments.
C12 Achieve an optimum design for Transportation and Traffic, Roadways and	 b1 Achieve the design of road. b2 Achieve an optimum design of works for transportation and traffic, roadways and airports, railways, sanitary works, irrigation, water resources





	and harbors; or any other emerging field relevant to the discipline.
C13 Plan and manage planning processes; maintain safety measures in urban planning process; and assess environmental impacts of	a1 define plan and mange urban planning process and transportation systems.c1 Assess environmental impacts of transportation
projects.	projects.

4. Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Measures of flow, speed, and Density	2	2	-
2	Statically of traffic characteristics (travel time, delay, speed, pedestrians, parking, and accident studies	2	2	-
3	Traffic signals	2	2	-
4	Parking garages and terminals design	2	2	-
5	Freeway surveillance and control	2	2	-
6	General characteristics of transportation: streets, highways, rail, transit, water, and pipelines. Egypt transport system: on overview	2	2	-
7	Fundamentals of traffic flow: time space diagrams, capacity analysis	2	2	-
8	control, IVHS, public issues and administration	4	4	-
9	Transport system design: characteristics of driver, vehicle, and road. Route location , horizontal, an. Vertical alignment, earthwork, drainage, and pavements	2	2	-
10	Economic evaluation, system operation, maintenance, and rehabilitation	4	4	-
11	Environmental impacts, various laboratory experiments and design projects supplement the subject matter	4	4	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
Measures of flow, speed, and Density	х	x			x	x	x							
Statically of traffic characteristics (travel time,	x	X			x	x	x							





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							-			
delay, speed, pedestrians, parking and accident studies										
Traffic signals	х	x		х	х	x				
Parking garages and terminals design	x	x		x	x	x				
Freeway surveillance and control	х	x		x	x	x				
General characteristics of transportation: streets, highways, rail, transit, water, and pipelines. Egypt transport system: on overview	x	x		x	x	x				
Fundamentals of traffic flow: time space diagrams, capacity analysis	X	x		x	x	x				
control, IVHS, public issues and administration	x	x		x	x	x				
Transport system design: characteristics of driver, vehicle, and road. Route location , horizontal, an. Vertical alignment, earthwork, drainage and pavements	X	X		X	X	X				
Economic evaluation, system operation, maintenance, and rehabilitation	X	X		X	X	X				
Environmental impacts, various laboratory experiments and design projects supplement the subject matter	x	x		x	x	x				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each. composed of low, medium, and high- performance students	Knowledge and skills transfer among different levels of students





4	Electronic model system for the Institution.	E. learning
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7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Midterm examination	C2 C12	a2, b2 b2
2	Semester work (quizzes, sheets, report)	C2	a2, c2
3	Final term examination	C2 C11 C12	a2, b2, c2 a1 b2

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8th
2	Semester work	7th - 9th
3	Final term examination	15th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. 8-List of References:

No.	Reference List
1	Ott, Introduction to Statistical Methods and Data Analysis, PWS-Kent, 2019
2	Simulation of urban transport system, slim hammed and mekkiksouri, fib 2021
3	Urban dynamics and simulation models, densipumai, romainreuillon, 2020

9. Facilities required for teaching and learning:

No.	Facility
1	Seminar
2	Lecture Classroom
3	White Board
4	Data Show system

10. Matrix of knowledge and skills of the course:

No.	Торіс	Aims	Competencies	LO's
1	Land use-transportation interaction	2, 8	C2	a2
2	The process of Urbana transportation planning, urban transport problems, goals, and objectives, data and information, Survey design, travel demand for casting: 1) trip generations, 2) trip distribution, 3) modal choice, 4) route assignment.	2, 8	C2, C13	a2, c2 a1
3	The evaluation of urban transport system,	2,8	C2	a2, b2





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			C12	b2
4	transport system management	28	C2	a2
4	transport system management	2, 0	C12	b2
			C2	a2, c2
5	demand management, and control	2, 8	C12	b2,
			C13	c 1

