Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	**Mathematics I**		**Code**	**FRB101**
Type	**Compulsory ☒**	**Elective ☐**		
Semester	**Fall Semester (First level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**2**	**0**	**3**

2. Professional Information:

2.1. Course description:

Calculus of integration and differentiation: Functions, limits and continuity, algebraic and periodic functions, calculating differentials, inverse functions, parametric forms, libenz theory, Maclaurin's and Taylor's expansions, the mean value of curvature theory, inverse differentials. Linear algebra: matrices, algebraic operations on matrices, hermetian and orthogonal matrices, ordinary operations, ordinary matrices, equivalence of matrices, graded matrix, systems of linear equations, rank of a matrix, eigenvalues and cayley-hamilton theory, linear spaces, binomial theory, partial fractions.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Illustrate** the elements of mathematical logic, relations, mappings, real functions and their graphs applications of differentiation, and its applications.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles	**CO2**	**Select** a suitable item to evaluate applied engineering problems adhering to engineering ethics and standards.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	**Discuss** the basic principles of the course.
			CLO2	**Discuss** how to use all topics of the course in solving the applied engineering problems
A2	PLO2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	CLO3	**Evaluate** the suitable solution methods for various linear algebra problems
			CLO4	**Analyze** the different problems and its verifications in integration and differentiation and linear algebra

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction	1	√	√		
Functions, Limits And Continuity,	2	√	√		
Algebraic And Periodic Functions,	3		√		√
Calculating Differentials, Inverse Functions, Parametric Forms, Libenz Theory,	4	√			
Maclaurin's And Taylor's Expansions, The Mean Value Of Curvature Theory, Inverse Differentials	5,6	√	√		√
First Exam	7	√	√		√
Matrices, Algebraic Operations On Matrices,	8	√	√		
Hermetian And Orthogonal Matrices, Ordinary Operations	9	√		√	√
Systems Of Linear Equations, Rank Of A Matrix, Eigenvalues And Cayley-Hamilton Theory	10	√			√
Ordinary Matrices, Equivalence Of Matrices, Graded Matrix,	11		√	√	
Second Exam	12	√	√	√	√

Linear Spaces, Binomial Theory, Partial Fractions.	13-15	√	√	√	
Final Exam	16	√	√	√	√
Total	**16**	**12**	**10**	**5**	**5**

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture	√	√		
2. Tutorials	√	√		
3. Problem-based Learning		√		
4. Discussion			√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	**First Exam**	√	√		√
	Second Exam		√	√	√
Discussion		√	√	√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		**Week**	**The weighting of Assessment %**
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
Discussion		3,6,9,11	10 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	https://www.math.hkust.edu.hk/~machas/
Essential Books (Textbooks):	1. Introductory Mathematics for Engineering Applications by Kuldip S. Rattan , Nathan W. Klingbeil , Wiley; 1 edition, 2014. 2. Applied Engineering Analysis, Tai-Ran Hsu, published by John Wiley & Sons, 2018 (ISBN 97811119071204)
Periodicals, Web Sites, … etc:	1. **https://byjus.com/maths/** 2. **https://ncert.nic.in/ebooks.php?ln=**

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	**Course Objective**	
	CO1	CO2
PO1	√	
PO2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	**Course Learning Outcomes**			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	**Program Learning Outcomes**	**Course Learning Outcomes**			
		CLO1	CLO2	CLO3	CLO4
A1	PLO1	√	√		
A2	PLO2			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Lecture • Tutorials	• First and Final Exams
			CLO2	• Lecture • Tutorials	• First, Second and Final Exams
				• Problem-based Learning	• Discussion
A2	PLO2	PO2	CLO 3	• Discussion	• Second and Final Exams
					• Discussion
			CLO4	• Discussion	• First, Second and Final Exams

Course Coordinator: Dr.wageda Ibrahim

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Mathematics II		**Code**	FRB102
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (First Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	2	3

2. Professional Information:

Pr. Req. : Mathematics I (FRB101)

2.1. Course description:

Calculus of integration and differentiation: Methods of integration, applications of definite integration (areas, volumes, circular surfaces, length of curvature, central points) first order ordinary differential equations, introduction to probability theory: sample space, probability axioms, some basic theories, counting methods, conditional probability, random variables, mathematical expectation, some discrete and continuous distributions, Analytical geometry: shifting and rotating of axes, conic sections, and their specifications: parabola, ellipse, hyperbola. Introduction to MATLAB.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Explain** a philosophy of integration Analytical geometry, probability theory, and its applications.
		CO2	**Select** a suitable item to evaluate applied engineering problems.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	**PLO1**	Identify, formulate, and solve complex engineering problems by applying	**CLO2**	**Explain** how to use all items of the course in applied engineering problems

		engineering fundamentals, basic science, and mathematics.	**CLO3**	**Evaluate** the suitable solution methods for various mathematics elements
A2	**PLO2**	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**CLO1**	**Identify** the basic items of the course.
			CLO4	**Analyze** the different problems and verifications

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	**CLO3,4**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Methods of integration	**1,2**	√	√		
Applications of definite integration (Areas, volumes, circular surfaces, length of curvature, central points)	**3-5**	√	√		
First order, Ordinary differential equations,	**6**		√		√
First exam	**7**	√	√		√
Introduction to MATLAB	**8**	√			√
Sample space, probability, Axioms, some basic theories,	**9**			√	
Counting methods, conditional probability, random variables, Mathematical expectation,	**10**	√			√
Some discrete and continuous distributions	**11**	√			√
Second exam	**12**	√		√	√
Analytical geometry: Shifting and rotating of axes,	**13,14**		√	√	
Conic sections and their specifications: parabola, ellipse, hyperbola	**15**	√			√
Final Exam	**16**	√	√	√	√
Total	**16**	**9**	**8**	**2**	**5**

2.6. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to MATLAB	8	√			√
Counting methods, conditional probability, random variables, Mathematical expectation,	10-11	√			√
Some discrete and continuous distributions	13-14	√			√
Conic sections and their specifications: parabola, ellipse, hyperbola	15	√			√
Total	**6**	**6**			**6**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture		√	√	
2. Tutorials		√	√	
3. Computer-based Instruction	√			√
4.Discussion	√			√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**	√	√		√
	Second Exam	√		√	√
Assignment		√	√	√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
Assignment		3,6,9,11	10 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	Lecture notes
Essential Books (Textbooks):	1. Science and Engineering Mathematics with the HP 49 G - Volume II - Calculus, differential equations, statistics by Gilberto Urroz BookSurge Publishing, 2014. 2. Applied Engineering Analysis, Tai-Ran Hsu, published by John Wiley & Sons, **2018** (ISBN 97811119071204)
Periodicals, Web Sites, … etc:	**1. https://byjus.com** **2. https://ncert.nic.in**

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Laboratory Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A1	PLO1		√	√	
A2	PLO2	√			√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Discussion • Computer-based Instruction	• First ,Second and Final Exam • Assignment
			CLO2	• Lecture • Tutorials	• First , Second and Final Exams • Assignment
A2	PLO2		CLO 3	• Lecture	• Second and Final Exam
				• Tutorials	• Assignment
			CLO4	• Discussion	• First , Second and Final Exam
				• Computer-based Instruction	• Assignment

Course Coordinator: **Ass Prof. Mohamed Abdel Fattah Elsisy**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	**Mechanics 1**		**Code**	**FRB 103**
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (First Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	---	3

2. Professional Information:

2.1. Course description:

Vector algebra, additions and products of vectors, analytical and geometrical solutions for: reduction of different systems of forces (intersecting or non intersecting) in two dimensions, forces in space, operations of force analysis in two dimensions, equivalence of force systems, body equilibrium, equilibrium in two dimensions, equilibrium in three dimensions rigid bodies, equilibrium of ideal systems: groups of bodies, groups of rigid bodies and its applications friction, coefficient and angle of friction, volplane, loop, applications on the real mechanical systems.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real life situation.	**CO1**	**Describe** and formulate the mathematics equilibrium conditions of rest for rigid bodies under the action of various loads.
		CO2	**Illustrate** The principles of mechanics as a science and thus lay foundations to the solution of practical problems for engineering applications.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	CLO1	The student will be able to **differentiate** between a particle and a rigid body
			CLO2	The student will be able to **describe** the statically equilibrium conditions of a particle .
A2	PLO2	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	CLO3	The student will be able to **determine** the statically equilibrium conditions of a rigid body.
			CLO4	The student will be able to **discuss** the friction.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,4	**CLO1,3**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
General Principles	1,2	√			
Analysis of Structures	3-5	√	√		
Static of Particle in space	6		√		
First exam	**7**	√	√		
Rigid bodies: Equivalent force couple system	8-9	√	√		
Static of Rigid body in space	10-11			√	
Second exam	**12**	√	√	√	
Friction	13				√
Applications	14-15				√
Final Exam	**16**	√	√	√	√
Total	**16**	**7**	**6**	**2**	**3**

2.6. Lab Topics:

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1. Lectures	√	√		
2. Tutorials		√		
3. Problem-based Learning	√			
4. Discussion			√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	First Exam	√	√		
	Second Exam	√	√	√	
	Quizzes		√	√	
Assignments		√	√		
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1 Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
	Quizzes	2-6,8-11	5 %
Assignment		After each topic	5 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Vector Mechanics for Engineers: Statics, Twelfth Edition Ferdinand p. Beer, E. Russell Johnston
Recommended Books:	Engineering Mechanics , statics- Hibbeler,2009, ISBN: 0138149291
Web Sites	https://mffeci.ekb.eg/linkresolver/openurl/v0.1 Egyptian Knowledge Bank

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
White Board
Data Show

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2.
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2.			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A1	PLO1	√	√		
A2	PLO2			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	Lectures	• First , Second and Final Exams
				Problem-based Learning	• Assignments
			CLO2	Lectures	• First , Second and Final Exams
				Tutorials	• Quizzes • Assignments
A2	PLO2		CLO3	Discussion	• Second and Final Exams
			CLO4	Discussion	• Final Exam
					• Quizzes

Course Coordinator: Dr. Naser Eldin Ab Elsttar

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	**Mechanics II**		**Code**	**FRB 104**
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**Spring Semester (**First Year**)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**2**	**-**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Mechanics I (FRB103)

Kinematics of bodies, motion analysis in one dimension, body kinematics and motion analysis in two dimensions in Cartesian and intrinsic forms, some engineering applications in kinematics, : relation between force and acceleration, static integration of motion (relation between energy and work), time integration of motion (relation between impulse and momentum) engineering applications : motion of body in one dimension in a conservative or non conservative fields. Motion of bodies under ideal wraps, orthogonal and inclined impact, motion of vibrating bodies, other engineering applications.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real life situation.	**CO1**	**Formulate** the mathematical geometry and the equilibrium conditions of motion for a particle and under the action of various loads.
		CO2	**Illustrate** The principles of dynamics as a science and thus apply foundations to the solution of practical problems for engineering applications.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	**PLO1**	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science,	**CLO1**	Describe the particle motion along different trajectory using different coordinate systems.

		and mathematics	**CLO2**	Explain the motion of vibrating body.
			CLO3	Describe the equilibrium conditions of motion for a particle using Newton's Second Law, the principle of conservation of energy and the principle of conservation of linear momentum.
			CLO4	Apply the equilibrium conditions of motion for a particle using Newton's Second Law, the principle of conservation of energy and the principle of conservation of linear momentum.
			CLO5	The student will be able to **apply** the equilibrium conditions for the vibrating body.
A2	**PLO2**	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	**CLO6**	Analyze the particle motion of velocity and acceleration using a dynamical reference.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2,3	**CLO4,5,6**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
General Principles	1	√	√				
Kinematics of particles (Rectilinear motion)	2	√					
Kinematics of particles (motion of projectiles in a curvilinear motion)	3	√					
Kinematics of particles	4	√					

(components of velocity and acceleration in a curvilinear motion)							
Kinetics of particles (Newton's second law)	5	√		√	√		
Kinetics of particles (Principle of work and energy)	6	√		√	√		
First Exam	7	√					
Kinetics of particles (Principle of work and energy)	8-9	√		√	√	√	
Kinetics of particles (Principle of impulse and momentum)	10-11	√		√	√		
Second Exam	12			√	√		
Motion of vibrating bodies	13,14						√
Other engineering application	15		√	√	√	√	
Final Exam	16	√		√	√	√	
Total	**16**	**10**	**3**	**7**	**7**	**3**	**2**

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1. Lectures	√	√	√	√	√	
2. Tutorials	√			√		
3. Discussion						√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	First, Second Exam	√		√	√		
	Quizzes	√		√			√
Assignments		√	√	√	√		
Summative Assessment Method							
Final Exam		√		√	√	√	

2.7.1 Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Formative Assessment Method			
Tests	First Exam	7	30
	Second Exam	12	20
	Quizzes	**6, 13**	3
Assignments		**5-6,9-11,13-14**	7
Summative Assessment Method			
Final Exam		16	40
Total			**100**

2.8. List of Reference:

Essential Books:	Vector Mechanics for Engineers: Dynamics, Twelfth EditionFerdinand p. Beer, E. Russell Johnston, 2019
Recommended Books:	Engineering Mechanics , Dynamics, Fourteenth Edition- Hibbeler, 2018

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
White Board
Data Show

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2.
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
CO1	√	√	√		√	
CO2				√		√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A1	PLO1	√	√		√	√	√
A2	PLO2			√			

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	Lectures Tutorials	• First , Second and Final Exams • Quizzes • Assignments
			CLO2	Lectures	• Assignments
A2	PLO2		CLO3	Lectures Tutorials	• Second and Final Exams • Quizzes • Assignments
A1	PLO1		CLO4	Lectures	• Second and Final Exams • Assignments
			CLO5	Lectures	• Final Exam
			CLO6	Discussion	• Quizzes

Course Coordinator: Dr. Ahmed El-Desouky

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	General Chemistry		**Code**	**FRB 105**
Type	**Compulsory ☒**	**Elective ☐**		
Semester	**Fall Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	1	**3**

2. Professional Information:

2.1. Course description:

Systematic treatment of fundamental of chemical principles and their applications. The gaseous state, liquid state, cement, electrochemistry, metallic corrosion, metallic elements, solution and colloids. The concept of energy and its uses, gas laws, ideal and real gases, kinetic molecular theory, atomic and molecular structure, chemical bonding. Introduction to the principles of chemical equilibrium and to ionic solutions, chemical kinetics, acids and bases

2.2. Course **Objectives (CO):**

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Demonstrate** knowledge of laboratory safety and To generalize the analytical and quantitative skills gained and to apply them in more advanced courses.
		CO2	**Apply** the scope, methodology, and application of modern chemistry and learn principles of molecular theory, stoichiometry, and thermodynamics to solve chemical problems in real-life situations.
		CO3	**Classify** matter by its state and bonding behavior and explain the qualitative and quantitative relationships between matter and energy involved in chemical or physical processes.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	CLO1	**Distinguish** between acids and bases.
			CLO2	**Explain** the gas laws and differentiate between ideal and real gas behavior.
			CLO3	**Describe** the intermolecular forces and their effect on liquid properties and phase diagram of a matter.
			CLO4	**Recognize** types of solutions and their colligative properties
			CLO5	**Describe** bonding that can be applied to a consideration of the properties of solids.
A2	PLO2	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.	CLO6	**Demonstrate** laboratory experiments with safe and proper use of glassware, record and interpret data obtained.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2,3,4,5	**CLO6**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Acids and bases	1-4	√					
Gaseous state	5-6		√				
First Exam	7	√	√				
Liquids and solutions	8-11			√	√		
Second Exam	12		√	√	√		
Liquids and solutions	13			√	√		
Solids	14-15					√	
Final Exam	16	√	√	√	√	√	
Total	**16**	**4**	**2**	**4**	**4**	**2**	

2.6. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO6	CLO2	CLO3	CLO4
Introduction to lab. safety rules	1	√			
Introduction to lab. glassware	2	√			
Chemical handling	3	√			
Experiment 1: volumetric determination of NaOH using a standard HCl	4	√			
Experiment 2: volumetric determination of HCl using a standard NaOH solution	5	√			
Experiment 3: determination of the carbonate content of a soda ash sample	6	√			
Experiment 4: determination of a mixture of carbonate and bicarbonate content of a soda ash sample	7	√			
Experiment 5: determination of chloride ion concentration	8	√			
Oral & Experimental Test	14	√			
Total	**9**	**8**			

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lecture	√	√	√	√	√	
2. Tutorials	√		√	√	√	
3. Practical-based Learning						√
4. Problem-based Learning		√	√	√	√	
5. Interactive learning						√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	First Exam	√	√				
	Second Exam		√	√	√		
	Experimental						√
Observations			√	√	√	√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Formative Assessment Method			
Tests	First Mid-Term	7	30
	Second Mid-Term	12	10
	Experimental	14	10
Observations		3-8	10
Summative Assessment Method			
Final Exam		16	40
Total			**100**

2.9. List of Reference:

Course Notes:	Elsayed Fouad, Textbook Engineering Chemistry
Essential Books (Textbooks):	Jeffrey Gaffney, Nancy Marley, General Chemistry for Engineers 1st Edition, Elsevier; 1st edition (November 27, 2017)
Recommended Books:	Ralph Petrucci, Jeffry Madura, F. Herring, Carey Bissonnette; General Chemistry: Principles and Modern Applications 11th Edition, Pearson; 11th edition (2016)
Periodicals, Web Sites, … etc:	**https://mffeci.ekb.eg/linkresolver/openurl/v0.1**

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Laboratory Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO1	√	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1			√			√
CO2	√			√		
CO3		√			√	

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A1	PLO1	√	√	√	√	√	
A2	PLO2						√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Lecture • Tutorials	First and Final Exams
			CLO2	• Lecture • Problem-based Learning	First ,Second and Final Exams Observation
			CLO 3	• Lecture • Tutorials • Problem-based Learning	Second and Final Exams Observation
			CLO4	• Lecture • Tutorials • Problem-based Learning	Second and Final Exams Observation
			CLO5	• Lecture • Tutorials • Problem-based Learning	Final Exam Observation
A2	PLO2		CLO6	• Practical-based Learning • Interactive learning	Oral and Experimental Tests Observation

Course Coordinator: Prof. Elsayed Fouad

Program Coordinator: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Physics 1		**Code**	FRB107
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (First Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	2	3

2. Professional Information:

2.1. Course description:

Properties of matter: standard units, dimensional analysis, moment of inertia, angular motion (displacement, velocity, acceleration, work and power, momentum, and relation with linear motion), moments of inertia, stress, strain, modulus of elasticity, hook's law, fluid statics: continuity equation, Bernoulli's equation, viscosity, stock's equation, Newton's law, surface tension, capillarity phenomenon, Thermodynamics: properties (internal energy, temperature, specific heat, phase change, latent heat), heat transfer (conduction convection and radiation), first law of thermodynamics, thermo dynamics of ideal gases, Transitional operations: molecular diffusion on gases, heat conduction energy, viscosity, first and second fik's laws, steady state .