Course Coordinator: Assoc. Prof. Dr. Alaa Gabr **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Special Concrete Structures (1)</u> (CIE542)

1. Basic Information:

Program Title	Civil Engineering Program	
Department Offering the Program	Civil Engineering Department	
Department Responsible for the Course	Civil Engineering Department	
Course Title	Special Concrete Structures (1)	
Course Code	CIE542	
Year/Level	Level 5	
Specialization	Minor – Elective Course	
Authorization Date of Course Specification	-	
Pre- request	Complete 100 h	

Teeching hours	Lectures	Tutorial	Practical
Teaching nours	2	2	-

2. Course Aims

No.	Aims
	Use the techniques, skills, and current engineering tools required for engineering practice by
4	taking full responsibility for one's own learning and development, participating in lifelong
	learning, and demonstrating the ability to pursue postgraduate and research studies.
7	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.
	Select appropriate and sustainable technologies for construction of buildings. using numerical
10	techniques, experiment measurements, and testing by applying a full range of civil
	engineering fields such as structural analysis and mechanics, properties and strength of
	materials, surveying.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C2 Develop and conduct appropriate simulation, analyze, and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	 a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings, infrastructures. c3 Applying statistical analyses and objective engineering judgment to draw conclusions.
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	b1 Create methodical approaches when dealing with new and advancing technology.





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	al Show the appropriate and sustainable technologies for	
C6 Plan, supervise and monitor	construction of buildings, infrastructures, and water	
implementation of engineering projects,	structures.	
taking into consideration other trades	c1 Conduct experimental work related to the reinforced	
requirements.	concrete and steel structures, foundations and earth	
	retaining structures.	
C9 Utilize codes of practice	d1 Describe codes of practice.	
C12 Achieve an optimum design of	h1 Ashieve on antimum design of Dainformed Congrets	
Concrete structure.	bi Achieve an optimum design of Reinforced Concrete	

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Introduction to tall building structures	14	14	-
2	Design criteria for tall building structures – loading - structural formation – modeling for analysis – braced frames – rigid frames – shear walls	14	14	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
Introduction to tall building structures		X					X	x						x
Design criteria for tall building structures – loading – structural formation – modeling for analysis – braced frames – rigid frames – shear walls		x					X	x						x





6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid-term examination	C2 C9	a2, c3 a1
2	Semester work	C2 C9	a2, c3 a1
3	Final term examination	C2 C9 C12	a2, c3 al b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	2nd,7th,9th
2	Mid Term examination	8th
3	Practical Examination	14th
4	Final term examination	15 <i>th</i>

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	EL-Metwally, S.E., and Hosny, H.M.H., "Design Fundamental of Structure Concrete.". Utilities and Urban Communities, "Egyptian Code for Design and Construction of Reinforced Concrete Structures."Cairo 2020.
2	Cairo. 2018. EL-Behairy, S., "Reinforced Concrete Design Handbook, ". Gouda M. A., Helmy, M., and Korshe, I., "Basic Design of Reinforced Concrete Structures. "Alexandria. 2015.

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar





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3	White board
4	Data Show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction to tall building structures	4,7,10	C2	a2
2	Design criteria for tall building structures – loading - structural formation – modeling for analysis – braced frames – rigid frames – shear walls	4,7,10	C2 C9 C12	a2, c3 a1 b1

Course Coordinator: Dr. Shady Ragheb **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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Foundation Engineering (2) (CIE543)

1. Basic Information:

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Foundation Engineering (2)
Course Code	CIE543
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre- request	Completing of 100 hr. + CIE505

Taaabing bourg	Lectures	Tutorial	Practical	
Teaching nours	2	2	-	

2. Course Aims

No.	Aims
	Use the techniques, skills, and current engineering tools required for engineering practice by
4	taking full responsibility for one's own learning and development, participating in lifelong
	learning, and demonstrating the ability to pursue postgraduate and research studies.
	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and
7	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.
	Select appropriate and sustainable technologies for construction of buildings, infrastructures,
	and water structures; using numerical techniques, experiment measurements, and testing by
10	applying a full range of civil engineering fields such as structural analysis and mechanics,
	properties and strength of materials, surveying, soil mechanics, hydrology and fluid
	mechanics.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	 a3 Explain the basic principles of engineering. b3 Applying engineering basics that are relevant to the subject. c3 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals.
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.	c2 Develop suitable experimentation and/or simulation.





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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.	c2 Applying engineering design procedures to generate cost-effective solutions while adhering to the principles and contexts of sustainable design and development
C4 Utilize contemporary technologies, codes of practice and standards, quality guidelines and safety requirements.	a1 Describe quality assurance systems, codes of practice, and standards.
C12 Achieve an optimum design of foundations.	b1 Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures.

4. Course Contents:

No.	Topics	Lectures	Tutorial	Practical
1	Hydraulics of soils	4	4	-
2	Flow net in soil	6	6	-
3	Application of flow	6	6	-
4	Deep foundation	6	6	-
5	Sheet piles	6	6	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
Hydraulics of soils	x	х			x	x	x							
Flow net in soil	x	х			x	x	x							
Application of flow	х	х			x	x	x							
Deep foundation	x	Х			x	x	x							
Sheet piles	x	Х			x	х	х							

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases





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3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C1	a3, b3, c3
1	Midterm examination	C2	c2
		C3	c2
		C2	c2
2	Semester work (quizzes, sheets, report)	C3	c2
		C4	al
		C1	a3, b3, c3
		C2	c2
3	Final term examination	C3	c2
		C4	al
		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Midterm examination	8th
2	Semester work	continuous evaluation
3	Final term examination	15 th

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Midterm examination	20%
2	Semester work	20%
3	Final term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Course notes:
	Lecture notes prepared by the course coordinator +Solved examples.
2	Das, B., M. (2017), "Principles of Foundation Engineering ", CENGAGE Learning,
3	Gulhati, S.K. and Datta, M. (2015), "Geotechnical Engineering", Tata McGraw-Hill, New
	Delhi.
4	Essential books (textbooks):
	Egyptian Code of Practice for Soil Mechanics and Foundations (2002)





9. Facilities required for teaching and learning:

	Facility				
1	Lecture classroom	3	White board		
2	Seminar	4	Data show system		

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
			C1	a3, b3, c3
1	Hydraulics of soil	4,7,10	C2	c2
			C3	c2
			C1	a3, b3, c3
2	Flow net in soil	4,7,10	C2	c2
			C3	c2
		4,7,10	C2	c2
3	Application of flow		C3	c2
			C4	al
		4,7,10	C2	c2
4	Deep foundation		C3	c2
			C4	al
			C1	a3, b3, c3
			C2	c2
5	Sheet pile	4,7,10	C3	c2
			C4	al
			C12	b1

Course Coordinator: Dr. Hany Hashish **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Special Concrete Structures (2)</u> (CIE544)

1. Basic Information:

Program Title	Civil Engineering Program		
Department Offering the Program	Civil Engineering Department		
Department Responsible for the Course	Civil Engineering Department		
Course Title	Special Concrete Structures (2)		
Course Code	CIE544		
Year/Level	Level 5		
Specialization	Minor – Elective Course		
Authorization Date of Course Specification	-		
Pre- request	Complete 100 h + CIE539		

Teaching hours Lectures	Tutorial	Practical	
Teaching nours	2	2	-

2. Course Aims

No.	Aims
	Use the techniques, skills, and current engineering tools required for engineering practice by
4	taking full responsibility for one's own learning and development, participating in lifelong
	learning, and demonstrating the ability to pursue postgraduate and research studies.
	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and
7	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.
	Select appropriate and sustainable technologies for construction of buildings. using numerical
10	techniques, experiment measurements, and testing by applying a full range of civil
	engineering fields such as structural analysis and mechanics, properties, and strength of
	materials.