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Apply** wide sets of surveying knowledge in engineering physics to identify and solve engineering problems with innovative solutions.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	**Perform** simple lab experiments on different concepts of physics and extract information from the collected data.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO1	**Identify** the basic physical quantities and dimensional analysis with emphasis on the validation of basic physical relations and how to deduce basic physical relations, the elasticity of materials, and fluid dynamics.
			CLO2	**Explain** different theories of thermodynamics.
			CLO3	**Solve** different problems on first law of thermodynamics, heat, kinetic theory, specific heat and second law of thermodynamics.
A2	PLO2	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.	CLO4	Practically **examine** different physical concepts such as rotational motion, surface tension, and viscosity in the lab.
			CLO5	Effectively **use** basic instruments to perform thermodynamics experiments.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4,5	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Properties of matter, standard units, and dimensional analysis	1, 2	√				
Angular motion	3	√				
Elasticity	4, 5	√				

Surface tension and Fluid dynamics	6	√				
First Exam	7	√				
Surface tension and Fluid dynamics	8	√				
1st Law of thermodynamics	9		√	√		
Thermodynamics of Ideal Gases	10, 11		√	√		
Second Exam	12	√	√	√		
2nd Law of thermodynamics	13, 14		√	√		
Heat Transfer	15		√	√		
Final Exam	16	√	√	√		
Total		**7**	**6**	**6**		

2.6. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Simple Pendulum	3				√	
Surface Tension	6				√	
Viscosity	7				√	
Specific Heat	9					√
Temperature coefficient of Thermistor	11					√
Oral & Experimental Test	15				√	√
Total					**3**	**2**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lectures	√	√	√		
2. Tutorial	√	√	√		
3. Practical-based Learning				√	√
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					√
2. Extra Lectures					√
3. Provide different levels of books and materials					√

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method						
Tests	**Oral Test**				√	√
	First Exam	√				
	Second Exam	√	√	√		
	Experimental				√	√
Summative Assessment Method						
Final Exam		√	√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Methods		Week	Weighting of Asses%
Formative Assessment Method			
Tests	**First Exam**	7	**30**
	Second Exam	12	**10**
	Oral Test	15	**10**
	Experimental	15	**10**
Summative Assessment Method			
Final Exam		16	**40**
Total			**100**

2.9. List of References:

Course Notes:	Lecture Notes
Essential Books (Textbooks):	Serway & Jewett - Physics for Scientists and Engineers with Modern Physics 9th. Ed., 2014.
Recommended Books:	-Physics for Scientists and Engineers, Vol. 1, 6th, Paul A. Tipler, Gene Mosca, 2007. - Fundamentals of Physics Extended 10th. Ed., 2014.
Web Sites	**https://mffeci.ekb.eg/linkresolver/openurl/v0.1** Egyptian Knowledge Bank

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Laboratory Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√	√	√		
CO2				√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A1	PLO1	√	√	√		
A2	PLO2				√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Lecture • Tutorial	• First, Second and Final exams
			CLO2	• Lecture • Tutorial	• First, Second and Final exams
			CLO3	• Lecture • Tutorial	• Second and Final exams
A2	PLO1	PO5	CLO4	• Practical-based Learning	• Oral Test • Experimental Test
			CLO5	• Practical-based Learning	• Oral Test • Experimental Test

Course Coordinator: Dr. Ibrahim Sayed Ahmed Ibrahim

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	**Physics 2**		**Code**	FRB108
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**Spring Semester (First Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**2**	**2**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Physics I (FRB107)

Electricity: electric charge, conductors and insulators, coulomb's law, electric field, electric dipole, electric flux, Gauss law, Electrical potential energy and potential difference, breakdown under high voltage, capacitors, energy stored in charged capacitors, electrical insulating materials, temperature dependence of resistivity. Magnetism: permanent and electric magnetic fields, magnetic force, torque on a coil, biot–savart law, Ampere's law, Maxwell's equations, electromagnetic spectrum, Optics: reflection refraction, Snell's law, format principle, total internal reflection, fiber optics, thin lenses, magnification, focal length of thin lenses, defects of images, spherical diffraction and color diffraction.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Apply** wide sets of surveying knowledge in engineering physics to identify and solve engineering problems.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	**Perform** simple lab experiments on different concepts of physics and extract information from the collected data.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO1	**Explain** electric force, electric field, Gauss's law, electric potential and electric potential energy.
			CLO2	**Calculate** the capacitance of a capacitor, the resistance of a resistor by satisfying Ohm's law and the effect of temperature on the resistance of a resistor.
			CLO3	**Discuss** the different theories of magnetism by showing the effect of magnetic field on moving charges, current carrying wire and coils.
			CLO4	**Discuss** Ampere's law, Maxwell's equations and electromagnetic spectrum.
			CLO5	**Identify** the different properties of light and the fiber optics and its applications in real life.
A2	PLO2	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.	CLO6	Practically **examine** different physical concepts of electricity in the lab.
			CLO7	Effectively **use** basic instruments to perform magnetism experiments.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,3,4,5	CLO2,6,7	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered						
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
Electric field	1	√						
Gauss's law	2	√						
Electric potential	3	√						
Capacitance	4, 5		√					
Electrical current and resistance	6		√					
First Exam	7	√	√					
Magnetic field	8			√				
Sources of magnetic field	9				√			
Faraday's law	10				√			
Induction	11				√			
Second Exam	12			√				
Maxwell's equations	13				√			
Optics	14, 15					√		
Final Exam	16	√	√	√	√	√		
Total		**3**	**2**	**1**	**4**	**1**		

2.6. Lab Topics:

Lab Topics	Week	Course LO's Covered						
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
Resistors Combinations and Ohm's Law	2						√	
Kirchhoff's Laws	4						√	
Wheatstone bridge & Metric bridge	6						√	
Electric Field Mapping	8						√	
Capacitor Charging	10						√	
Capacitor Discharging	11						√	
Electric Transformer	12							√
Faraday's Law	13							√
Final Lab Exam	15						√	√
Total							**6**	**2**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered						
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
1. Lectures	√	√	√	√	√		
2. Tutorial	√	√	√	√	√		
3. Practical-based Learning						√	√
Teaching and Learning Methods for Students with Special Needs:							
Methods							
1. Discussion Session						√	
2. Extra Lectures						√	
3. Provide different levels of books and materials						√	

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered						
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
Formative Assessment Method								
Tests	**Oral Test**						√	√
	First Exam	√	√					
	Second Exam			√				
	Experimental						√	√
Summative Assessment Method								
Final Exam		√	√	√	√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Methods		Week	Weighting of Asses.
Formative Assessment Method			
Tests	**First Exam**	7	**30**
	Second Exam	12	**10**
	Oral Test	15	**10**
	Experimental	15	**10**
Summative Assessment Method			
Final Exam		16	**40**
Total			**100**

2.9. List of Reference:

Course Notes:	Lecture Notes
Essential Books (Textbooks):	Serway & Jewett - Physics for Scientists and Engineers with Modern Physics 9th. Ed., 2014. Physics for Scientists and Engineers: A Strategic, by Randall D. Knight, Pearson; 4th edition, 2016.
Recommended Books:	- Physics for Scientists and Engineers, Vol. 1, 6th, Paul A. Tipler, Gene Mosca, 2007. - Fundamentals of Physics Extended 10th. Ed., 2014.

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Laboratory Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes						
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
CO1	√	√	√	√	√		
CO2						√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes						
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
A1	PLO1	√	√	√	√	√		
A2	PLO2						√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Lecture • Tutorial	• First and Final exams
			CLO2	• Lecture • Tutorial	• First and Final exams
			CLO3	• Lecture • Tutorial	• Second and Final exams
			CLO4	• Lecture • Tutorial	• Final exam
			CLO5	• Lecture • Tutorial	• Final exam
A2	PLO2	PO5	CLO6	• Practical-based Learning	• Oral Test • Experimental
			CLO7	• Practical-based Learning	• Oral Test • Experimental

Course Coordinator: Dr. Ibrahim Sayed Ahmed Ibrahim

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Computer Programming		**Code**	FRE110
Type	**Compulsory** ☒		**Elective** ☐	
Semester	Spring Semester (First Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	0	3	3

2. Professional Information:

2.1. Course Description:

Historical introduction, computer classification, computer and society, data representation, number systems, computer components (console outside and inside including processors, memory, hard disk, cards, and cables – Monitor, keyboard, mouse, floppy drive, CD ROM, printers, modems, scanners), operating systems (history, managing files, and directories, important topics in Windows), programming, flowcharts, structured programming, algorithms for engineering applications, and high-level languages. Laboratory: practical experience using operating systems and application programs.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	**Apply** a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and **solve** engineering problems in real-life situations.	**CO1**	**Apply** fundamental programming skills and general programming concepts.

2.3. Course Learning Outcomes (CLOs):

S.C	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO1	**Identify** the digital world, networks, and the developments in computer hardware and software from the first generation to the present.
			CLO2	**Explain the** data representation and work with different number systems.
A2	PLO2	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.	CLO3	**Use** algorithms, flowcharts, and pseudo code to solve engineering problems.
			CLO4	**Apply** a computer software to solve problems using flowcharts and a specific programming language.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
1.Historical introduction, computer classification, Computer Networks and the Internet, computer and society	1,2	√			
2.Data representation, and number systems	3	√	√		
3.Computer components	4,5	√	√		
4.Present the computer software basics and operating systems.	6	√	√		
5.First exam	7	√	√		
6.Algorithms, and flowcharts	8,9			√	√
7.Introduction to computer programming languages	10			√	√
8.High-level languages	11			√	√
9.Second exam	12	√		√	
10. High-level languages	13			√	√
11. High-level languages	14			√	√
12. High-level languages	15			√	√
13. Final exam	16	√	√	√	√
Total	**16**	**6**	**4**	**7**	**7**

2.6. Lab Topics:

Lap Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to the world of computers.	2,3	√			
Introduce the computer system hardware.	4,5	√	√		
Present the computer software basics and operating systems.	6,7	√	√		
Introduction to computer programming languages.	8:14			√	√
Total	**13**	**6**	**4**	**7**	**7**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√		
2. Computer-based Instruction			√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course Los Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	First Exam	√	√		
	Second Exam	√		√	
	Experimental				√
Summative Assessment Method					
Practical Exam				√	√
Final Exam		√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
	Experimental	12	10%
Summative Assessment Method			
Practical Exam		16	20 %
Final Exam		16	20%
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	• Deborah Morley and Charles S. Parker, "Understanding Computers: Today and Tomorrow", Comprehensive Cengage Learning; 16th Edition 2017. • David I. Schneider, "Introduction to Programming Using Python", Pearson Education Limited, 1st Edition 2016.
Recommended Books:	• Joseph Connor, "computer programming for beginners- Learn the Basic of Java, SQL & C++", 4th Edition (17Aug. 2015)

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Laboratory Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives
	CO1
PO1	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	**CLO2**	**CLO3**	**CLO4**
CO1	√	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

S.C	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A1	PLO1	√	√		
A2	PLO2			√	√

3.4. Assessment Alignment Matrix

S.C	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Lecture	• First, Second and Final Exams
			CLO2	• Lecture	• First, and Final Exams
A2	PLO2		CLO3	• Computer-based Instruction	• Second and Final Exams
			CLO4	• Computer-based Instruction	• Experimental test • Practical Exam

Course Coordinator: Dr. Hossam Labib Zayed

Head of Department: Dr. Ahmad Youssef Kamal El Din Mohamed

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management Program			
Department Offering the course	Construction Engineering and Management Program			
Date of Specification Approval	**5/9/2023**			
Course Title	Production Engineering		**Code**	FRM 106
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**Spring Semester (First Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**-**	**3**	**3**

2. Professional Information:

2.1. Course description:

Introduction, Types of industries, Casting processes: Main steps of sand casting, Pattern design, Melting of metals, Cleaning and inspection of casting, Metal forming processes: Forging, Rolling, Extrusion, Drawing, Bending, Joining Processes: Temporary and permanent joints, Welding techniques, Cutting Processes: Principles and elements of cutting processes, Basic cutting and machining (Turning, Drilling, Milling, …), Engineering Materials, Measurements, Introduction to management and industrial systems, Production techniques, Factory planning, Principles of production planning and control, Introduction to quality control.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Apply different branches of production engineering ,i.e Manufacturing Technology, Industrial Engineering and Quality Control
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO2**	Apply of particular materials for specific design requirements
		CO3	Evaluate basic manufacturing processes and select the appropriate process to produce various products

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A4	PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	CLO1	Use the knowledge about workshop's equipment and hand tools of different manufacturing processes, and the necessary safety considerations.
			CLO2	**Classify** the different manufacturing processes definitions, concepts, formulae, characteristics, and capabilities.
			CLO3	Use of principles and concepts to suggest appropriate solutions for engineering problems based on analytical thinking.
A6	PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO4	Illustrate skills to carryout measurement tests using the measuring tools and hand tools and workshop equipment.
			CLO5	**Apply** the experience and hands skills on different trades of engineering like fitting, carpentry, machining, welding, and sheet metal.
			CLO6	Examine the appropriate techniques, skills, and modern engineering tools necessary for engineering practice.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO4	CLO1,2,3,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction and classification , Industrial Engineering (The role of production engineer , production system , Production types, Types of industries)	1	√	√		√		
Industrial Engineering (Factory planning , Production planning and control , Organization for production , Manufacturing costs	2			√		√	
Engineering materials (Composition Structure Properties Production and Applications)	3	√		√			
Quality Control (Specifications and Standards, Dimensioning, Tolerances and fits, Metrology	4				√	√	√
Casting technology	5	√			√		
Powder metallurgy	6		√			√	
First Exam	7	√	√				√
Metal forming technology and Plastic processing	8		√		√		
Joining technology	9-10			√			√
Metal removal technology , Turning, drilling, milling, shaping and planning, broaching, sawing, grinding	11	√		√			
Second Exam	12		√	√			
Turning technology, machining parameters, machining time, cutting tools, tool life	13		√		√		
Non – conventional manufacturing processes	14,15			√		√	√
Final Exam	16	√	√		√	√	√
Total	**16**						

2.6. Lab Topics:

Lab Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Carpentry workshop	1-3	√				√	√
Foundry workshop	4-6	√				√	√
plumbing workshop	7-9	√				√	√
lathe workshop	10-12	√				√	√
Total	**12**						

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lectures and slides	√	√	√	√		√
2. Project-based Learning	√	√	√	√		√
3. Problem-based learning		√		√		
4.Practical – based -Learning	√				√	√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Brain storming						
2. Presentation on case study						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	First Exam	√	√				√
	Second Exam		√	√			
	Oral test	√		√		√	√
Discussion		√		√	√		
Summative Assessment Method							
Final Exam		√	√		√		√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Methods		Week	Weighting of Asses%
Formative Assessment Method			
Tests	**First Exam**	7	**30**
	Second Exam	12	**10**
	Oral Test	15	**10**
Discussion		**8,13**	**10**
Summative Assessment Method			
Final Exam		16	**40**
Total			**100**

2.9. List of References:

Essential Books (Textbooks):	Galyer, JFC and Shotbolt , CR 1990, Metrology for engineers, 5th edn, Cassell, London
Recommended Books:	ManProduction Systems Engineering by Jingshan Li , Semyon M. Meerkov Springer; 1st ed. 2009 edition, 2008.
Periodicals, Web Sites, … etc:	Social media: www.youtube.com Free Books Download: search.4shared.com/search.html

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Laboratory Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO1	√		
PO4		√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√				√	
CO2		√	√			
CO3				√		√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A4	PLO4	√	√	√			
A6	PLO6				√	√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO4	PO1	CLO1	Lectures	First , and Final Exams
				Project-based Learning	Oral test
				Practical – based - Learning	
			CLO2	Lectures	First , Second and Final Exams
				Project-based Learning	Discussion
				Problem – based - Learning	
			CLO3	Lectures	Second Exam
				Project-based Learning	Oral test
A6	PLO6	PO2	CLO4	Lectures	Final Exam
				Problem-based learning	Discussion
				Project-based Learning	
			CLO5	Practical – based - Learning	Oral test
			CLO6	Lectures	First , and Final Exam
				Project-based learning	Oral test
				Practical – based - Learning	

Course Coordinator: Prof Saleh Kaytbay

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Engineering Graphics		**Code**	FRM109
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (First Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	5	0	4

2. Professional Information:

2.1. Course description:

Engineering drawing techniques and skills. Drawing instruments and their uses, lettering and dimensioning. Geometrical constructions, conic sections and special curves (Involutes, Cycloid, Archimedean, Spiral, Helix). Theory of view derivation. Orthographic projection of engineering bodies. Theory of projection with applications in machine drawing (solid section, beam sections), Isometric and oblique projections. Sectional views. Intersection and development of engineering surfaces. Introduction to steel structural drawing, Symbols of electrical circuits

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO1**	Use to the important tools for engineering drawing. This will give student basic knowledge of technical drawings professions and means of communications to others.
		CO2	Imagine and ability of student's to represent the shape size and specifications of physical objects.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools	**CO3**	Draw or design a 3D object on 2D paper including all manufacturing constraints by hand sketching method

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A6	PLO6.	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO1	Draw of the shapes, angels and lines and others which is essential for engineer
			CLO2	Apply the principle of projection and sectioning
			CLO3	Draw of three-dimension objects on the paper and to draw the Pictorial drawings
			CLO4	Draw of the intersection and development of different types of surfaces.
			CLO5	Draw of the steel structural
			CLO6	Draw of electrical circuits Symbols
A8	PLO8.	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO7	Apply the main idea of using dimension for engineering drawing
			CLO8	Use different drawing equipment, technical standards and procedures for construction of geometric figures.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4,5,6,7,8	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Engineering drawing techniques and skills. Drawing instruments and their uses, lettering and dimensioning	1	√						√	√
Geometrical constructions, conic sections and special curves	2	√			√			√	√
Theory of view derivation, Orthographic projection of engineering bodies.	3,4		√		√				√

Theory of projection with applications in machine drawing	5		√		√				√
Isometric and oblique projections	6		√						√
First Exam	**7**	√	√		√			√	√
Sectional views, Intersection and development of engineering surfaces..	8,10			√					√
Electrical circuits Symbols	11						√		√
Second Exam	12			√	√			√	√
Electrical circuits Symbols	13						√		√
Steel structural drawing	14-15					√			√
Final Exam	16	√	√	√		√		√	√
Total	16	**2**	**4**	**3**	**4**	**2**	**2**	**2**	**13**

2.6. Lab Topics:

N.A

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**							
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
1. Lectures	√	√				√	√	√
2. Discussions			√	√	√			
3. Tutorials.	√	√				√	√	√
Teaching and Learning Methods for Students with Special Needs:								
Methods								
1. Discussion Session								
2. Extra Lectures								
3. Provide different levels of books and materials								

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Formative Assessment Method									
Tests	First Exam	√	√		√			√	√
	Second Exam			√	√			√	√
	Quizzes (C.W)	√	√				√	√	√
Assignments (H.W)		√	√				√	√	√
Discussion				√	√	√			
Summative Assessment Method									
Final Exam		√	√	√		√		√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
	Quizzes (C.W)	1-6,8-11,13-14	5 %
Assignments (H.W)		Every Week	3 %
Discussion		2-5,8-11	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	Lectures and presentations
Essential Books (Textbooks):	K. Rathnam, Course in Engineering Drawing, 2018
	A Textbook of Engineering Drawing: for Undergraduate Engineering Students- Addisu Dagne Zegeye-2020- ASIN : B08BCS3KQW
Recommended Books:	A. Dietrich, B. Neumüller, and K. Dehnicke, Text book of engineering drawing, 1998.

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Laboratory Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	**CO2**	**CO3**
PO4	√	√	
PO5			√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
CO1	√					√		√
CO2		√		√	√			
CO3			√				√	

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
A6	PLO6	√	√	√	√	√	√		
A5	PLO8							√	√

3.4. Assessment Alignment Matrix

SC	PLOs	POs	CLOs	Teaching M.	Assessment M.
A6	PLO6.	PO 5	CLO1	Lectures	First ,Second and Final exam Quizzes (C.W)
				Tutorials.	Assignments (H.W)
			CLO2	Lectures	First ,Second and Final exam Quizzes (C.W)
				Tutorials.	Assignments (H.W)
			CLO3	Discussions	Discussion
			CLO4	Discussions	Discussion
			CLO5	Discussions	Discussion
			CLO6	Lectures	First ,Second and Final exam Quizzes (C.W)
				Tutorials.	Assignments (H.W)
A8	PLO8.	PO 4	CLO7	Lectures	First ,Second and Final exam Quizzes (C.W)
				Tutorials.	Assignments (H.W)
			CLO8	Lectures	First ,Second and Final exam Quizzes (C.W)
				Tutorials.	Assignments (H.W)

Course Coordinator: DR. Ahmed Saied Faheim El-Saaey

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	English Language		**Code**	UHS101
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (First Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	-	-	2

2. Professional Information:

2.1. Course description:

A review of grammar rules and composition mechanisms, some composition rules, active sentences and their characteristics, most common mistakes in writing technical English sentences, making paragraph and main ideas, types of paragraphs, reading and analyzing some parts of technical writing in various engineering fields to improve communicating skills.

2.2. Course Objectives (CO):

The students will be able to:

Program objective		Course objective	
PO4	Master self-learning and life - long learning strategies to communicate effectively in academic/professional fields.	**CO1**	**Use** written and oral communication in a range of situation with an emphasis on academic communication.
		CO2	**Illustrate** the academic terminologies related to their field of specialization

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO1	**Apply** basic research skills through constructing a project related to an engineering or science related situation.
A8	PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO2	**Identify** the appropriate written and oral communication in different situations in English.
			CLO3	**Communicate** efficiently to convey ideas verbally.
			CLO4	**Discuss** the abstract ideas and arguments from a range of texts.
A10	PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO5	**Use** vocabulary as a key ingredient in developing advanced written skills.
			CLO6	**Practice** a range of grammatical structures and vocabulary accurately and effectively.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,4,5,6		CLO1,3

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to course content	1-2		√	√	√		
Will &be going to	3						√
Working ,forming and heat treating metal	4	√				√	
Prefixes	5		√			√	
Minerals and ceramics	6	√					
First Exam	7		√	√			
Subject –verb agreement	8		√	√	√		
Design solutions	9	√				√	
Adjectives	10						√
Dimensions of circles	11	√					
Second Exam	12		√		√		

Compounds	13	√					
Interconnection	14					√	√
Non-ferrous metals	15	√				√	√
Final Exam	16		√	√	√		
Total	**16**	**6**	**3**	**3**	**3**	**5**	**4**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1. Lecture		√	√	√		
2. Discussion			√			
3. Interactive Learning			√	√		
4. Self- learning	√				√	√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
1. Tests	First Exam		√	√			
	Second Exam		√		√		
2. Discussions				√		√	
3.Reports		√					√
4.Observation				√	√		
Summative Assessment Method							
Final Exam			√	√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30 %
	Second Exam	12	20 %
Discussion		9,11,12	4%
Report		9, 15	3%
Observation		1,2,13-15	3%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	Folse, Keith, April Muchmore-Vokoun and Elena Vestri Solomon. Great Essays. 3rd ed. U.K.: Heinle Cengage Learning, 2010.
Recommended Books:	Murphy, R. and Smalzer, W., 2000. Grammar in use. Cambridge: Cambridge University Press
	Mulvey, D., 2002. Grammar the easy way. Hauppauge, N.Y.: Barron's
Periodicals, Web Sites, … etc:	http:// www.duolingo.com https://elt.oup.com

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data show
White board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO4	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√	√			
CO2				√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A5	PLO5	√					
A8	PLO8		√	√	√		
A10	PLO10					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO4	CLO1	Self- learning	Reports
A8	PLO8		CLO2	Lecture	First , and Second Exams
			CLO3	Lecture	First , and Final Exams
				Interactive Learning	Observation
				Discussion	Discussions
A10	PLO10		CLO4	Lecture	Second and Final Exams
				Interactive Learning	Observation
			CLO5	Self- learning	Discussion
			CLO6	Self- learning	Reports

Course Coordinator: **Mohamed Abd El-Ghany**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management				
Department Offering the course	Construction Engineering and Management				
Date of Specification Approval	**5/9/2023**				
Course Title	Social Issus			**Code**	UHS102
Type	**Compulsory** ☒		**Elective** ☐		
Semester	Spring Semester (Second Level)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**	
	2	0	0	2	

2. Professional Information:

2.1. Course description:

In this course, the social problems facing societies in the modern era are studied. Topics include problems related to the population issue, citizenship, a culture of tolerance and acceptance of the other, globalization, and violence against women. Social problems will be analyzed from different social perspectives to better understand their possible causes and consequences. Strategies for addressing social problems will be discussed and evaluated.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO1**	**Analyze** different social issues and illustrate how to deal with heterogeneous team
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields	**CO2**	**Evaluate** the origins of social problems in the structure of existing social institutions to communicate effectively in professional fields

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning	CLO1	**Examine** scientific research, various types of research, appropriate methods, technologies and data that sociologists use to investigate the human condition;
A7	PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO2	**Analyze** different social issues that related with the individual as a member of multi-cultural teams.
A10	PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO3	**Practice** self, learning strategies in different social issues
			CLO4	**Evaluate** competing social scientific theories regarding the origins of social problems using lifelong and other learning strategies.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO3,4	CLO1,2

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
1.Introduction in social issues.	1		√		
2.Recognize the structural, systemic factors which affect the quality of life of persons of different ages, gender, social class, sexual orientation, disability, and racial/ethnic backgrounds;	2,3				√
3.Problems related to the population issue.	4,5		√		
4.Problems related to citizenship.	6	√		√	
5.First Exam	7				√
6.Problems related to citizenship.	8		√		
7.Problems related to a culture of tolerance and acceptance of the other.	9,10		√		
8.Problems related to globalization.	11		√		
9.Second Exam	12			√	√
10. Problems related to violence against	13	√		√	

women					
11. Present alternative explanations or theories of social phenomena	14				√
12. Review	15	√	√		√
13. Final Exam	16		√		√
Total	16	**3**	**8**	**2**	**4**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture				√
2. Report	√	√		
3.Self Learning			√	
4. Hybrid Learning				√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Test	**First Exam**				√
	Second Exam			√	√
Report			√		
Presentations		√			
Summative Assessment Method					
Final Exam				√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second)Exams	7,12	50
Report		6,13	5
Presentations		13	5
Summative Assessment Method			
Final exam		16	40
Total		16	100

2.9. List of References:

Course Notes:	Lecturer Notes
Essential Books (Textbooks):	Lauer, Robert and Jeanette Lauer. 2016. Social Problems and the Quality of Life, 13th Edition. New York: NY. McGraw Hill w/Connect.
Web Sites	https://beng.bu.edu.eg/item/1739-2022-05-29-11-57-14

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A5	PLO5	√			
A7	PLO7		√		
A10	PLO10			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO3	CLO1	Report	Presentations
A7	PLO7		CLO2	Report	Report
A10	PLO10	PO4	CLO3	Self - Learning	Second, and Final Exams
			CLO4	Lecture Hybrid Learning	First, Second, and Final Exams

Course Coordinator: Dr. Ibrahim El-Shenawy

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Basic Architectural Engineering	**Code**	CMA208	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring **Semester**. (second Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	1	2	-	2

2. Professional Information:

2.1. Course description:

Pr.Req. : Engineering Graphics (FRM 109)

Role of the architect and other engineers in building construction, Architectural design fundamentals, Building components and materials, Architectural drawing and detailing.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	CO1	**Outline** the architectural vocabulary and drawings which used in architectural drawings.
		CO2	**Produce** the architectural drawings of small projects in form of different architectural projections.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A8	PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO1	**Discuss** effectively simple architectural drawings.
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership	CLO2	**Generate** manual architectural drawings for small projects through

		skills to anticipate and respond to new situations.		imagination and creativity.
D1	**PLO15**	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies and human sciences	**CLO3**	**Recognize** the building components and materials of small architectural projects.
			CLO4	**Generate** missing view from given two orthographic views.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,3	**CLO4**	**CLO2**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to course content and architecture design	1			√	
Different types of architectural drawings	2		√		
Explain how to draw architectural plans	3	√	√		
Explain how to draw architectural sections	4	√	√		√
Explain how to draw architectural elevations	5	√	√		√
Explain how to draw architectural layout	6	√	√		√
First Exam	7				√
Introduction to the project	8		√		√
The fundamentals of drawing main building components	9			√	
Introduction to architectural presentation techniques	10				
Design principles and development of design solutions	11			√	
Second Exam	12		√	√	
Concepts and considerations in small building types	13			√	
Diagram of relationships of spaces, shapes of buildings and movements	14			√	
Final sketch & discussion	15	√	√		√
Final Exam	16		√		√
Total	**16**	**5**	**9**	**6**	**7**

2.6 Lab Topics

N.A

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√	√	
2. Tutorial		√		√
3. Project-based Learning		√	√	√
4. Discussion	√		√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
1. Tests	First Exam				√
	Second Exam		√	√	
2. Mini Project		√	√		√
3. Presentation		√			
4.Discussion				√	
Summative Assessment Method					
Final Exam			√		√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30 %
	Second Exam	12	20 %
Mini Project		13	6%
Presentation		14	2%
Discussion		11,13	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	Principles and Practice of Engineering by Mark McAfee, ASCE, Second Edition, 2010.
Recommended Books:	Ching, F., and Juroszek, S. (2018). Design Drawing. 3 rd ed., Hoboken, NJ: John Wiley & Sons, Inc.
	Karlen, M. and Fleming, R. (2016). Space Planning Basics. Hoboken, NJ: John Wiley & Sons, Inc.
Periodicals, Web Sites, … etc:	• https://www.arch2o.com/

2.10 Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√		√	
CO2		√		√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A8	PLO8	√			
A9	PLO9		√		
D1	PLO15			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A8	PLO8	PO1	CLO1	• Lecture	• Presentation
				• Discussion	• Mini Project
A9	PLO9		CLO2	• Lecture	• Second and Final Exams
				• Tutorial	
				• Project- based learning	• Mini Project
D1	PLO15		CLO3	• Lecture	• Second and Final Exams
				• Discussion	• Discussion
				• Project- based learning	
			CLO4	Tutorial	• First and Final Exams
				• Project- based learning	• Mini Project

Course Coordinator: **Ass.Pro.Dr. Mona Yehia Shedid**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Structural Analysis-1		**Code**	CMC201
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Second Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	----	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Mechanics II (FRB104)

Definition of a structure, its support condition, and its various structural forms in addition to various loading conditions that a structure must support. Study the stability and determinacy of structures. Basic concepts of structural analysis. Calculations of reaction forces, calculations of the internal forces (normal forces, shear forces, and bending moments) and their distribution on statically determinate beams, frames, and arches Member forces in trusses. Influence lines and their use to calculate the maximum response functions in structures.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Use** engineering knowledge to identify structural problems.
		CO2	**Analyze** a wide spectrum of engineering, with analytic, critical, and systemic thinking to solve structural problems.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identity, formulate and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	**Identify** the structures and different types of structural elements.
			CLO2	**Describe** the determinacy and stability of structures
B1	PLO11	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of Structural Analysis and Mechanics, Properties, and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO3	**Calculate** the structure support reactions.
			CLO4	**Determine** the internal forces in determinate structural elements using classical methods
			CLO5	**Analyze** the determinate structures for moving loads by using influence lines.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4,5	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Principle of Plane Statics	1,2	√				
Loads and Reactions.	3,4			√		
Stability of structures	5		√			
Analysis of Determinate Beam.	6			√	√	
First Exam	7	√	√	√	√	
Analysis of Determinate Beam.	8			√	√	
Analysis of Determinate Frame.	9,10			√	√	
Analysis of Determinate Truss.	11			√	√	

Second Exam	12	√	√	√	√	
Influence lines for beam	13					√
Influence lines for frame	14					√
Review	15	√	√	√	√	√
Final Exam	16	√	√	√	√	√
Total	**16**	**3**	**2**	**8**	**6**	**3**

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√	√	√	√	√
2. Tutorials		√	√	√	√
3. Hybrid Learning			√	√	
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods:

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Test	(First, Second) Exams	√	√	√	√	
Assignments			√	√	√	√
Summative Assessment Method						
Final Exam		√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		**Week**	**The weighting of Assessment %**
Formative Assessment Method			
Tests	(First, Second) Exams	7,12	50
Assignments		3-6,8-11,13	10
Summative Assessment Method			
Final Exam		16	40
Total			100

2.9. List of References:

Essential Books (Textbooks):	• "Solved Examples in Determinate Structures", Dar-Elmaarefa, Egypt, Dr. Ahmed Youssef Kamal El-Deen, ISBN 21638/**2016**
Recommended Books:	• Structural Analysis by Russell C. Hibbeler, Pearson, 9th Edition, 2014, ISBN-13:978-0-13-394284-2. • George, N. Frantziskonis. "Essentials of the Mechanics of Materials, Second Edition". USA: Destech Publications, Inc. 2013. ISBN 13: 9781605950983 • Pytel, A. and Kiusalaas, J. "Mechanics of Materials Second Edition". Cengage Learning2012. ISBN-13: 978-0-495-66775-9
Periodicals, Web Sites, … etc	• https://byjusexamprep.com/determinate-and-indeterminate-structures-i

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives	
	CO1	CO2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√	√			
CO2			√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A1	PLO1	√	√			
B1	PLO11			√	√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment
A1	PLO1	PO1	CLO1	Lecture	First , Second and Final Exams
			CLO2	Lecture	First , Second and Final Exams
B1	PLO11		CLO3	Lecture	First , Second and Final Exams
				Hybrid Learning	
				Tutorials	Assignments
			CLO4	Lecture	First , Second and Final Exams
				Hybrid Learning	
				Tutorials	Assignments
			CLO5	Lecture	Final Exam
				Tutorials	Assignments

Course Coordinator: Dr. Ahmed Youssef Kamal El-Deen

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Structural Analysis-2		**Code**	CMC202
Type	**Compulsory** ☒		**Elective** ☐	
Semester	Spring Semester (Second Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	1	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Structural Analysis-1 (CMC201)

Properties of Areas, Normal stresses: Axial stresses, Shear stresses, thermal stress, and bending stresses. Transverse loading and torsional stresses, Principal stresses and strains, Elastic deflection of beams. Method of three-moments equations for continuous beams. Buckling of columns.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Analyze** a structural problem, concerning stresses and serviceability.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools	**CO2**	**Use** suitable software to analyze structure problems

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A2	PLO2	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	CLO1	**Use** suitable software to solve structure problems
B1	PLO11	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of Structural Analysis and Mechanics, Properties, and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO2	**Apply** analytical structure techniques (three-moment equations) for indeterminate beams.
			CLO3	**Calculate stresses** (normal, shear principal).
			CLO4	**Determine** the elastic deflection of beams

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Normal stresses	1-4			√	
Shear stresses	5-6			√	
First Exam	7			√	
Shear stresses	8			√	
Principal stresses	9			√	

Elastic deflection of beams	10,11				√
Second Exam	12			√	√
Method of three-moments equations for continuous beams	13		√		
Use SAP software to solve structure problems	14,15	√	√		
Final Exam	16		√	√	√
Total	**16**	**2**	**3**	**8**	**2**

2.6. Lab Topics:

N.A.