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C2 Develop and conduct appropriate simulation, analyze, and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	 a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings, infrastructures, and water structures. c3 Applying 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	c2 Applying engineering design procedures to generate cost-effective solutions while adhering to the principles and contexts of sustainable design and development.





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principles and contexts of sustainable design and development.	
C4 Utilize codes of practice	c3 Describe codes of practice.
C6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements	c1 Conduct experimental work related to the reinforced concrete and steel structures, foundations and earth retaining structures.
C9 Achieve an optimum design of	d1 Achieve an optimum design of Reinforced
Reinforced Concrete.	Concrete
C12 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.	b1 Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures.

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Introduction to composite construction	2	2	-
2	Materials of composite structures	6	6	-
3	Simply supported composite beams	6	6	-
4	Continuous supported composite beams	6	6	-
5	Shear connections – composite columns – composite slabs	8	8	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
Introduction to composite construction		х			х			x						x
Materials of composite structures		X			X			X						x





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Simply supported composite beams	X		x		x			x
Continuous supported composite beams	X		X		х			х
Shear connections – composite columns – composite slabs	X		X		х			x

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason		
1	Presentation of the course in digital material	Better access any time		
2	Wed communication with students	Better communication with certain cases		
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students		
4	Electronic model system for the Institution.	E. learning		

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid torm examination	C2	a2, c3
1		C9	a1, b1
2	Some option area als	C2	a2, c3
2	Semester work	C9	al
		C2	a2, c3
3	Final term examination	С9	a1
		C12	b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	2nd,7th, 9th
2	Mid Term examination	8th
3	Practical Examination	14 th
4	Final term examination	15 <i>th</i>

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%





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3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List							
	EL-Metwally, S.E., and Hosny, H.M.H., "Design Fundamental of Structure Concrete."							
1	1 Ministry of Housing. Utilities and Urban Communities, "Egyptian Code for Design and							
	Construction of Reinforced Concrete Structures. "Cairo 2020.							
2	Hilal.M.,"Reinforced Concrete Water Tanks." Marcou							
3	Hilal M., "Design of Reinforced Concrete Halls," 2018							

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Introduction to composite construction	4,7,10	C2	a2
			C2	a2, c3
2	Materials of composite structures	4,7,10	C9	al
			C12	b1
3	Simply supported composite beams	4,7,10	C2	a2
4	Continuous supported composite hooms	4710	C2	a2, c3
4	Continuous supported composite deams	4,/,10	C9	al
			C2	a2, c3
5	Shear connections – composite columns composite slabs	4,7,10	C9	al
			C12	b1

Course Coordinator: Assoc. Prof. Dr. Mohamed Gabr **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022







Railway Engineering (CIE545)

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Responsible for the Course	Civil Engineering Department				
Course Title	Railway Engineering				
Course Code	CIE545				
Year/Level	Level 5				
Specialization	Major				
Authorization Date of Course Specification	-				
Pre- request	Complete 100 h				

Teeching hours	Lectures	Tutorial	Practical		
reaching nours	2	2	-		

2. Course Aims

No.	Aims
7	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	Select appropriate and sustainable technologies for construction of buildings, infrastructures,
	and water structures; using numerical techniques, experiment measurements, and testing by
	applying a full range of civil engineering fields such as structural analysis and mechanics,
	properties and strength of materials, surveying, soil mechanics, hydrology and fluid
	mechanics.