Lab Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Using SAP software to solve structure problems	14,15	√			
Experimental Test	16	√			
Total	**3**	**2**			

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture		√	√	√
2. Tutorials		√	√	√
3. Computer-based Instruction	√			
4. Problem-based Learning		√	√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods:

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Test	**First Exam**			√	
	Second Exam			√	√
	Experimental	√			
	Quizzes		√	√	√
Assignments			√	√	√
Summative Assessment Method					
Final Exam			√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method			Week	The weighting of Assessment %
Formative Assessment Method				
Tests	**First Exam**		7	30%
	Second Exam	**Written**	12,16	10%
		Experimental		10%
	Quizzes		3,5,8,10,11	5 %
Assignments			2,3,4,10,11	5 %
Summative Assessment Method				
Final Exam			16	40 %
Total				100 %

2.9. List of References:

Essential Books (Textbooks):	• "Solved Examples in Determinate Structures", Dar-Elmaarefa, Egypt, Dr. Ahmed Youssef Kamal El-Deen, ISBN 21638/**2016**
Recommended Books:	• Structural Analysis by Russell C. Hibbeler, Pearson, 9th Edition, 2014, ISBN-13:978-0-13-394284-2. • George, N. Frantziskonis. "Essentials of the Mechanics of Materials, Second Edition". USA: Destech Publications, Inc. 2013. ISBN 13: 9781605950983 • Pytel, A. and Kiusalaas, J. "Mechanics of Materials Second Edition". Cengage Learning2012. ISBN-13: 978-0-495-66775-9
Periodicals, Web Sites, … etc:	• https://mathalino.com/reviewer/strength-materials/three-moment-equation

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Laboratory Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives	
	CO1	CO2
PO1	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1			√	√
CO2	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A2	PLO2	√			
B1	PLO11		√	√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment
A2	PLO2	PO5	CLO1	Computer-based Instruction	Experimental Test
B1	PLO11	PO1	CLO2	Lecture	Final Exams
				Tutorials	Quizzes
				Problem-based Learning	Assignments
			CLO3	Lecture	First, Second and Final Exams
				Tutorials	Quizzes
				Problem-based Learning	Assignments
			CLO4	Lecture	Second and Final Exams
				Tutorials	Quizzes
				Problem-based Learning	Assignments

Course Coordinator: **Dr. Ahmed Youssef Kamal El-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Properties of Engineering Materials	**Code**	CMC203	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Second Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**2**	**1**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Physics I (FRB107)

Mechanical, physical and chemical properties of engineering materials. Stress-strain behavior, strength, ductility, toughness, and resilience - Testing machines - Calibration devices - Strain gauges - Mechanical properties in tension, compression, bending, shear and torsion. Impact – Fatigue - Hardness.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Apply** wide sets of civil engineering knowledge to identify and solve different problems related to mechanical properties of engineering materials
		CO2	**Illustrate** different tests for engineering materials such as tension, compression, bending, shear, torsion, impact, fatigue and hardness tests

2.3. Course Learning Outcomes (CLO's):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A2	**PLO2**	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use	**CLO1**	Identify mechanical, physical and chemical properties of engineering materials
			CLO2	Explain stress-strain behavior, strength, ductility,

		statistical analyses and objective engineering judgment to draw conclusions		toughness, and resilience lines
B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	Determine the mechanical properties of engineering materials under tension, compression, bending, shear and torsion tests
			CLO4	Discuss the mechanical properties of engineering materials under impact, fatigue and hardness tests

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2,4	**CLO3**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to mechanical, physical and chemical properties of engineering materials	**1,2**	√		√	
Stress-strain behavior, strength and ductility	**3**		√	√	
Toughness	**4**		√	√	
Testing machines - Calibration devices	**5**	√	√	√	
Strain gauges	**6**	√	√	√	
First exam	**7**			√	
Mechanical properties in tension	**8**	√		√	
Mechanical properties in compression and bending	**9,10**	√		√	
Mechanical properties in shear and torsion	**11**	√		√	
Second exam	**12**			√	
Mechanical properties in impact	**13**	√			√
Mechanical properties in fatigue	**14**	√			√

Mechanical properties in hardness	**15**	√			√
Final exam	**16**	√	√	√	√
Total	**16**	**11**	**4**	**4**	**3**

2.6. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Tension test	**8**	√	√		
Compression test	**9**	√	√		
Shear test	**10**	√	√		
Bending test	**11**	√	√		
Torsion test	**11**	√	√		
Oral Test and experimental	**12**	√	√		
Total	**12**	**4**	**4**		

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture			√	√
2. Tutorials			√	√
3. Practical-based Learning	√	√		
4. Reports			√	√
5. Presentation			√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	Oral Test	√	√	√	√
	First Exam			√	
	Second Exam			√	
	Experimental	√	√		
Reports				√	√
Assignments		√	√	√	√
Summative Assessment Method					
Final Exam				√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30
	Second Exam	12	10
	Experimental Test	12	5
	Oral Test	12	5
Report		14	5
Assignments		2 - 6 , 9 - 13	5
Summative Assessment Method			
Final exam		16	40
Total		16	100

2.9. List of Reference:

Essential Books (Textbooks):	Engineering Materials: Properties and Selection by Kenneth G. Budinski, Pearson, 9th Edition, 2017
Periodicals, Web Sites, … etc:	https://byjusexamprep.com/mechanical-properties-of-engineering-materials-i https://mffeci.ekb.eg/linkresolver/openurl/v0.1 Egyptian Knowledge Bank

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Laboratory Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1			√	√
CO2	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A2	PLO2	√	√		
B1	PLO11			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A2	PLO2	PO1	CLO1	• Practical-based Learning	• Oral Test • Experimental Test
			CLO2	• Practical-based Learning	• Oral Test • Experimental Test
B1	PLO11		CLO3	• Lecture	• First , Second and Final Exams
				• Tutorials	• Assignments
				• Reports	• Reports
				• Presentation	• Oral Exam
			CLO4	• Lecture	• Final Exam
				• Tutorials	• Assignments
				• Reports	• Reports

Course Coordinator: Dr Ahmed Abouelfetouh Abdelaziz

Head of Department: Dr. Ahmad Youssef Kamal El Din Mohamed

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	**Construction Materials**		**Code**	**CMC204**
Type	**Compulsory ☒**	**Elective ☐**		
Semester	**Spring Semester (Second Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**2**	**0**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Properties Engineering Materials (CMC203)

Mineral binding materials {Lime, Gypsum & Cement} - Concrete aggregates – Building Rocks - Steel reinforcement – Steel reinforcement - Bricks - Fiber – timber.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Apply** wide sets of construction materials knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve surveying problems in real-life situations.
		CO2	**Solve** engineering problems in the process of the properties of construction materials

2.3. Course Learning Outcomes (CLO's):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A1	**PLO1**	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	**CLO3**	Effectively apply the basic principles to make a Sieve analysis
			CLO4	Use efficiently a suitable property of the construction material which use in making a good concrete

B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural4 Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics	**CLO1**	Identify the basic technologies for the construction of buildings,
			CLO2	Apply a full range of civil engineering concepts and techniques of Properties and Strength of Materials,

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1	**CLO2,3,4**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction	1		√		
Mineral binding materials {Lime}	2	√	√		
Mineral binding materials {Gypsum}	3	√	√		
Mineral binding materials {Cement}	4	√	√		
Concrete aggregates	5	√	√		
Concrete aggregates	6	√	√		
First Exam	7	√	√		
Building Rocks	8		√		
Building Rocks	9		√		
Steel reinforcement	10		√	√	
Steel reinforcement	11		√	√	
Second Exam	12		√	√	
Bricks	13		√		√
Fiber	14		√		√
timber	15		√		√
Final Exam	**16**	√	√	√	√
Total	**16**	**5**	**13**	**2**	**3**

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1. Lectures	√	√	√	√
2. Tutorials	√	√	√	√
3. Presentations		√		√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Repeat the explanation of some of the material and tutorials.				
2. Give them specific tasks and assign a teaching assistance to follow up the performance of this group of students.				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	**First Exam**	√	√		
	Second Exam		√	√	
	Quizzes	√	√	√	√
Presentations			√		√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**(First, Second) Exams**	7,12	50
	Quizzes	3-5,9-10,14	3
Presentations		2,9	7
Summative Assessment Method			
Final Exam		16	40
Total			100

2.9. List of Reference

Essential Books (Textbooks):	Construction Materials, Methods and Techniques by William P. Spence, Delmar Cengage Learning, 4th Edition, 2016
Periodicals, Web Sites, … etc:	• https://structuralengineeringbasics.com/what-types-of-construction-building-materials/ • https://08122ce4x-1103-y-https-iopscience-iop-org.mplbci.ekb.eg/article/10.1088/1742-6596/1378/2/022058 (Egyptian Knowledge Bank)

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√		√	
CO2		√		√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A1	PLO1			√	√
B1	PLO11	√	√		

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
B1	PLO11	PO1	CLO1	• . Lectures • Tutorials	• First and Final exams • Quizzes
			CLO2	• . Lectures • Tutorials	• First, Second and Final exams • Quizzes
				• Presentations	• Presentations
A1	PLO1		CLO3	• . Lectures • Tutorials	• Second and Final exams • Quizzes
			CLO4	• . Lectures • Tutorials	• Final exam • Quizzes
				• Presentations	• Presentations

Course Coordinator: Dr. Amir Sabry Ibrahim

Head of Department: Dr. Ahmed Youssef Kamaldeen El

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Construction Engineering Drawing	**Code**	CMC 205	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Second Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	1	**2**	**-**	**2**

2. Professional Information:

2.1. Course Description:

Pr.Req. : Engineering Graphics (FRM109)

Introduction to construction engineering as related to municipal and regional projects. A brief review of the construction industry. Site layout, erection of steel and concrete structures. Drawing to demonstrate the concepts of various types of civil engineering and construction projects which include: residential and industrial buildings, water resources projects, urban transportation systems, coastal development projects, and environmental protection projects. Design and construction drawing which include architectural systems, structural systems, mechanical and electrical installation .Field trips and analysis of local construction projects.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Analyze the techniques, skills, and appropriate engineering tools, necessary for engineering practice and project management
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles	**CO2**	**Apply** wide sets of civil engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve problems in real-life situations.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A8	PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO1	**Use** construction engineering as related to municipal and regional projects.
			CLO2	Explain A brief review of the construction industry. Site layout, erection of steel and concrete structures.
B2	PLO12	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.	CLO3	Demonstrate the concepts of various types of civil engineering and construction projects which include residential and industrial buildings, water resources projects, urban transportation systems, coastal development projects, and environmental protection projects.
			CLO4	**Examine** design and construction drawing which include architectural systems, structural systems, mechanical and electrical installation.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2,3	CLO4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction of construction engineering	1	√			
Drawing earth slope in bed	2	√	√		
Drawing earth slope in berm	3	√			
Drawing earth slope in bank	4		√		
Drawing stepped retaining walls	5	√		√	
Drawing retaining with battered back	6		√		

First exam	7	√	√	√	
Introduction of steel structure	8		√	√	
Drawing of steel base	9	√			√
Drawing of steel columns	10		√		√
Drawing of steel beams	11	√		√	
Second exam	12		√	√	√
Introduction of concrete structures	13		√	√	
Drawing of culvert concrete buildings	14,15	√	√		√
Final exam	16	√	√	√	√
Total		**8**	**8**	**4**	**4**

2.6. Lab Topics:

Not applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
Lecture	√	√	√	
Tutorials		√	√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Test	**First Exam**	√	√	√	
	Second Exam		√	√	√
Assignments		√	√		√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Formative Assessment Method			
Test	(First, Second) Exam	7,12	50
Assignments		3 - 6 , 9 -13	10
Summative Assessment Method			
Final Exam		**16**	**40**
Total			**100**

2.9. List of Reference:

Course Notes:	Lecture Notes
Essential Books (Textbooks):	- Textbook of Engineering Drawing, Second Edition, K. Venkata Reddy Prof. & HOD of Mechanical Engineering Dept. C.R. Engineering College, Tirupati – 2017
Recommended Books:	- civil engineering drawing - Board of Intermediate Education, AP-2015

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO1	√	
PO2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1		√		√
CO2	√		√	

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A8	PLO8	√	√		
B2	PLO12			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A8	PLO 8	PO1	CLO1	• Lecture	• First and Final Exams • Assignments
			CLO2	• Lecture • Tutorials	• First, Second and Final Exams • Assignments
B2	PLO 12	PO2	CLO3	• Lecture • Tutorials	• First, Second and Final Exams
			CLO4	• Tutorials	• Second and Final Exams • Assignments

Course Coordinator: Dr. Mohamed Samir

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	CAD for Civil Engineers		**Code**	CMC 206
Type	**Compulsory** ☒		**Elective** ☐	
Semester	Spring Semester (Second Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**0**	**2**	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Construction Engineering Drawings (CMC205)

Irrigation structures: Earth works, retaining walls, bridges, culverts, siphons, regulators, and weirs. Utilities structures: Valve chambers, nan holes, settling tanks, filter house, roads intersections. Reinforced concrete structures: footings, column slabs, and beams. Steel structures: columns and beams. Drawings of civil and environmental engineering projects, which includes: residential and industrial buildings, water resources projects, urban transportation systems, coastal development projects, and environmental protection projects.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO1**	Apply techniques, and skills, in AutoCAD, that are necessary for engineering project.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A4	PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	CLO1	Use AutoCAD Software to draw Irrigation structures projects
			CLO2	Apply AutoCAD Software to draw reinforced concrete and steel structures .
B2	PLO12	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.	CLO3	Explain drawing commands
			CLO4	Illustrate modifying commands, and (orthogonal, relative, hatch, Array….) options, layers, dimensions, text, blocks

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO3,4	CLO1,2	

2.5. Course (Lab) Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
1.Introduction.	1			√	
2.Drawing Commands	2-4			√	
3.Modifying Commends	5,6				√
4.First Experimental Test	7			√	√
5.Dimensions, Text, Modify text	8				√
6.Layers, Block.	9				√
7.Irrigation structures drawing.	10,11	√			

8.Second Experimental Test	12			√	√
9.Reinforced concrete structures drawing, Steel structures drawing	13-15		√		
Practical Exam	16			√	√
Total	**16**	**2**	**3**	**4**	**4**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture			√	√
2. Computer-based Instruction	√	√	√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.7 Assessment Methods:

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Test	First Experimental Test			√	√
	Second Experimental Test			√	√
Assignment		√	√		
Summative Assessment Method					
Practical				√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method		**Week**	**The weighting of Assessment %**
Formative Assessment Method			
Tests	First Experimental Test	7	30
	Second Experimental Test	12	20
Assignment		11,14	10
Summative Assessment Method			
Practical		16	40
Total			100

2.8. List of References:

Course Notes:	• AutoCAD Fundamentals. (Manual).
Recommended Books:	• A Textbook of Engineering Drawing: Along with an Introduction to AutoCAD, International Publishing House, 2015. ISBN 9789384588687

2.9. Facilities required for Teaching and Learning

Different Facilities	
Laboratory Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives
	CO1
PO5	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A4	PLO4	√	√		
B2	PLO12			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment
A4	PLO4	PO5	CLO1	Computer-based Instruction	Assignment
			CLO2	Computer-based Instruction	Assignment
B2	PLO12		CLO3	Lecture Computer-based Instruction	First and Second Experimental Test, Practical Exam
			CLO4	Lecture Computer-based Instruction	First and Second Experimental Test, Practical Exam

Course Coordinator: **Dr. Ahmed Youssef Kamal El-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Surveying for Engineering I	**Code**	CMC 207	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Second Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	1	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Mathematics I (FRB101)

Measurement systems and equipment- Handling, adjustment, and regular maintenance of Survey equipment. Theodolites and level instruments- principles of measurements; angular measurements; traverse computations and adjustments. Distance measurements, optical (tacheometric, substance bar), EDM; area computations and subdivision of plots; spirit and trigonometrical levelling; introduction to triangulation, trilateration, resection, intersection and radiation as methods for provision of controls. Coordinate systems for engineering works: Setting out of engineering works. Areas of irregular objects, Longitudinal sections and cross sections- formation level, calculation of cross-sectional areas- Volumes- the end areas method, the prismoidal method, volumes of large earthworks. Balance of cut and fill, volumes from contours. Mass haul diagrams cumulative volumes bulking and shrinkage factor correction.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	**Apply** a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and **solve** engineering problems in real-life situations.	**CO1**	**Apply** wide sets of surveying knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and **solve** surveying problems in real-life situations.
PO5	Apply analytical, **experimental**, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	**Practice** the **experimental**, and surveying techniques and skills with proficiency using modern surveying instruments in a work team.

2.3. Course Learning Outcomes (CLOs):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A2	PLO2	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.	CLO5	**Apply** the fundamental concepts of using tapes, theodolite, and Level instruments.
A7	PLO7	Function efficiently as an individual and as **a member** of multi-disciplinary and multi-cultural teams.	CLO6	**Use** different survey instruments, (tap, theodolite, and level) efficiently as **a member in a working group** in engineering projects.
B1	PLO11	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO1	**Identify** the basic principles of a plane and topographic survey.
			CLO2	**Determine** horizontal and vertical angles, horizontal distance, and reduced level of points.
			CLO3	**Calculate** the coordinate of the traverse, adjust it, and solve the intersection and resection problems.
			CLO4	**Predict** the area and volume of the project.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1	CLO2,3,4,5	CLO6

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1.Introduction to Surveying	1,2	√				√	√
2.Angular Measurement and Theodolite	3,4		√			√	√
3.Distance measurements	5		√				
4.Traversing computation	6			√			
5.First Exam	7	√	√				
6.Traversing adjustment	8			√			
7.Intersection and Resection	9			√			
8.Levelling	10,11	√	√			√	√
9.Second Exam	12	√	√	√		√	
10. Areas Computation	13				√		
11. Volumes Computation	14				√		
12. Review	15	√	√	√	√		
13. Final Exam	16	√	√	√	√		
Total	**16**	**5**	**6**	**4**	**3**	**5**	**5**

2.6. Lab Topics:

Lab Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Use the Tapes to adjust the survey laboratory.	1					√	√
Theodolite instrument	3,4					√	√
Level instrument.	10,11					√	√
Oral & Experimental Test	12					√	
Total	**8**					**5**	**5**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lecture	√	√	√	√		
2. Tutorials		√	√	√		
3. Practical-based Learning					√	
4. Problem-based Learning		√	√	√		
5. Co-operative Learning						√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	**Oral Test**					√	
	First Exam	√	√				
	Second Exam	√	√	√			
	Experimental Test					√	
Discussion			√	√	√		
Observation							√
Summative Assessment Method							
Final Exam		√	√	√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method			Week	The weighting of Assessment %
Formative Assessment Method				
Tests	**First Exam**		7	30%
	Second Exam	**Written**	12	10%
		Oral Test		5%
		Experimental		5%
Discussion			3,5,8,10,13	5 %
Observation			1,3,4,10,11	5 %
Summative Assessment Method				
Final Exam			16	40 %
Total				100 %

2.9. List of References:

Course Notes:	• Lecturer Notes
Essential Books (Textbooks):	• Surveying for Civil and Mine Engineers Theory, Workshops, and Practicals-John Walker Joseph L. Awange- **2018**-ISBN 978-3-319-53128-1- ISBN 978-3-319-53129-8 (eBook)
Recommended Books:	• Elementary Surveying - An Introduction to Geomatics -Thirteenth Edition-2012-CHARLES D. GHILANI-ISBN-13: 978-0-13-255434-3-ISBN-10: 0-13-255434-8 • Surveying Engineering & Instruments- Valeria Shank- First Edition-2012- ISBN 978-81-323-4403-2
Periodicals, Web Sites, … etc:	• https://www.lawinsider.com/dictionary/survey-plan#:~:text=Survey%20Plan%20means%20the%20plan,Sample%201 Sample%202 • https://0810ole6z-1105-y-https-www-webofscience-com.mplbci.ekb.eg/wos/woscc/full-record/WOS:000931961700049?SID=EUW1ED0D57dNJ5kJCin9AAaFD1YUc Egyptian Knowledge Bank

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Laboratory Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives	
	CO1	CO2
PO1	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√	√	√		
CO2					√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A2	PLO2					√	
A7	PLO7						√
B1	PLO11	√	√	√	√		

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
A2	PLO2	PO5	CLO5	Practical-based Learning	Oral and Experimental Test
A7	PLO7		CLO6	Co-operative Learning	Observation
B1	PLO11	PO1	CLO1	Lecture	First , Second and Final Exams.
			CLO2	Lecture	First , Second and Final Exams.
				Tutorials	
				Problem-based Learning	Discussion
			CLO3	Lecture	Second and Final Exams.
				Tutorials	
				Problem-based Learning	Discussion
			CLO4	Lecture	Final Exam.
				Tutorials	
				Problem-based Learning	Discussion

Course Coordinator: Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management				
Department Offering the course	Construction Engineering and Management				
Date of Specification Approval	**5/9/2023**				
Course Title	Concrete Technology			**Code**	CMC 209
Type	**Compulsory** ☒		**Elective** ☐		
Semester	Fall Semester (Second Level)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**	
	1	2	0	2	

2. Professional Information:

2.1. Course description:

Introduction to concrete as a structural material - Mixing water - Concrete manufacture - Properties of fresh concrete - Properties of hardened concrete - Durability of concrete - Mix design methods - Non-destructive testing - Concrete admixtures - Special concretes.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO1**	**Apply** concrete technology knowledge, science, and specialized skills.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	**Calculate** the suitable concrete mix for the required project, with performing the development method to the properties of the concrete.