3. Competencies:

Competencies	Learning Outcomes (LO'S)					
C1 Identify, formulate, and solve complex	a3 Explain the basic principles of engineering for					
engineering problems by applying	railways planning.					
engineering fundamentals, basic science,	b2 Using scientific concepts and theories that are					
and mathematics.	relevant to railway engineering.					
	b2 Conduct basic experiments to learn about the					
C2 Develop and conduct appropriate	applications of structural analysis and mechanics,					
experimentation and/or simulation, analyze	properties and strength of materials, surveying, soil					
and interpret data, assess, and evaluate	mechanics, hydrology, and fluid mechanics in the					
findings, and use statistical analyses and	fields of transportation and traffic, roadways and					
objective engineering judgment to draw	airports, railways, sanitary works, irrigation, water					
conclusions.	resources and harbors; or any other emerging field					
	relevant to the discipline.					
C12 Achieve an optimum design of	b2 Achieve an optimum design of works for					
Reinforced Concrete and Steel Structures,	transportation and traffic, roadways and airports,					
Foundations and Earth Retaining Structures;	railways, sanitary works, irrigation, water resources					





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and at least three of the following civil	and harbors; or any other emerging field relevant to
engineering topics: Transportation and	the discipline.
Traffic, Roadways and Airports, Railways,	
Sanitary Works, Irrigation, Water Resources	
and Harbors; or any other emerging field	
relevant to the discipline.	

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Engineering principals for railways planning	2	2	I
2	Railways components and specifications	4	4	-
3	Design of different parts of railways	6	6	-
4	Types of stations	2	2	-
5	Types of signals	2	2	-
6	Maintenance	4	4	-
7	Planning of railways lines	4	4	-
8	8 Transportation economy		2	-
9	Management and insurance.	2	2	-
	Total	28	28	-

5. Teaching and learning methods:

Topics	Face -to-Face Lecture	Online Lecture	Flipped Classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self -learning and Research	Cooperative	Discovering	Modeling	lab
Engineering principals for railways planning	X	X			X	x	X							
Railways components and specifications	X	X			X	X	X							
Design of different parts of railways	X	X			x	x	X							
Types of stations	x	х			х	x	х							
Types of signals	х	х			х	x	х							
Maintenance	х	х			х	x	х							
Planning of railways lines	х	х			х	х	х							





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Transportation economy	x	x		x	x	x				
Management and insurance.	X	х		x	х	x				

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason	
1	Presentation of the course in digital material	Better access any time	
2	Asking small groups to do assignments; each composed of low, medium, and high-performance students.	Knowledge and skills transfer among different level of students.	

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
		C1	a3, b2
1 Mid-term examination	Mid-term examination	C2	b2
		C12	b2
	Semester work	C1	a3, b2
2		C2	b2
		C12	b2
3	Final term examination	C1	a3, b2
		C2	b2
		C12	b2

7.2	Evaluation Schedule:	
No.	Evaluation Method	Weeks
1	semester work	2nd,7th,9th
2	Mid Term examination	8 <i>th</i>
3	Final term examination	15 <i>th</i>

7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights		
1	Mid-term examination	20%		
2	Semester work	20%		
3	3 Final-term examination 60%			
	Total 100%			

8. List of References:

No.	Reference List
1	E. B. Machaly, "Behavior, analysis and design of steel work connections ", vol. 3, 2020
2	Railway development 2018, Dr frank pruinsma and DR Irik pills.





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9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Engineering principles for railways planning	7	C1	a3, b2
2	Railways components and specifications		C1	a3, b2
3	Design of different parts of railways	7	C2 C12	b2 b2
4			C12 C1	a3, b2
	Types of stations	7, 10	C2 C12	b2 b2
5			C1	a3, b2
	Types of signals	7	C2	b2
			C12	b2
6	maintenance	10	C2	b2
	mannenance	10	C12	b2
7	Dianning of milways lines	7	C2	b2
	r fanning of fan ways fines	/	C12	b2
8	Transportation economy	10	C1	a3, b2
9	Management and insurance.	10	C1	a3, b2

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022







Reinforced Concrete (5) (CIE546)

1. Basic Information

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Reinforced Concrete (5)
Course Code	CIE546
Year/Level	Level 5
Specialization	Minor – Elective Course
Authorization Date of Course Specification	-
Pre- request	Complete 100 h + CIE539

Teeching hours	Lectures	Tutorial	Practical
reaching nours	2	2	-

2. Course Aims

No.	Aims	
	Use the techniques, skills, and current engineering tools required for engineering practice by	
4	taking full responsibility for one's own learning and development, participating in lifelong	
	learning, and demonstrating the ability to pursue postgraduate and research studies.	
7	Achieve an optimum design of Reinforced Concrete.	
	Select appropriate and sustainable technologies for construction of buildings. using numer	
10	techniques, experiment measurements, and testing by applying a full range of civil engineering	
	fields such as structural analysis and mechanics, properties, and strength of materials.	

3. Competencies:

Competencies	Learning Outcomes (LO'S)
C2 Develop and conduct appropriate simulation, analyze, and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	 a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings. c3 Applying statistical analyses and objective engineering judgment to draw conclusions.
C9 Utilize codes of practice	d1 Describe codes of practice.
C12 Achieve an optimum design of Reinforced Concrete.	b1 Achieve an optimum design of Reinforced Concrete

4. Course Contents:

No.	Topics	Lecture	Tutorial	Practical
1	Design shell structure	12	12	-
2 design of pre-stressed reinforced concrete		16	16	-
	Total	28	28	-





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5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
Design shell structure		х					х							X
design of pre- stressed reinforced concrete		х					х							х

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Wed communication with students	Better communication with certain cases
3	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
4	Electronic model system for the Institution.	E. learning

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Mid-term examination	C2 C9	a2, c3 a1
2	Semester work	C2 C9	a2, c3 a1
3	Final term examination	C2 C9 C12	a2, c3 a1 b1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	semester work	2nd,7th,9th
2	Mid Term examination	8th
3	Practical Examination	14 th
4	Final term examination	15 <i>th</i>

7.3 Weighting of Evaluation:





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No.	Evaluation Method	Weights
1	Mid-term examination	20%
2	Semester work	20%
3	Final-term examination	60%
	Total	100%

8. List of References:

No.	Reference List
1	Hilal.M.,"Reinforced Concrete Water Tanks." Marcou,
2	Hilal M., "Design of Reinforced Concrete Halls," 2018
3	Reinforced Concrete Design," Cairo Univ., 2019. Abdel Rahman, A.,
4	"Fundamental of Reinforced Concrete Incorporating the Egyptian Code of 2020."

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Data Show system

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	Design shell structure	4,7,10	C2 C9 C12	a2, c3 a1 b1
2	Design of pre-stressed reinforced concrete	4,7 ,10	C2 C9 C12	a2, c3 a1 b1

Course Coordinator: Prof. Dr. Khaled Fawzy **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022





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<u>Training (1)</u> (ENG430)

1. Basic Information

Civil Engineering Program
Civil Engineering Department
Civil Engineering Department
Training (1)
ENG430
Level 4
Major
-
Complete Previous Level

Teaching hours	Lectures Tutorial		Practical
reaching nours	-	-	80

2. Course Aims

No.	Aims
2	Work in and manage a diverse team of professionals from various engineering disciplines,
	taking responsibility for own and team performance; and behave professionally and adhere to
	engineering ethics and standards.
	Communicate effectively with a variety of audiences using a variety of forms, methods, and
5	languages; cope with academic and professional issues in a critical and creative manner; and
	display leadership, business administration, and entrepreneurial abilities.
	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and
7	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.
8	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.

3. Competencies:

Competencies	Learning Outcomes (LO'S)					
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.	 a1 Learn the general principles of design techniques specific to reinforced concrete and steel structures, foundations and earth retaining structures. a2 Understand the professional ethics and impacts of engineering solutions on society and environment. a3 Recognizes the various construction defects, instability and quality issues and assess environmental impacts of projects. b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact. 					