2.3. Course Learning Outcomes (CLO's):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A3	**PLO3**	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	**CLO1**	**Apply** suitable mix design, for producing concrete for engineering works.
			CLO2	**Explain** the basic principles of concrete technology to select the able components of concrete.

		principles and contexts of sustainable design and development.		
B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	**Illustrate** the different types of concrete.
			CLO4	**Examine** the properties and strength of materials of concrete.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,3,4	**CLO1**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
1.Introduction to concrete as a structural material	1		√		
2.Cement manufacturing	2		√		
3.Cement types	3	√	√	√	
4.Fine and coarse Aggregates	4,5	√		√	
5.Water mixing and admixtures	6	√	√		
6.First Exam	7	√	√	√	
7.Concrete manufacture	8		√		√
8.Properties of fresh concrete	9	√		√	
9.Properties of hardened concrete	10	√		√	√
10. Mix design methods	11	√	√		√
11. Second Exam	12	√	√	√	√
12. Special concretes	13,14			√	√
13. Review	15	√	√	√	√
14. Final Exam	16	√	√	√	√
Total	16	**8**	**7**	**8**	**6**

2.6. Lab Topics:
(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√	√	√
2. Tutorials	√	√	√	√
3. Report			√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Test	First Exam	√	√	√	
	Second Exam	√	√	√	√
Report				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second)Exams	7,12	50
Report		9,11	10
Summative Assessment Method			
Final exam		16	40
Total		16	100

2.9. List of References:

Essential Books (Textbooks):	Concrete Technology. D. K. Gupta, S. A. Rasal, S. P. Bajad, V. K. Sonarkar. Fifth Edition.**2018**. ISBN: 9789383971718
Recommended Books:	Concrete Technology. E. M. Neville, Pearson, Second Edition, 2010.

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO2	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1		√	√	
CO2	√			√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A3	PLO3	√	√		
B1	PLO11			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO3	PO2	CLO1	Lecture	First ,Second, and Final Exams
				Tutorials	
			CLO2	Lecture	First ,Second, and Final Exams
				Tutorials	
B1	PLO11	PO5	CLO3	Lecture	First ,Second, and Final Exams
				Tutorials	
				Report	Report
			CLO4	Lecture	Second, and Final Exams
				Tutorials	
				Report	Report

Course Coordinator: **Dr. Ahmed Elsayed Abdelghafar Elhadary**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Titel	Construction Engineering and Management				
Department Offering the course	Construction Engineering and Management				
Date of Specification Approval	**5/9/2023**				
Course Title	Fundamental of Thermal Engineering			**Code**	CMM210
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**Spring Semester (Second Level)**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**	
	2	2	0	3	

2. Professional Information:

2.1. Course Description:

Pr.Req. : Physics I (FRB107)

Introduction of Thermodynamics- First low of thermodynamics for closed and steady flow open system- Second low of thermodynamics, thermal efficiency of heat engines, Refrigeration cycles and heat pumps, COP of refrigerators and heat pump- gas mixture properties-Modes of heat transfer, Conduction and composite walls, convection, and radiation.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Identify** the fundamental basics of thermodynamics.
		CO2	**Apply** the first and second low for the thermal system.
		CO3	**Recognize** the fundamental basics of heat transfer modes.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	**PLO1**	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and	**CLO1**	**Identify** the basic principles of thermodynamics.
			CLO2	**Apply** the first law of thermodynamics to closed and open systems.
			CLO3	**Practice** the first law of

		mathematics.		thermodynamics to engineering systems.
			CLO4	**Solve** the second law of thermodynamics
B2	**PLO12**	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.	**CLO5**	**Calculate** the basic gas mixture properties.
			CLO6	**Recognize** gas-vapor mixtures and air conditioners processes and applications.
			CLO7	**Distinguish** the thermal efficiency of heat engines and COP of the refrigerator cycle.
			CLO8	**Characterize** the different modes of heat transfer and composite walls.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,6,7,8	**CLO2,3,4,5**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Introduction to thermodynamics	1,2	√							
Pressure and temperature measurement	3	√							
Calculate work and heat	4	√	√						
First law of thermodynamics for closed systems	5,6	√	√						
First Exam	7	√	√						
First law of thermodynamics for open systems	8,9	√	√	√					
Second law of thermodynamics	10	√	√	√	√			√	
Simple rankine and refergation cycles	11		√	√	√				√
Second Exam	12	√	√	√	√				
Gas mixtures	13					√			
Gas-vapor mixtures	14						√		
Introduction to heat transfer	15							√	√
Final	16	√	√	√	√	√	√	√	√
Total	16	**9**	**8**	**5**	**2**	**2**	**2**	**3**	**2**

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
1. Lecture	√	√	√	√	√	√	√	√
2. Tutorials		√	√	√	√	√	√	√
3. Reports					√	√	√	
Teaching and Learning Methods for Students with Special Needs:								
Methods								
1. Discussion Session								
2. Extra Lectures								
3. Provide different levels of books and materials								

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Formative Assessment Method									
Tests	First Exam	√	√						
	Second Exam	√	√	√	√				
Assignment		√	√	√	√	√	√	√	√
Report						√	√	√	
Summative Assessment Method									
Final Exam		√	√	√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Formative Assessment Method			
Tests	First Exam	7	30
	Second Exam	12	20
Report		11,15	5
Assignment		3,6,10,14	5
Summative Assessment Method			
Final Exam		**16**	**40**
Total			**100**

2.9. List of Reference:

Essential Books (Textbooks):	Thermal Engineering Volume 1- by Shiv Kumar (Author)- ISBN-13:978-3030672737, 2022
Recommended Books:	Thermodynamics: An Engineering Approach 8th Edition by Yunus Cengel (Author), Michael Boles. Fundamentals of Thermal-Fluid Sciences, by Yunus Cengel and Robert Turnerm McGraw-Hill Education; 4th edition, 2011.
Periodicals, Web Sites, … etc:	https://mffeci.ekb.eg/linkresolver/openurl/v0.1 (Egyptian Knowledge Bank)

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO1	√	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
CO1	√	√	√					
CO2				√	√	√		
CO3							√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
A1	PLO1	√	√	√	√				
B2	PLO12					√	√	√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	1. Lecture	First, Second,and final exams Assignment
			CLO2	1. Lecture	First, Second and final exams
				2. Tutorials	Assignment
			CLO3	1. Lecture	Second exam
				2. Tutorials	Assignment
			CLO4	1. Lecture	Second exam
				2. Tutorials	Assignment
B2	PLO12		CLO5	1. Lecture	Final exam
				2. Tutorials	Assignment
				3. Reports	Report
			CLO6	1. Lecture	Final exam
				2. Tutorials	Assignment
				3. Reports	Report
			CLO7	1. Lecture	Final exam
				2. Tutorials	Assignment
				3. Reports	Report
			CLO8	1. Lecture	Final exam
				2. Tutorials	Assignment

Course Coordinator: **Dr. Ahmed ELsayed Ibrahim ELseesy**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	**Mathematics III**		**Code**	**FRB201**
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**Fall Semester (Second Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**2**	**0**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Mathematics II (FRB102)

Methods of Integration, some special techniques, successive reduction method, improper integrals, mean value theorem special function: the error, gamma and beta functions of several variables, limits and continuity, partial derivatives, chain rule directional derivatives, Taylor expansions of functions of several variables, extreme, differentiation under integral sign. Ordinary differential equation. First order equations. Non-linear first order differential equations. Operator methods. Methods of variation of parameters. Series solutions of differential equations.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Evaluate and apply wide sets of mathematical methods to identify and solve the differential equations arising from engineering problems in real-life situations.
		CO2	Evaluate, apply and identify some special functions of several variables and their properties which arising from engineering problems in real-life situations.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO1	Identify the name, the order and the degree of the ordinary differential equations (ODEs).
			CLO2	Describe the ODEs in engineering.
			CLO3	Solve linear and non-linear first order ODEs.
			CLO4	Solve higher order ODEs and system of ODEs.
			CLO5	Evaluate improper integrals, limits, continuity and partial derivatives of functions of several variables.
A2	PLO2	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.	CLO6	Apply the basic rules of integration and differentiation to solve the ODEs.
			CLO7	Analyze the final solutions for any problem.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4,5,6,7	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered						
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
Introduction to ordinary differential equations (ODEs)	1,2	√	√					
Solve linear and non-linear first order ODEs.	3- 4			√			√	√
Solve higher order ODEs	5,6				√		√	√

First Exam	7			√	√			
Methods of variation of parameters	8				√		√	√
Operator methods and system of ODEs	9				√		√	√
Series solutions of differential equations.	10			√	√		√	√
Improper integrals and special functions: gamma and beta functions of several variables,	11					√	√	√
Second Exam	12				√	√		
Limits and continuity, partial derivatives, chain rule directional derivatives, Taylor expansions of functions of several variables	13,14					√	√	√
Extreme, differentiation under integral sign.	15					√	√	√
Final Exam	16			√	√	√		
Total	**16**	**2**	**2**	**3**	**5**	**4**	**11**	**11**

2.6. Lab Topics:

There isn't exist Lab in this course.

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**						
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**
1. Lecture	√	√	√	√	√		
2. Tutorials	√	√	√	√	√		
3. Problem-based Learning				√			
4. Discussion	√	√				√	
5. Computer-based Instruction						√	√
Teaching and Learning Methods for Students with Special Needs:							
Methods							
1. Discussion Session							
2. Extra Lectures							
3. Provide different levels of books and materials							

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**						
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**
Formative Assessment Method								
Tests	**First Exam**			√	√			
	Second Exam				√	√		
Discussions		√	√		√		√	
Assignments		√	√	√	√	√	√	√
Summative Assessment Method								
Final Exam				√	√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses%
Formative Assessment Method			
Tests	First Exam	7	30
	Second Exam	12	20
Discussions		1- 15	5
Assignments		2- 15	5
Summative Assessment Method			
Final Exam		**16**	**40**
Total			**100**

2.9. List of Reference:

Course Notes:	Ordinary differential equations, Prof. Dr. Aly N. Elwakeil, 17351, 2009.
Recommended Books:	ERWIN KREYSZIG, ADVANCED ENGINEERING MATHEMATICS, 2011 John Wiley & Sons (Asia) Pte Ltd.
Periodicals, Web Sites, … etc:	• https://byjus.com/maths/methods-of-integration/ • https://mffeci.ekb.eg/linkresolver/openurl/v0.1 Egyptian Knowledge Bank

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes						
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
CO1	√	√	√	√			
CO2					√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes						
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
A1	PLO1	√	√	√	√	√		
A2	PLO2						√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	Lecture	Discussions
				Tutorials	Assignments
				Discussion	Discussions.
			CLO2	Lecture	Discussions
				Tutorials	Assignments
				Discussion	Discussions.
			CLO3	Lecture	First and Final Exams
				Tutorials	Assignments
			CLO4	Lecture	First ,Second and Final Exams
				Tutorials	Assignments
				Problem-based Learning	Discussions
			CLO5	Lecture	Second and Final Exams
				Tutorials	Assignments
A2	PLO2	PO1	CLO6	Computer-based Instruction	Assignments
				Discussion	Discussions
			CLO7	Computer-based Instruction	Assignments

Course Coordinator: Dr. Doaa Ahmed Abd-Elwahab Hammad

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	**Mathematics IV**		**Code**	**FRB202**
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**Spring Semester (Second Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**2**	**0**	**3**

2. Professional Information:

2.1. Course Description:

Pr.Req. : Mathematics III (FRB201)

Sequences, series, convergence and convergence tests, uniform convergence. Fourier series expansions of general periodic functions, expansions of even and odd functions, convergence and remarks. Laplace transform. Conditions for the existence of LP. Inverse LP. Applications of the transform to solve differential and integral equations. Vector algebra. Scalar and cross product. Identities, application. Lines and planes in space. Spherical and cylindrical systems. Quadratic surfaces. Line, surface and volume integral. Green's and Stock's and Divergence theorems

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Evaluate a wide sets of mathematical methods to identify and solve the differential equations and integral equations arising from engineering problems in real-life situations.
		CO2	Apply, identify and evaluate some general periodic functions and their properties which arising from engineering problems in real-life situations.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO1	Use the Laplace transform to solve higher order ordinary differential equations (ODEs), system of ODEs and integral equations.
			CLO2	Evaluate the spherical and cylindrical systems and line, surface and volume integral.
			CLO3	Apply convergence tests and Fourier series expansions.
A2	PLO2	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.	CLO4	Apply the basic rules of integration and differentiation to solve the ODEs, line, double and triple integrals.
			CLO5	Determine the final solutions for series and LaPlace transformations.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Series and convergence tests.	1,2			√		
Fourier series expansions	3,4			√		
Laplace transform	5,6	√				√
First Exam	7	√		√		
Inverse Laplace transform	8	√			√	√
Applications of the Laplace transform to solve differential and integral equations	9	√			√	√
Line, double and triple integrals	10,11	√			√	√
Second Exam	12	√	√			
Spherical and cylindrical systems and line, surface and volume integrals	13,14		√		√	√

Green's and Stock's and Divergence theorems	15		√		√	√
Final Exam	16	√	√	√		
Total	**16**	**6**	**3**	**4**	**7**	**9**

2.6. Lab Topics:

There isn't exist Lab in this course.

2.7Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√	√	√		
2. Tutorials	√	√	√		
3. Problem-based Learning	√	√	√		
4. Discussion	√	√	√		
5. Computer-based Instruction				√	√
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	**First Exam**	√		√		
	Second Exam	√	√			
Discussions		√	√	√		
Assignments		√	√	√	√	√
Summative Assessment Method						
Final Exam		√	√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Formative Assessment Method			
Tests	**First Exam**	7	30
	Second Exam	12	20
Discussions		2 -6,8-11,13	5
Assignments		2 -6,8-10,13-14	5
Summative Assessment Method			
Final Exam		**16**	**40**
Total			**100**

2.9. List of Reference:

Course Notes:	Differential equations II, Prof. Dr. Aly N. Elwakeil, 17351, 2009.
Recommended Books:	• ERWIN KREYSZIG, ADVANCED ENGINEERING MATHEMATICS, 2011 John Wiley & Sons (Asia) Pte Ltd. • Thomas Calculus 11th Edition (2005).
Periodicals, Web Sites, … etc:	• https://www.maths.engineering/

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√	√	√		
CO2				√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A1	PLO1	√	√	√		
A2	PLO2				√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	Lecture	First, Second and Final Exams
				Tutorials	
				Problem-based Learning	Assignments
				Discussion	Discussions
			CLO2	Lecture	Second and Final Exams
				Tutorials	
				Problem-based Learning	Assignments
				Discussion	Discussions
			CLO3	Lecture	First, and Final Exams
				Tutorials	
				Problem-based Learning	Assignments
				Discussion	Discussions
A2	PLO2		CLO4	Computer-based Instruction	Assignments
			CLO5	Computer-based Instruction	Assignments

Course Coordinator: Dr. Doaa Ahmed Abd-Elwahab Hammad

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Program Offering the Course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Technical Writing		**Code**	HS201
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**Fall Semester (Second Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	0	0	2

2. Professional Information:

2.1. Course description:

Types of reports, contents of reports, reduced reports, detailed reports, importance and object of reports, text writing, means of graphs representation, means used for representation of report writing principles of speech, types and contents of representation screens for speech, means of research references, references, training on writing the technical reports and speech.