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	c2 Applying engineering design procedures to generate cost-effective solutions while adhering to the principles and contexts of sustainable design and development.
C5 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	 a1 Define technical language and report writing. b1 Assess different ideas, views, and knowledge from a range of sources. c1 Prepare technical reports. d1 Search for information to engage in lifelong self-learning discipline.
C6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	 a) Show the appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures. c2 Acquire entrepreneurial skills.
C7 Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	d1 Collaborate effectively within multidisciplinary team.d2 Work in stressful environment and within constraints.d3 Motivate individuals.
C9 Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	d1Think creatively in solving problems of design.d2 Effectively manage tasks, time, and resources.

4. Course Contents:

No.	Topics	Tutorial	Practical
1	The training aims to explore students' ability and skills to comprehensively address and manage architectural and technical issues.	-	37
2	A complete set of appropriately presented drawings, accompanied by a detailed report of the training's attributable studies and potential considerations should be implemented by each student.	-	5
	Total	-	42

5. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
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The training aims to explore students' ability and skills to comprehensively address and manage architectural and	X			X	x	x		X	X	x		
technical issues												
A complete set of appropriately presented drawings, accompanied by a detailed report of the training's attributable studies and potential considerations should be implemented by each student	X		x	X		X	x					

6. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason				
1	Presentation of the course in digital material.	Better access any time.				
2	Asking small groups to do assignments; each composed	Knowledge and skills transfer				
	of low, medium and high-performance students	among different levels of students.				
3	Electronic model system for the Institution.	E. learning.				

7. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Oral Examination	C3	a1, b1, c2
1		С9	d1
		C3	a1, b1, c2
2	Final work (presentation, Report)	C5	a1, c1, d1
Z		C7	d1, d3
		С9	d1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Oral Examination	at the end of training
2	Final work (presentation, Report)	4 th







7.3 Weighting of Evaluation:

No.	Evaluation Method	Weights
1	Oral Examination	50%
2	Final work (presentation, Report)	50%
	Total	100%

8. List of References:

No.	Reference List
1	Subject studies

9. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Lab.

10. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	The training aims to explore students' ability and		C3	a2, a3, c2
	skills to comprehensively address and manage	2,5	C5	b1
	architectural and technical issues.		C6	a1
2	A complete set of appropriately presented drawings,		C5	a1, c1, d1
	attributable studies and potential considerations		C7	d1, d2, d3
	should be implemented by each student.		C9	d1, d2

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022




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<u>Training (2)</u> (ENG530)

11. Basic Information

Program Title	Civil Engineering Program
Department Offering the Program	Civil Engineering Department
Department Responsible for the Course	Civil Engineering Department
Course Title	Training (2)
Course Code	ENG530
Year/Level	Level 5
Specialization	Major
Authorization Date of Course Specification	-
Pre- request	Complete Previous Level

Teaching hours	Lectures	Tutorial	Practical
reaching nours	-	-	42

12. Course Aims

No.	Aims
	Work in and manage a diverse team of professionals from various engineering disciplines,
2	taking responsibility for own and team performance; and behave professionally and adhere to
	engineering ethics and standards.
	Communicate effectively with a variety of audiences using a variety of forms, methods, and
5	languages; cope with academic and professional issues in a critical and creative manner; and
	display leadership, business administration, and entrepreneurial abilities.
	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and
7	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.
	Plan and manage construction processes; address construction defects, instability, and quality
8	issues; maintain safety measures in construction and materials; and assess environmental
	impacts of projects.

13. Competencies:

Competencies	Learning Outcomes (LO'S)
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.	 a1 Learn the general principles of design techniques specific to reinforced concrete and steel structures, foundations and earth retaining structures. a2 Understand the professional ethics and impacts of engineering solutions on society and environment. a3 Recognizes the various construction defects, instability and quality issues and assess environmental impacts of projects. b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.