2.2. Course **Objectives (CO):**

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Apply** knowledge to use written communication in your work and personal experience in real-life situations.
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO2**	**Improve** skills needed to successfully communicate in a modern world through written materials.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A8	PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO1	**Identify** many types of writing frequently required in a variety of careers
			CLO2	**Practice** audience analysis and develop effective communication strategies for a variety of audiences
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO3	**Develop** skill in composing and revising on the computer documents with formats and language appropriate for those purposes
			CLO4	**Demonstrate** in your writing the effective communication principles encouraged by professional writers

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1		CLO2,3,4

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
The Goal of Technical Writing	1	√	√		
Writing different types of Reports	2	√			
Characteristics of Technical Writing	3	√	√		
Basic structure for project report	4			√	
Abstracts and executive summaries	5			√	
Brochures	6			√	
Email	6	√			√
First Exam	7	√	√	√	
creating an effective presentation	8		√		√
Finding job opportunities	9	√	√		
Creating a resumé	9	√	√		
Writing a cover letter	9	√	√		
Interviewing	10	√	√		√
Writing a follow-up letter	10	√			
Creating a Procedures	11			√	

Second Exam	12	√	√		√
Web Pages	**13**				√
Questionnaire	**14**				√
Case Study on report writing	**15**	√	√	√	√
Final Exam	16	√	√	√	√
Total	**14**	**7**	**6**	**5**	**6**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture	√	√	√	√
2. Interactive learning	√	√	√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session	√	√	√	√
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	First Exam	√	√	√	
	Second Exam	√	√		√
Observation		√	√	√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Formative Assessment Method			
Tests	First Exam	7	30
	Second Exam	12	20
Observation		1-14	10
Summative Assessment Method			
Final Exam		16	40
Total			100

2.9. List of References:

Reference Book:	Van Laan, Krista. “The Insider's Guide to Technical Writing.” XML Press, 2022.
Recommended Books:	Norman Fenton, ‘Improving your Technical Writing Skills,’ School of Electronic Engineering and Computer Science Queen Mary (University of London), February 2013.
Periodicals, Web Sites, … etc:	

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A8	PLO8	√	√		
A9	PLO9			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A8	PLO8	PO1	CLO1	• Lecture	• First ,Second and Final Exams
				• Interactive learning	• Observation
			CLO2	• Lecture	• First ,Second and Final Exams
				• Interactive learning	• Observation
A9	PLO9	PO4	CLO3	• Lecture	• First , and Final Exams
				• Interactive learning	• Observation
			CLO4	• Lecture	• Second and Final Exams
				• Interactive learning	• Observation

Course Coordinator: Ass.Prof. Wael A. Mohamed

Program Coordinator: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Engineering Economics		**Code**	UHS202
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (Second Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**-**	**-**	**2**

2. Professional Information:

2.1. Course description:

Principles of Economics, Economical Analysis, Cost estimation, Comparison between alternatives, Present worth method, Future worth, Depreciation, Taxes, Inflation, Risk and uncertainty, Introduction to Engineering cost analysis and budgeting

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Illustrate engineering problems in break-even, benefit-cost ratio

2.3. Course Learning Outcomes (CLO's):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A1	**PLO1**	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**CLO1**	Apply the appropriate engineering economics analysis methods for : present worth, annual cost, rate-of-return, payback, break-even, benefit-cost ratio.

			CLO2	Identify the cost effectiveness of individual engineering projects using the methods learned and draw inferences for the investment decisions.
A9	**PLO9**	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO3**	Apply the life cycle cost of multiple projects using the methods learned and make a quantitative decision between alternate facilities and/or systems.
			CLO4	Identify all mathematical approach models covered in solving engineering economics problems: mathematical formulas, interest factors from tables, Excel functions and graphs. Estimate reasonableness of the results.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	**Psychomotor**	**Affective**
CLO2,4	**CLO1,3**	

2.5. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Concept of engineering economics	1-2	√			
Cash flow diagram and Compound interest formula.	3-4		√		
Time value of money	5-6	√	√		
First Exam	7	√	√		
Nominal and effective interest and Equivalence	8-9	√		√	
Present worth value, Annual cost, and Benefit/Cost ratio	10-11		√	√	
Second Exam	12			√	√
Economic analysis of engineering alternative	13-14	√		√	√
Rate of return – Depreciation – Income taxes and Market survey and replacement rates.	15		√	√	√
Final Exam	16	√	√	√	√
Total	**16**	**8**	**7**	**7**	**3**

2.6 Lab Topics:
Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1.Lecture	√	√		
2. Problem-based Learning	√	√	√	√
3. Discussion	√	√		
4. Project-based Learning			√	√
5. Reports			√	√
6. Hybrid Learning			√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**	√	√		
	Second Exam			√	√
Presentation				√	√
Discussion		√	√	√	√
Report				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Formative Assessment Method			
Test	(First, Second) Exam	7,12	50
Report		5,11	4
Discussion		8,13	3
Presentation		2,4,6,14	**3**
Summative Assessment Method			
Final Exam		**16**	**40**
Total			**100**

2.9. List of Reference:

Course Notes:	(ibrahim sabry) Engineering economy
Essential Books (Textbooks):	"Principles of Economics" - 2020, An Asian Edition, N. Gregory Mankiw, Euston Quah and Peter Wilson, Delmar, Cengage Learning, ISBN-13: 978-981-4227-87-2
Recommended Books:	Engineering economics 7th edition solution manual blank R. Panneerselvam, ISBN-978-81-203-1743-7,2018.
Web Sites	https://www.hzu.edu.in/engineering/engineering%20economy.pdf

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective
	CO1
PO1	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A1	PLO1	√	√		
A9	PLO9			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	1.Lecture	First and Final Exams
				2. Problem-based Learning	Discussion
				3. Discussion	
			CLO2	1.Lecture	First, and Final Exams
				2. Problem-based Learning	Discussion
				3. Discussion	
A9	PLO9		CLO3	1. Hybrid Learning	Second and Final Exam
				2. Problem-based Learning	Discussion
				3. Project-based Learning	Presentation
				4. Reports	Reports
			CLO4	1. Hybrid Learning	Second and Final Exam
				2. Problem-based Learning	Discussion
				3. Project-based Learning	Presentation
				4. Reports	Reports

Course Coordinator: **Dr. Ibrahim Sabry** د. ابراهيم صبري

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Department Offering the program	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	**Hydraulics for Civil Engineer**		**Code**	**CMC 301**
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**Fall Semester (**Third Level**)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**1**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Physics I (FRB107)

Hydrostatic, hydrostatic applications, pressure forces, flow conservation equation, continuity equation, energy equation (Bernoulli's equation), momentum equation, flow measurements, orifices and weirs, flow in closed conduits, flow in open channels, and flow in pipeline system; pipes in parallel; pipeline network, pumps.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Demonstrate** the fundamental principles of hydraulics to solve the practical problems in Civil Engineering
		CO2	**Solve** practical problems in fluid mechanics, open channels flow and flow in pipeline system.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO3**	**Apply** laboratory experiments and available online software packages to solve flow and hydraulics problems.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A2	PLO2	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.	CLO1	**Conduct** laboratory experiments using hydraulic devices
			CLO2	**Discuss** the results from physical equations of hydraulics by comparing them with the experimental and numerical simulation tests.
A3	PLO3	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.	CLO3	**Apply** the concepts of hydraulics to compare between the flow in open channel and pipe flow.
			CLO4	**Apply** civil Engineering processes for flow in open channels and pipeline systems
B1	PLO11	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO5	**Execute** hydraulic applications using Mass, Energy and Momentum equations.
			CLO6	**Solve** complex problems in hydraulics

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction & Dimensions and Units	1						√
Fluid Properties	2	√	√				√
Hydrostatic	3						√
Pressure Distribution and Measurements	4						√
Pressure Forces on Submerged Surfaces	5						√
Fluids in Relative Equilibrium	6			√			√
First Exam	7			√			√
Fluid Kinematics and Continuity equation	8			√		√	√
Hydrodynamics & Energy Equation	9	√	√	√		√	√
Applications of Bernoulli's Equation	10	√	√			√	√
Momentum Equation and its Applications	11					√	√
Second Exam	12			√		√	√
Flow in Pipes and open channel flow	13	√	√	√	√	√	√
Flow in Pipes and Pipes Systems	14	√	√	√	√	√	√
Revision	15				√		√
Final Exam	16			√	√	√	√
Total	16	5	5	8	4	8	16

2.6. Lab Topics:

Lab Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Determine Densities, Specific Gravities, Weights, and Viscosity	2	√	√				
Bernoulli's Theorem Demonstration.	9	√	√				
Flow through sharp edged Orifice.	10	√	√				
Flow over Rectangular and Triangular Weirs.	12	√	√				
Open Channel Flow	13	√	√				
Friction in a smooth bore pipe, Minor loss Experiment.	14	√	√				
Total	6	7	7				

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lecture			√	√	√	√
2. Tutorials			√	√	√	√
3. Practical-based Learning	√	√				
4. Reports		√				
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	Oral Test	√	√				
	First Exam			√			√
	Second Exam			√		√	√
	Quizzes			√	√	√	√
	Experimental	√	√				
Report			√				
Summative Assessment Method							
Final Exam				√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second) Exams	7,12	50
	Oral Test	15	2
	Experimental	12	3
	Quizzes	After each topic	2
Report		15	3
Summative Assessment Method			
Final exam		16	40
Total			100

2.9. List of References:

Essential Books (Textbooks):	Hydraulics for Civil Engineers by P. Wynn, ICE Publishing. First Edition, 2014
Recommended Books:	Schaum's Solved Problems Series- 2500 Solved Problems in Fluid Mechanics and Hydraulics, by Evett J.B. and Liu C., McGraw-Hill INC. Book Co., London. ISBN-0-07-019783-0
Periodicals, Web Sites, … etc:	- **https://www.brighthubengineering.com/hydraulics-civil-engineering/**

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
laboratory Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives		
	CO1	CO2	CO3
PO1	√	√	
PO5			√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1			√	√		
CO2					√	√
CO3	√	√				

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A2	PLO2	√	√				
A3	PLO3			√	√		
B1	PLO11					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A2	PLO2	PO5	CLO1	• Practical-based Learning	• Oral Test • Experimental
			CLO2	• Practical-based Learning	• Oral Test • Experimental
				• Reports	• Report
A3	PLO3	PO1	CLO3	• Lecture • Tutorials	• First ,Second, and Final Exams • Quizzes
			CLO4	• Lecture • Tutorials	• Final Exam • Quizzes
B1	PLO11		CLO5	• Lecture • Tutorials	• Second, and Final Exams • Quizzes
			CLO6	• Lecture • Tutorials	• First ,Second, and Final Exams • Quizzes

Course Coordinator: **Dr. Fahmy Salah Abdelhaleem**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Water Resources, Irrigation and Drainage	**Code**	CMC 302	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	1	3

2. Professional Information:

2.1. Course description:

Pr.Req. : Hydraulics for Civil Engineer (CMC 301)

Hydrology cycles, rain fall measurements, average rain fall depth consistency check and adjustments of station, records, estimation of missing data, computation of evapotranspiration and infiltration values. Hydrology of Nile basin. Nile water resources. Major projects constructed on the river Nile and suggested storage projects. Steam flow measurements, Hydrograph analysis, flood routing, storage operations, ground water hydrology. Planning of irrigation and drainage networks, water requirements for irrigation, control and management of irrigation water distribution. Preliminary design of irrigation systems. Design of drainage networks, environmental and economical aspects.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Evaluate** and outline the water resources in Egypt.
		CO2	**Solve** practical problems in surface and groundwater flows.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO3**	**Apply** analytical and experimental evaluation methods to Plan irrigation and drainage systems.
		CO4	**Design** different irrigation and drainage systems.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A2	PLO2	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.	CLO1	**Apply** laboratory methods of measuring hydrological components.
			CLO2	**Apply** field methods of measuring levels, discharge, and ground water flow.
B2	PLO12	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.	CLO3	**Analyze** in quantitative terms the processes of precipitation, evaporation, transpiration, infiltration, interception, and depression storage.
			CLO4	**Analyze** the environmental impacts of water resources projects in general and irrigation and drainage projects in specific.
			CLO5	**Calculate** effective rainfall for given hyetographs and watershed conditions.
			CLO6	**Solve** engineering problems in surface and groundwater hydrology.
			CLO7	**Design** various in-farm irrigation systems such as flood irrigation, sprinkler and drip irrigation, surge irrigation, and subsurface irrigation.
			CLO8	**Design** drainage systems such as surface drainage, subsurface drainage, and vertical drainage.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2, 3,4,5,6,7,8	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Hydrology cycles	**1**	√				√			
Rainfall	**2**	√		√		√			
Evapotranspiration	**3**	√		√		√			
Infiltration	**4**	√		√		√			
Hydrology of Nile basin	**5**			√	√		√		
Nile water resources	**6**			√	√		√		
First Exam	**7**			√	√	√	√		
Major projects constructed on the Nile River	**8**			√	√		√		
Steam flow measurements& Hydrograph analysis	**9**		√				√		
ground water hydrology	**10**		√	√			√		
Preliminary design of irrigation systems	**11**				√			√	
Second Exam	**12**			√	√	√	√	√	√
Preliminary design of irrigation systems	**13**				√			√	
Design of drainage networks, environmental and economical aspects	**14**				√				√
Design of drainage networks, environmental and economical aspects	**15**				√				√
Final Exam	**16**			√	√	√	√	√	√
Total	**16**	**4**	**2**	**10**	**10**	**7**	**8**	**4**	**4**

2.6. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Measurements of Rainfall	**2**	√			
Measurements of Evaporation	**3**	√			
Measurements of Infiltration	**4**	√			
Measurements of water level	**9**		√		
Measurements of water velocity and discharge	**10**		√		
Total	**5**	**3**	**2**	**-**	**-**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
1. Lecture			√	√	√	√	√	√
2. Tutorials			√	√	√	√	√	√
3. Practical-based Learning	√	√						
4. Project-based Learning			√	√			√	√
Teaching and Learning Methods for Students with Special Needs:								
Methods								
1. Discussion Session								
2. Extra Lectures								
3. Provide different levels of books and materials								

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Formative Assessment Method									
Tests	Oral Test	√	√						
	First Exam			√	√	√	√		
	Second Exam			√	√	√	√	√	√
	Quizzes			√	√	√	√	√	√
	Experimental Test	√	√						
Mini projects				√	√			√	√
Summative Assessment Method									
Final Exam				√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30
	Second Exam	12	20
	Oral Test	12	3
	Experimental	12	2
	Quizzes	After each topic	2
Mini projects		15	3
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	Waller P, Yitayew M, Irrigation and Drainage Engineering, Springer 2016. ISBN: 978-3-319-34631-1
Recommended Books:	- Loki Radoslav, Water Resources Engineering, 2011, Publisher: Pon Press, ISBN 6137819787. - Mays, L.W., Ground and surface water hydrology. John Wiley & Sons, Inc., 2012. ISBN: 978-0-470-16987-2 - Water and Wastewater Calculations Manual by Shun Lin, C. Lee, McGraw-Hill Professional, Second Edition, 2007

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Laboratory Usage
Data Show
White Board
Field Visits

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives			
	CO1	CO2	CO3	CO4
PO1	√	√		
PO5			√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
CO1			√	√				
CO2					√	√		
CO3	√	√						
CO4							√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
A2	PLO2	√	√						
B2	PLO12			√	√	√	√	√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A2	PLO2	PO5	CLO1	• Practical-based Learning	• Oral Test • Experimental
			CLO2	• Practical-based Learning	• Oral Test • Experimental
B2	PLO12	PO1	CLO3	• Lecture • Tutorials • Project-based Learning	• First , Second and Final exams • Quizzes • Mini Projects
			CLO4	• Lecture • Tutorials • Project-based Learning	• First , Second and Final exams • Quizzes • Mini Projects
			CLO5	• Lecture • Tutorials	• First , Second and Final exams • Quizzes
			CLO6	• Lecture • Tutorials	• First , Second and Final exams • Quizzes • Mini Projects
		PO5	CLO7	• Lecture • Tutorials • Project-based Learning	• Second and Final exams • Quizzes • Mini Projects
			CLO8	• Lecture • Tutorials • Project-based Learning	• Second and Final exams • Quizzes • Mini Projects

Course Coordinator: Dr. Fahmy Salah Abdelhaleem

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Design of R.C. Structures1	**Code**	CMC 304	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	0	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Structural Analysis-2 (CMC 202)

Introduction to Reinforced Concrete, Materials used in reinforced concrete, Mechanical properties of hardened concrete and reinforcing steel, Methods of design, Load factors and material factors, Behavior of reinforced concrete sections subjected to flexure for: untracked stage, working stress stage, and ultimate limit state, Design of sections subjected to flexure using both Ultimate Strength Limit state method and Working Stress method, Design of sections for shear, Bond, development length, and reinforcement splices, Design of sections subjected to axial loads – Design of sections under combined flexure and axial compression. Serviceability Limit states (deflection and cracking limit states), Floor systems, Design of solid reinforced concrete one-way and two-way slabs, Design of floor beams, One-way and two-way hollow block slabs.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	**Apply** a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and **solve** engineering problems in real-life situations.	**CO1**	**Apply** the different types of RC design methods.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	**Analyze** the different RC slabs system.

PO5	Apply analytical, **experimental**, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO3**	**Design** the different concrete elements.

2.3. Course Learning Outcomes (CLOs):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A3	**PLO3**	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.	**CLO1**	**Apply** the methods of design according to the standard code.
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO2**	**Use** the code to design of sections subjected to flexure and shear.
B2	**PLO12**	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.	**CLO3**	**Verify** the conditions of serviceability Limit states.
			CLO4	**Design** the different reinforcement concrete structural elements according to ECP.
D2	**PLO16**	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of structural design, construction, technology, and engineering problems	**CLO5**	**Apply** the principals of designing the slabs, and beams**.**
			CLO6	**Make** the reinforcement details and draw the full structure details.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1.Introduction to Reinforced Concrete.	1	√	√				
2.Design of sections subjected to flexure using both Ultimate Strength Limit state method and Working Stress method.	2,3	√	√				
3.Design of sections for shear, Bond, development length, and reinforcement splices.	4	√	√				
4.Design of sections subjected to axial loads, and Design of sections under combined flexure and axial compression.	5	√	√				
5.Serviceability Limit states (deflection and cracking limit states)	6	√		√			
6.First Exam	7	√	√	√			
7.Design of solid reinforced concrete one-way and two-way slabs.	8,9	√			√	√	√
8.Design of floor beams.	10,11	√	√	√	√	√	√
9.Second Exam	12				√	√	√
10. Design of one-way and two-way hollow block slabs	13-15				√	√	√
11. Final Exam	16	√	√	√	√	√	√
Total	**16**	**7**	**5**	**2**	**3**	**3**	**3**

2.6 Lab Topics

N.A.