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	c2 Applying engineering design procedures to generate
	cost-effective solutions while adhering to the principles and
	contexts of sustainable design and development.
C5 Utilize contemporary	a1 Define technical language and report writing.
technologies, codes of practice and	b1 Assess different ideas, views, and knowledge from a
standards, quality guidelines, health	range of sources.
and safety requirements,	c1 Prepare technical reports.
environmental issues, and risk	d1 Search for information to engage in lifelong self-
management principles.	learning discipline.
C6 Plan, supervise and monitor	al Show the appropriate and sustainable technologies for
implementation of engineering	construction of buildings, infrastructures, and water
projects, taking into consideration	structures.
other trades requirements.	c2 Acquire entrepreneurial skills.
C7 Function efficiently as an	d1 Collaborate effectively within multidisciplinary team.
individual and as a member of multi-	d2 Work in stressful environment and within constraints.
disciplinary and multicultural teams.	d3 Motivate individuals.
C9 Use creative, innovative, and	
flexible thinking and acquire	
entrepreneurial and leadership skills	d Think creatively in solving problems of design.
to anticipate and respond to new	u ² Effectively manage tasks, time, and resources.
situations.	

14. Course Contents:

No.	Topics	Tutorial	Practical
1	The training examines and measures students' knowledge, skills, and collective outputs gained throughout their study in the faculty and department in a combined manner, that reflects identity and creativity in all its preliminary and analytical phases.	-	37
2	Presentations will be emphasizing the technical contents.	-	5
	Total	-	42

15. Teaching and learning methods:

Topics	Face to face lecture	Online lecture	Flipped classroom	Presentation and movies	Discussion	Problem solving	Brain storming	Projects	Site visits	Self-learning and Research	Cooperative	Discovering	Modeling	Lab
The training aims to explore students' ability	X				X	x	X		X	X	X			





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and skills to comprehensively address and manage architectural and									
technical issues							 		
A complete set of appropriately presented drawings, accompanied by a detailed report of the training's attributable studies and potential considerations should be implemented by each student	X		x	X	X	X			

16. Teaching and learning methods for disabled students:

No.	Teaching Methods	Reason
1	Presentation of the course in digital material	Better access any time
2	Asking small groups to do assignments; each composed of low, medium, and high-performance students	Knowledge and skills transfer among different levels of students
3	Electronic model system for the Institution.	E. learning

17. Student Evaluation:

7.1 Student Evaluation method:

No.	Evaluation Method	Competencies	LO's
1	Oral Examination	C3	a1, b1, c2
1	Oral Examination	С9	d1
		C3	a1, b1, c2
2	Final marth (magantation Denant)	C5	a1, c1, d1
	rinal work (presentation, Report)	C7	d1, d3
		С9	d1

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks						
1	Oral Examination	at the end of training						
2	Final work (presentation, Report)	4 th						
7.3 W	.3 Weighting of Evaluation:							

No.	Evaluation Method	Weights
1	Oral Examination	50%
2	Final work (presentation, Report)	50%





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Total 100%

18. List of References:

No.	Reference List
1	Subject studies

19. Facilities required for teaching and learning:

No.	Facility
1	Lecture classroom
2	Seminar
3	White board
4	Lab.

20. Matrix of knowledge and skills of the course:

No	Торіс	Aims	Competencies	LO's
1	The training examines and measures students' knowledge, skills, and collective outputs gained throughout their study in the faculty and department in a combined manner, that reflects identity and creativity in all its preliminary and analytical phases.	2,5,7,8	C3 C5 C6 C9	a2, a3, c2 b1 a1 d1, d2
2	Presentations will be emphasizing the technical contents.	2,5	C5 C7	a1, c1, d1 d1, d2, d3

Course Coordinator: Prof. Dr. Mohamed Elkiki **Head of Department:** Prof. Dr. Mohamed Elkiki **Date of Approval:** 2022