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lecture	√	√	√	√	√	√
2. Tutorials	√	√	√	√	√	√
3. Discussion			√			
4. Presentation		√			√	√
5. Problem-based Learning				√	√	
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8.Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	**Quizzes**		√		√	√	√
	First Exam	√	√	√			
	Second Exam				√	√	√
Discussion			√	√	√	√	√
Assignments		√	√	√	√	√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
	Quizzes	4,6,11,13	4 %
Discussion		3,5,8,9,10,13	3 %
Assignments		2-6,8-11,13-15	3 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	• Shaker elbehary handbook. • ECP203-2020. • Design of RC Structure halls – DR.M. Hilal • lectures
Recommended Books:	• Design of RC Structure – Vol.01 - DR. Mashhour A. Ghoneim. • Design of Reinforced Concrete by Jack C. McCormac, Russell H. Brown, Wiley, Fifth Edition, 2014

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives		
	CO1	CO2	CO3
PO1	√		
PO2		√	
PO5			√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√				
CO2			√	√		
CO3					√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A3	PLO3	√					
A4	PLO4		√				
B2	PLO12			√	√		
D2	PLO16					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
A3	PLO3	PO2	CLO1	Lecture	First and Final Exams
				Tutorials	Assignments
A4	PLO4	PO5	CLO2	Lecture	First and Final Exams
				Tutorials	Quizzes, and Assignments
				Presentation	Discussion
B2	PLO12	PO1	CLO3	Lecture	First and Final Exams
				Tutorials	Quizzes, and Assignments
				Discussion	Discussion
			CLO4	Lecture	Second and Final Exams
				Tutorials	Quizzes, and Assignments
				Problem-based Learning	Assignments
D2	PLO16	PO5	CLO5	Lecture	Second and Final Exams
				Tutorials	Assignments
				Problem-based Learning	
				Presentation	Discussion
			CLO6	Lecture	Second, and Final Exams
				Tutorials	Quizzes, and Assignments
				Presentation	Discussion

Course Coordinator: **Ass. prof. Dr. Mohamad Makhlouf**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Soil Mechanics		**Code**	CMC 305
Type	**Compulsory ☒**		**Elective ☐**	
Semester	Fall Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**--**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Construction Materials (CMC 204)

Introduction of Soil Mechanics (Soil formation – Soil composition – Soil Structure) - Index properties of variant soil types - Determination of soil characteristics such as Atterberg's limits (LL, PL and SL), Grain size distribution - Soil classification - Water in soil, Seepage and Permeability - Effective stress and vertical stresses in soil mass - Shear strength of soil – Compressibility of soil mass (Compaction and consolidation) – Field soil investigation.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Apply** wide sets of knowledge in soil layers science, and specialized skills with analytical, critical, and systematic thinking to identify and solve soil layers problems.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO4**	**Use** research techniques in the field of soil investigation.
B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO1**	**Identify** the basic principles of soil layers.
			CLO2	**Discuss** the different of properties soil
			CLO3	**Calculate** the physical and mechanical properties of variant soil layers.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	**CLO3**	**CLO4**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction of Soil Mechanics	1	√			
Index properties of variant soil	2		√		
Soil characteristics	3		√		
Soil classification	4		√		
Water in soil	5-6	√			
First Exam	7	√	√		
Stresses in soil mass	8-9			√	
Shear strength of soil	10-11			√	
Second Exam	12			√	
Compressibility of soil mass	13			√	
Field soil investigation	14,15	√			√
Final Exam	16	√	√		
Total	16	7	6	2	3

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√	√	
2. Tutorials		√	√	
3.Report				√
4. Problem-based Learning			√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	First Exam	√	√		
	Second Exam			√	
Report					√
Assignments				√	
Summative Assessment Method					
Final Exam		√	√	√	

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second) Exams	7, 12	50
Reports		15	6
Assignments		9-11,13	4
Summative Assessment Method			
Final Exam		16	40
Total			**100**

2.9. List of Reference:

Essential Books (Textbooks):	• Das, B.M., "Principles of Geotechnical Engineering", 25th Ed., SI Edition Co., 2020, ISBN-10:0-495-41132-9, ISBN-13: 978-0-495-41132-1.
Recommended Books:	- Das, B.M., "Principles of Foundation Engineering", 10th Ed., PWS Publishing Co., 2019, ISBN: 81-7008-081-9. - "Egyptian Code of Practice for Soil Mechanics, Design and Construction of foundations", Parts 1, 2 and 3, Housing and Building Research Center, Cairo, 2020.
Periodicals, Web Sites, … etc:	• https://www.kau.edu.sa/Files/0001553/files/SoilMechBook.pdf • https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/soil-structure • https://byjus.com/biology/soil-profile/

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective
	CO1
PO1	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A5	PLO5				√
B1	PLO11	√	√	√	

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
B1	PLO11	PO1	CLO1	Lecture	First , and Final Exams
			CLO2	Lecture	First , and Final Exams
				Tutorials	
			CLO3	Lecture	Second, and Final Exams
				Tutorials	
				Problem-based Learning	Assignment
A5	PLO5		CLO4	Report	Report

Course Coordinator: Dr. Alnos Aly Easa

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Surveying for Engineers-2		**Code**	CMC 306
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	0	3

2. Professional Information:

2.1. Course description:

Pr.Req. : Surveying for Engineers-1 (CMC 207)

Operations in geodesy; spherical excess and Legendre's formula; shape of the earth - ellipsoid geoid, vertical deflection, selection of spheroid; coordinate systems, change of coordinate systems, computations on the spheroid,; Map projections – distortion, conformal mapping, Gaussian fundamental quantities, isometric co-ordinates, transverse Mercator, UTM Space-based positioning systems (such as GPS and GLONASS) used in conjunction with sophisticated mathematical modeling to solve the problems of determining 3-D position on and near the surface of the earth. GPS system concepts and characteristics, signal structure, receivers and antennae; GPS measurements, GPS time, error sources and measurement accuracy,; position determination techniques - single point and differential positioning, static and kinematic GPS, post mission and Real time processing, DGPS concepts; using GPS for height determination; reference datum and datum transformation.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO1**	**Solve** the problems related to geodetic datum and coordinate systems of the objects on the earth.
		CO2	**Evaluate** the techniques of the point position determination.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO1**	**Apply** research techniques on the map-projection
B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO2**	**Identify** the concepts and theories of Geodesy and Global Navigation Satellite System.
			CLO3	**Discuss** the basic principle of different coordinate systems on the ellipsoid.
			CLO4	**Analyze** the results of geodetic observations using numerical models and calculate their accuracy.
			CLO5	**Evaluate** the different Position determination techniques by Global Navigation Satellite System.
			CLO6	**Use** suitable software to solve the problems of determining 3-D position on and near the surface of the earth

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,3	**CLO4,5,6**	**CLO1**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Introduction to Geodesy: Operations in geodesy, spherical excess and Legendre's formula, and shape of the earth.	1		√				
Ellipsoid, geoid and vertical	2			√			

datum.							
Coordinate systems: change of coordinate systems and computations on the spheroid.	3			√			
Map projections.	4,5	√		√			
Space-based positioning systems	6		√				
First Exam	7		√	√			
GPS system concepts and characteristics	8		√				
Position determination techniques	9,10				√	√	√
Real time processing and DGPS concepts	11				√	√	
Second Exam	12		√		√	√	
Using GPS for height determination	13				√	√	
Reference datum and datum transformation.	14			√			
Revision	15		√	√	√	√	
Final Exam	16		√		√	√	
Total	16	**2**	**4**	**6**	**5**	**5**	**2**

2.6. Lab Topics:

(Not Applicable**)**

2.7Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1. Lecture		√	√	√	√	
2. Tutorials		√	√	√	√	
3. Report	√					
4.Computer-based Instruction						√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Test	First Exam		√	√			
	Second Exam		√		√	√	
Report		√					
Assignments							√
Summative Assessment Method							
Final Exam			√	√	√	√	

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	**7,12**	**50**
Report		**5**	**5**
Assignments		**10**	**5**
Summative Assessment Method			
Final exam		**16**	**40**
Total			**100**

2.9. List of Reference:

Essential Books (Textbooks):	Surveying and geomatics engineering, principles, technologies and applications. Surveying committee. 2022-ISBN 978-0-7844-1603-7 ISBN 978-0-7844-8422-7 (epub)
Recommended Books:	Elementary surveying. An introduction to geomatics by Ghilani C.D., Wolf P.R., PH 2011, ISBN: 0132554348.
Web Sites	https://desktop.arcgis.com/en/arcmap/latest/map/projections/transverse-mercator.htm

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO5	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√	√			
CO2				√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A5	PLO5	√					
B1	PLO11		√	√	√	√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO5	CLO1	Report	Report
B1	PLO11		CLO2	Lecture Tutorials	First, Second, and Final Exam
			CLO3	Lecture Tutorials	First, and Final Exam
			CLO4	Lecture Tutorials	Second, and Final Exam
			CLO5	Lecture Tutorials	Second, and Final Exam
			CLO6	Computer-based Instruction	Assignments

Course Coordinator: Dr. Ahmed Elsayed Abdelghafar Elhadary

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Building Construction & City Planning	**Code**	CMC307	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**2**	**0**	**3**

2. Professional Information:

2.1. Course Description:

Pr.Req. : Construction Materials (CMC 204)

Introduction, Aim & Definitions, Building Construction Stages, Wall bearing Structures: Stone construction, Masonry- raw bricks & brick masonry, Vertical circulation element: Stairs detailing, Complementary & finishing materials, Construction building types, Urban, City planning approaches & basic guidelines of the field

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	The students will be able to **apply** the engineering ethics , standards and work in the project
		CO2	Evaluate the decisions in the architectural and urban issues.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO3**	Create the architectural vocabulary and drawings

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning	CLO1	Use principles of research techniques in finishing materials
			CLO2	Apply methods of investigation in city planning approaches
A8	PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO3	Produce all necessary architectural drawings that meet technical requirements.
			CLO4	Identify communication skills effectively in all building construction stages
D1	PLO15	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies and human sciences	CLO5	Simplify architecture design problems that meet users' requirements basic guidelines of this field
			CLO6	Analyze simple urban and planning designs

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO4	CLO3,5,6	CLO1,2

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction, Aim & Definitions, Building Construction Stages	1	√			√	√	√
Introduction to Structural Systems	2	√	√				
Stone construction, Masonry-raw bricks & brick masonry	3	√					
Construction building types	4	√					
How to Draw detailed Arch. Plans & finishing materials	5	√	√	√			
How to Draw detailed Arch. Section	6	√	√	√			
First Exam	7			√			

How to Draw detailed Arch. Elevation	8,9	√	√	√			
How to Draw detailed Arch. Lay-out	10,11	√	√	√			
Second Exam	12			√			
Introduction of City Planning	13-15	√	√		√	√	√
Final exam	16			√		√	√
Total	16	**13**	**10**	**4**	**4**	**4**	**4**

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1.Lecture			√	√	√	√
2. Tutorials			√	√	√	√
3. Presentations	√	√				
4. Report	√	√				
5. Project-based Learning					√	√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	First Exam			√			
	Second Exam			√			
Reports		√	√				
Assignments					√	√	
Presentations		√	√		√	√	√
Summative Assessment Method							
Final Exam				√		√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second)Exams	7,12	50
Reports		15	2
Assignments		2,3,4,5,8,9,10,11	2
Presentations		15	6
Summative Assessment Method			
Final exam		16	40
Total			100

2.9. List of Reference:

Essential Books (Textbooks):	The Architect's Handbook of Professional Practice, American Institute of Architects, Wiley, 16th Edition, 2019
Periodicals, Web Sites, … etc:	http:// www.archnet.org http:// www.greatbuilding.com http:// www.architecture.com

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO1	√	√	
PO5			√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√				
CO2			√	√		
CO3					√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A5	PLO5	√	√				
A8	PLO8			√	√		
D1	PLO15					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO1	CLO1	• Presentations • Report	• Presentations • Report
			CLO2	• Presentations • Report	• Presentations • Reports
A8	PLO8		CLO3	• Lecture • Tutorials	• First , Second and Final Exams
			CLO4	• Lecture • Tutorials	• Presentations • Assignments
D1	PLO15	PO5	CLO5	• Lecture • Tutorials • . Project-based Learning	• Final Exams • Assignments • Presentations
			CLO6	• Lecture • Tutorials • . Project-based Learning	• Final Exams • Presentations

Course Coordinator: Dr. Ahmed Elsaadany

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Titel	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Project Management	**Code**	CMC 309	
Type	**Compulsory ☒**	**Elective ☐**		
Semester	**Fall Semester (Third Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**0**	**---**	**2**

2. Professional Information:

2.1. Course description:

Project Planning, Scheduling, and control, Project activities and network construction, Critical path method, PERT, Introduction to Resource scheduling, Project Economy. Applications in construction projects and case studies

2.2. Course Objectives (CO):

Program objective		Course objective	
PO 1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO 1**	**Apply** wide sets of project time management knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify engineering time management in real-life situations.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO 2**	**Apply** analytical, and project management skills with proficiency aided by solving management problems

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A7	PLO 7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO 1	**Discuss** the role project participants and the **planning team** who plan the project
B4	PLO 14	Deal with biddings, contracts and financial issues including project insurance and guarantees	CLO 2	**Explain** the basics of Project Planning and its techniques and how deal in the project
			CLO3	**Illustrate** the scheduling Resource and Project Economy for the project
			CLO 4	**Use** suitable software to schedule the Project
D2	PLO 16	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	CLO5	**Apply** managerial techniques to provide project alternatives time plans that represent the base of Project time management d**ecisions.**

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,3	CLO4,5	CLO1

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Concepts of Project Planning	1, 2	√	√			
Techniques of planning	3, 4		√			
Project Scheduling	5, 6		√	√	√	
First Exam	7		√	√		
Resource management	8, 9		√	√		
Time management	10			√		√
Time update and Time reduction	11					√
Second Exam	12			√		√
Applications in construction projects	13-15	√	√	√		√

and case studies						
Final Exam	16		√	√		√
Total	**16**	**5**	**11**	**8**	**2**	**5**

2.5. Lab Topics:

(Not applicable**)**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture		√	√		√
2. Tutorials		√	√		√
3. Problem-based Learning		√	√		
4. Computer-based Instruction				√	
5. Interactive Learning	√				
6.Case Study					√
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.7 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	**First Exam**		√	√		
	Second Exam			√		√
Discussion			√	√		√
Assignments			√	√	√	
Observation		√				
Summative Assessment Method						
Final Exam			√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second)Exams	7,12	50
Assignments		Every Three Weeks	5
Discussion		2,4,5,6,8,10,13,15	3
Observation			2
Summative Assessment Method			
Final exam		16	40
Total			100

2.8. List of References:

Course Notes:	Project Management ppt. by Dr Ahmed Salman
Essential Books (Textbooks):	Saleh A. Mubarak, Construction Project Scheduling and Control, Wiley & Sons, Incorporated, John; 4th edition (2019): ISBN-13: 9781119499831, ISBN-13: 1119499836
Recommended Books:	Graham Robertson "Essentials of Construction Planning and Scheduling" 4th edition, ISBN: 9780727765925, CE Publishing; Thomas Telford Ltd., (30 June, 2021)

2.9. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO 1	√	
PO 5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO 1	CLO 2	CLO 3	CLO 4	CLO5
CO 1	√	√			
CO 2			√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO 1	CLO 2	CLO 3	CLO 4	CLO5
A7	PLO 7	√				
B4	PLO 14		√	√	√	
D2	PLO 16					√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A7	PLO7	PO1	CLO 1	Interactive Learning	Observation
			CLO 2	Lecture	First , and Final Exams
				Tutorials	Assignments
				Problem-based Learning	Discussion
B4	PLO14	PO5	CLO 3	Lecture	First, Second and Final Exams
				Tutorials	Assignments
				Problem-based Learning	Discussion
			CLO 4	Computer-based Instruction	Assignments
D2	PLO16		CLO5	Lecture	Second and Final Exams
				Tutorials	
				Case Study	Discussion

Course Coordinator: Dr. Ahmed Fouad Salman *Ahmed Salman*

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Technical Installations in Buildings	**Code**	CMM308	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	0	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Fundamental of Thermal Engineering (CMM 210)

Thermal Comfort Heating. Ventilation & Air Conditioning. (HVAC), Central heating & Cooling Systems, Distribution Media, and Delivery Devices. Heat and Moisture Transfer in Buildings, Lighting On-site power generation, and Normal electrical systems. Special systems. Water supply & Drainage systems, types of fixtures, private sewerage systems, Fire protection systems, Architectural acoustics

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a broad spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations	**CO1**	**Illustrate** the concept of Ventilation & Air Conditioning. (HVAC), lighting and electrical generation, Fire protection, and Plumbing works.
		CO2	**Evaluate** a wide spectrum of Electrical and mechanical Installations systems components with analytics and solve engineering problems in distribution power systems
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO3**	**Design** of Electrical and mechanical System Requirements for installations in buildings

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO1**	**Classify** the different air conditioning systems and equipment to be designed and selected during AC system design stages.
A10	**PLO10**	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**CLO2**	**Illustrate** the basic principles and concepts of electrical and mechanical installations in buildings
B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	**Select** appropriate for the construction of electrical and mechanical installation; using either numerical techniques or physical measurements
			CLO4	**Analyze** the elementary subsystems included at different air conditioning systems such as: air distribution system, and chilled water circuits for central air conditioning systems, and the refrigerant piping systems for refrigeration plant.
D1	**PLO15**	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies and human sciences	**CLO5**	**Explain** the parameters affecting the performance of installation balding to propose improvements.
			CLO6	**Design** construction of electrical and mechanical installations in buildings engineering techniques and project management skills with proficiency aided by modern tools.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,5	**CLO3,4,6**	**CLO1**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to Power distribution system	**1**	√					
Electrical load estimation	**2**		√	√	√		
Circuit breaker	**3**					√	√
Generator and transformer	**4**			√		√	
Cables, Lighting	**5,6**			√		√	√
First Exam	**7**		√	√			√
Introduction to Air Conditioning Systems	**8**	√					
Classification of Air Conditioning Systems	**9**				√		
All Air Systems and Air side equipment	**10**		√		√		
Air Conditioning Systems load estimation	**11**		√		√		√
Second Exam	**12**				√		√
Basic parts of the fire-fighting systems and Waterside Equipment	**13**	√					
Fire-fighting systems and Equipment	**14,15**			√		√	√
Final Exam	**16**			√	√	√	√
Total		**3**	**3**	**6**	**4**	**6**	**6**

2.6. Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lecture			√	√	√	√
2. Tutorials			√	√	√	√
3. Project-based Learning		√			√	
4. Report	√	√	√	√		
5. Discussion		√	√	√	√	
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						
4. Program Software						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	Oral Test	√	√	√	√	√	
	First Exam		√	√			√
	Second Exam				√		√
Reports		√	√	√	√		
Summative Assessment Method							
Final Exam				√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second)Exams	7,12	50
	Oral Test	15	5
Reports		3,4,6,14	5
Summative Assessment Method			
Final exam		16	40
Total			100

2.9. List of Reference:

Course Notes:	Available lecture notes are shared with the students
Essential Books (Textbooks):	1- Refrigeration Systems and Applications, I. Dincer, Wiley, 3rd Edition, 2018. 2- Basic Refrigeration and Air Conditioning by Ananthanarayanan McGraw Hill, 2013. 3- Brian Scaddan: “Electrical Installation Work” tenth Edition,2022
Recommended Books:	1- ASHARE, HVAC Systems and Equipment Handbook, 2020. 2- ASHARE, HVAC Application Handbook, 2019. 3- Building Technology: Mechanical and Electrical Systems- Architecture by Benjamin Stein, John Wiley & Sons, 2010

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO1	√	√	
PO5			√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√				
CO2			√	√		
CO2					√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A5	PLO5	√					
A10	PLO10		√				
B1	PLO11			√	√		
D1	PLO15					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO1	CLO1	• Report	• Oral Test • Reports
A10	PLO10		CLO2	• Project-based Learning • Report • Discussion	• Oral Test • Reports • First Exams
B1	PLO11	PO5	CLO3	• Lecture • Tutorials • Report • Discussion	• First and Final Exam • Reports • Oral Test
			CLO4	• Lecture • Tutorials • Report • Discussion	• Second and Final Exam • Reports • Oral Test
D1	PLO15	PO5	CLO5	• Lecture • Tutorials • Project-based Learning • Discussion	• Final Exam • Oral Test
			CLO6	• Lecture • Tutorials	• First, Second and Final Exam

Course Coordinator: **Ass. Prof. Fawzy Ahmed Mohamed Osman**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Numerical Methods		**Code**	**FRB301**
Type	**Compulsory ☒**	**Elective ☐**		
Semester	**Fall Semester (Third level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**2**	**0**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Mathematics III (FRB201)

linear and quadratic equations, functions of a single variables, solution of systems of linear equations, solution of linear systems by elimination, Elementary introduction to linear programming, convex sets, maxima, and minima of linear functions. Problems of maximizing or minimizing a linear function to linear constraints, linear Programming problems, Numerical solution of differential equations, mathematical preliminaries, Simple difference equations, Euler method, Runge-Kutta methods, Systems of linear equations, introduction, properties of matrices, diagonal and triangular matrices, the numerical solution of linear systems, The pivoting strategy, introduction, properties, and the numerical methods.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Explain** a philosophy of numerical analysis, the concepts of linear programming, and its applications with specialized skills.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles. solve engineering problems in real-life situations.	**CO2**	**Select** a suitable item to evaluate applied engineering problems in **real-life situations.**

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	**Identify** the basic items of the course.
			CLO2	**Explain** how to use all items of the course in applied engineering problems
A2	PLO2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	CLO3	**Evaluate** the suitable solution methods for various mathematics elements
			CLO4	**Analyze** the different problems and verifications

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
1.Introduction	1	√	√		
2.Elementary introduction to linear programming, convex sets, maxima, and minima of linear functions	2	√	√		
3.Problems of maximizing or minimizing a linear function to linear constraints, linear Programming problems	3		√		√
4.Solution of Linear Equations. General Iterative Methods: Ritz–Jacobi. Convergence conditions & Truncation Error.	4	√			
5.General Iterative Methods: Gauss-Seidel Methods. Convergence conditions & Truncation Error.	5	√	√		√
6.Solution of Non-Linear Equations. The	6	√	√		

General Iterative Methods, Newton-Raphson Iterative Method					
7.First Exam	**7**	√	√		√
8.Approximation of Functions, Curve Fitting, Polynomial Interpolation, Lagrange Interpolation	**8**	√	√		
9.Polynomial Interpolation, Newton's Interpolation, Divided and equal Differences, Hermite Interpolation	**9**	√		√	√
10. Numerical Differentiation, Numerical Integration, Trapezoidal Rule	**10**	√			√
11. Simpson's Rule, Romberg – Steifel	**11**		√	√	
12. Second Exam	**12**	√	√	√	√
13. Numerical solutions for Ordinary Differential Equations (Picard's Method, Euler Methods)	**13**	√	√	√	
14. Runge – Kutta Method	**14**		√	√	
15. Parabolic Problem Classical Explicit Method, Stability and Truncation Error Parabolic Problem (Crank-Nicolson Implicit Method)	**15**	√			√
16. Final Exam	**16**	√	√	√	√
Total	**16**	**10**	**9**	**4**	**5**

2.6. Lab Topics:

Not applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture	√	√	√	√
2. Tutorials	√	√	√	√
3. Problem-based Learning		√	√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**	√	√		√
	Second Exam	√	√	√	√
Discussion		√	√	√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exams**	7	30 %
	Second Exams	12	20 %
Discussion		3,6,9,11	10 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	https://www.math.hkust.edu.hk/~machas/numerical-methods.pdf
Essential Books (Textbooks):	1. Operations Research An Introduction, Tenth Edition, Global Edition, Hamdy A. Taha, **2017**,(ISBN 13: 978-1-292-16554-7 2. Applied Engineering Analysis, Tai-Ran Hsu, published by John Wiley & Sons**, 2018** (ISBN 97811119071204)
Periodicals, Web Sites, … etc:	**1. https://byjus.com** **2. https://ncert.nic.in**

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A1	PLO1	√	√		
A2	PLO2			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Lecture • Tutorials	• First, Second and Final Exams
			CLO2	• Lecture • Tutorials	• First, Second , and Final Exams
				• Problem-based Learning	• Discussion
A2	PLO2	PO2	CLO 3	• Lecture • Tutorials	• Second , and Final Exams
				• Problem-based Learning	• Discussion
			CLO4	• Lecture • Tutorials	• First, Second , and Final Exams

Course Coordinator: **Ass Prof. Mohamed Abdel Fattah Elsisy**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Probabilities & Statistics	**Code**	FRB 302	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	0	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Mathematics III (FRB 201)

Probability theory. Events. Conditional probability. Bays Theory. Random variables. Mathematical expectation. Discrete and continuous probability density functions. Transformation of variables. Probabilistic models, statistics, and elements of hypothesis testing (sampling distributions and interval estimation). Introduction to statistical quality control. Applications to engineering problems.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	**Apply** a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and **solve** engineering problems in real-life situations.	**CO1**	Apply the principal concepts of probability and statistics in engineering projects.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	Formulate theorems about the concept of probability and statistics.

2.3. Course Learning Outcomes (CLOs):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	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.	CLO1	**Apply** key concepts of probability
			CLO2	**Explain** the different statistical distributions
			CLO3	**Generate** different problem-solving techniques needed to accurately calculate probabilities
A2	PLO2	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.	CLO4	**Demonstrate** the concepts of estimation and properties of estimators.
			CLO5	**Use** standard software (e.g., R-Programming) to facilitate statistical analysis

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4,5	

2.5. Course Topics:

Course Topics	Week	CLO1	CLO2	CLO3	CLO4	CLO5
The probability spaces.	1	√				
Conditional probability.	2,3	√				
Probability functions and distributions.	4		√			
Basic theorems.	5		√	√		
Discrete and continuous distributions.	6	√		√		
First Exam	7	√	√	√		
Statistical estimation.	8,9		√		√	
Tests of hypotheses.	10,11			√		√
Second Exam	12	√	√	√		
Tests of hypotheses.	13-15			√		√
Final Exam	16	√	√	√		
Total	**16**	**4**	**4**	**7**	**2**	**5**

2.6. Lab Topics:

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
1. Lecture	√	√	√		
2. Tutorials	√	√	√		
3. Discussion				√	
4. Problem-based Learning			√		
5. Computer-based Instruction					√
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method						
Tests	**Quizzes**	√	√	√		
	First Exam	√	√	√		
	Second Exam	√	√	√		
Discussion				√	√	
Assignments						√
Summative Assessment Method						
Final Exam		√	√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
	Quizzes	4,6,11,12	2%
Discussion		5,6,10-11,13,14	3 %
Assignments		10,11,13-15	5 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	• advanced engineering mathematics 10th editionlectures (2019)
Recommended Books:	• advanced engineering mathematics 10th edition (2018)

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives	
	CO1	CO2
PO1	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√	√			
CO2			√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A1	PLO1	√	√	√		
A2	PLO2				√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
A1	PLO1	PO1	CLO1	Lecture	First, Second, and Final Exams
				Tutorials	Quizzes
			CLO2	Lecture	First, Second, and Final Exams
				Tutorials	Quizzes
		PO5	CLO3	Lecture	First, Second, and Final Exams
				Tutorials	Quizzes
				Problem-based Learning	Discussion
A2	PLO2		CLO4	Discussion	Discussion
			CLO5	Computer-based Instruction	Assignments

Course Coordinator: **Dr. Mohamed Reda Ali** mohamed

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Human Resource Management		**Code**	**HS302**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**0**	**0**	**2**

2. Professional Information:

2.1. Course description:

Recruitment and maintenance of the labor force within an organization, Tools and techniques, Selection, Training and Development, Performance appraisal, Wage and salary administration, Unions, Human resource planning and forecasting.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields	**CO1**	Rank the tasks and practices of human resource management, whether on a strategic, tactical or operational level
		CO2	Create the career path of employment and understand performance appraisal systems and wage and incentive policies.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A4	PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO 1	Solve issues and propose solutions to human resource issues through case studies and brainstorming
			CLO 2	Manage career paths for employment and realize how to achieve the quality life work, Through effective evaluation of employee performance
			CLO 3	Compose the basics of human resource management as strategies, policies, and executive, which later qualifies them to manage the human element in their organizations effectively
			CLO 4	Identify the nature of human resource outsourcing services and their multiple classifications, in addition to introducing them to the scientific and applied foundations of talent management., and electronic human resource management.
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO 5	Use research techniques and methods of investigation to write about electronic human resource management.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO4	CLO1,2,3,4	CLO5

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Strategic Human Resource Management.	1				√	
Human Resource Practices.	2				√	
Career Path Planning and Development.	3,4	√	√			

Employee Performance Appraisal.	5,6		√			
First Exam	7	√	√		√	
Outsourcing Human Resource Services.	8	√		√	√	
Electronic Human Resource Management.	9-11	√		√	√	√
Second Exam	12	√		√	√	
Talent Management.	13				√	
Quality of Work Life	14,15		√			
Final Exam	16	√	√	√	√	
Total	**16**	**6**	**6**	**4**	**7**	**3**

2.6 Lab Topics

N.A

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√	√	√	√	
2. Discussion			√	√	
3. Brain Storming	√				
4. Case Study	√				
5. Problem-based Learning		√			
6. Report					√
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	**First Exam**	√	√		√	
	Second Exam	√		√	√	
Discussion		√	√	√	√	
Report						√
Presentation						√
Observation		√	√			
Summative Assessment Method						
Final Exam		√	√	√	√	

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Discussion		3,6,8,9	2%
Report		15	3%
Presentation		15	3%
Observation		8-11	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	د. مروة محمد عبد الحميد ، إدارة الموارد البشرية الاستراتيجية : مدخل لادارة المواهب وجودة الحياة الوظيفية ، المؤلف، القاهرة، 2022م
Recommended Books:	أ.د. أحمد سيد مصطفى ، إدارة الموارد البشرية: الإدارة العصرية لرأس المال الفكرى، المؤلف، القاهرة، 2005م
Periodicals, Web Sites, … etc:	Human Resource Management Magazine

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO4	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√			√	√
CO2		√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A4	PLO4	√	√	√	√	
A5	PLO5					√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO 4	PO4	CLO1	Lecture	First, Second and Final Exam
				Brain Storming	Observation
				Case Study	Discussion
			CLO2	Lecture	First, and Final Exam
				Problem-based Learning	Discussion
			CLO3	Lecture	Second and Final Exam
				Discussion	Discussion
			CLO4	Lecture	First, Second and Final Exam
				Discussion	Discussion
A5	PLO 5		CLO5	Report	Report Presentations

Course Coordinator: Dr. Marwa Abd-El Hameid د.مروة عبدالحميد

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Strategic Management		**Code**	**HS304**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**0**	**0**	**2**

2. Professional Information:

2.1. Course description:

Analytical methods for strategic management, Factors characterizing and encouraging innovation, Managing and integrating new technology into the strategic process, Case studies analyzing and demonstrating the several elements of strategic management of technology.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields	**CO1**	Formulate new strategies for strategic management exploiting international business opportunities
		CO2	Present strategic decisions that have ethical challenges and make appropriate recommendations for ethical decision-making.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines,	**CLO 1**	Identify the strategic decisions that organizations make and that have an ability to engage in strategic planning.

		health and safety requirements, environmental issues and risk management principles.	**CLO 2**	Explain the basic concepts, principles and practices associated with strategy formulation and implementation.
A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO 3**	Use research techniques and methods of investigation to write about strategic management of technology.
			CLO 4	Evaluate critically real life company situations and develop creative solutions, using a strategic management perspective. using methods of investigation .

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2		**CLO3,4**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to methods for strategic management	1	√	√		
Analytical methods for strategic management	2		√		
Factors characterizing and encouraging innovation	3	√			
Managing new technology into the strategic process	4,5		√		
Integrating new technology into the strategic process	6	√	√		
First Exam	7	√	√		
demonstrating the several elements of strategic management of technology.	8,9	√	√		
Case studies analyzing and demonstrating the several elements of strategic management of technology.	10,11			√	√
Second Exam	12	√	√	√	√
Case studies analyzing and demonstrating the several elements of strategic management of technology.	13-15			√	√
Final Exam	16	√	√		
Total	**16**	**5**	**7**	**5**	**5**

2.6. Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√		
2. Discussion	√	√		
3. Case study			√	√
4. Report			√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**	√	√		
	Second Exam	√	√		
Discussion		√	√	√	√
Report				√	√
Presentation				√	√
Summative Assessment Method					
Final Exam		√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Discussion		2-6,10-11,13-14	4%
Report		15	3%
Presentation		15	3%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	Strategic Management, Kennedy B. Reed, Virginia Tech, 2020, ISBN 13: 9781949373950
Recommended Books:	Grant, R. and Jordan, J. 2012. Foundations of Strategy. NY: John Wiley &Sons, Ltd

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO4	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1			√	√
CO2	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A4	PLO4	√	√		
A5	PLO5			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO 4	PO4	CLO1	Lecture	First, Second and Final Exam
				Discussion	Discussion
			CLO2	Lecture	First, Second and Final Exam
				Discussion	Discussion
A5	PLO 5		CLO3	Report	Report Presentations
				Case study	Discussion
			CLO4	Report	Report Presentations
				Case study	Discussion

Course Coordinator: Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Computers and Society		**Code**	**HS306**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Third Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**0**	**0**	**2**

2. Professional Information:

2.1. Course description:

History of computing and the information industry, Social context of computing, Economic issues in computing Intellectual property, Copyright, patents, trade secrets issues, Professional and ethical responsibilities, Codes of ethics, Current trends of computer applications in industry and management, Impact of information revolution on the society, e-society, e-business, e-commerce and e-government.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields	**CO1**	Study human-computer interaction issues and their impacts on different IT-enhanced sectors
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools	**CO2**	Discuss the impact of the computer revolution on the conditions of work and life in contemporary society such as the usage of social networking sites;

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements,	**CLO 1**	Describe current trends in computing technology that shapes our society
			CLO 2	Examine the historical perspectives of critical moments in computer science.

		environmental issues and risk management principles.	**CLO 3**	Explain the benefits and risks of computational advancements and explore how they cause changes in our day-to-day lives and society
A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO 4**	Use research techniques and methods of investigation to write about Impact of information revolution on the society.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2,3		**CLO4**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
History of computing and the information industry	1		√		
Social context of computing	2	√	√		
Economic issues in computing Intellectual property	3	√			
Copyright, patents, trade secrets issues	4,5		√		
Professional and ethical responsibilities	6	√	√		
First Exam	7	√	√		
Codes of ethics	8			√	
Current trends of computer applications in industry and management	9		√	√	
e-society, e-business, e-commerce, and e-government.	10,11			√	
Second Exam	12		√	√	
Impact of information revolution on the society	13-15				√
Final Exam	16	√	√	√	
Total	**16**	**3**	**6**	**4**	**3**

2.6. Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√	√	
2. Discussion			√	
3. Presentation				√
4. Report				√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**	√	√		
	Second Exam		√	√	
Discussion				√	
Report					√
Presentation					√
Summative Assessment Method					
Final Exam		√	√	√	

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Discussion		8-11	4%
Report		15	3%
Presentation		15	3%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	Computers and Society-Modern Perspectives, Ronald M. Baecker, 2019, ISBN: 9780198827092
Recommended Books:	Computers and Society, Lisa C. Kaczmarczyk, 2012, ISBN 9781439810880

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO4	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A4	PLO4	√	√	√	
A5	PLO5				√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO 4	PO4	CLO1	Lecture	First, Second and Final Exam
			CLO2	Lecture	Second and Final Exam
		PO5	CLO3	Lecture	Second and Final Exam
				Discussion	Discussion
A5	PLO 5		CLO4	Report	Report
				Presentation	Presentations

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management				
Department Offering the course	Construction Engineering and Management				
Date of Specification Approval	**5/9/2023**				
Course Title	Accounting			**Code**	**HS308**
Type	**Compulsory** ☐		**Elective** ☒		
Semester	Spring Semester (Third Level)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**	
	2	**0**	**0**	**2**	

2. Professional Information:

2.1. Course description:

Basic accounting concepts: Accounting Terms and Assumptions, Accounting Methodology: balance sheet, income statement, cash flow statement. Income Determination: Cash Effects, Basis of Accounting. Accounting ratio – measuring the performance – cost concepts – cost accumulation – cost allocation – cost/volume/profit analysis – budgets – forecasting - Cost Accounting.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields	**CO1**	Analyze the income statements under absorption costing and variable costing and show the reasons for the variations as a group or individual level

2.3. Course Learning Outcomes (CLO's):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO 1**	Describe the system of accounting standards and principles.
			CLO 2	Analyze financial statements utilizing horizontal and vertical analysis and ratio analysis

A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO 3**	Use research techniques and methods of investigation to write about accounting cycle.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1	**CLO2**	**CLO3**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered		
		CLO1	CLO2	CLO3
Basic accounting concepts	1-3	√		
Accounting Methodology	4-6	√		
First Exam	7	√		
Income Determination	8		√	
Accounting ratio – measuring the performance	9		√	
cost concepts – cost accumulation – cost allocation	10,11		√	
Second Exam	12		√	
cost/volume/profit analysis – budgets – forecasting - Cost Accounting.	13		√	
Accounting cycle	14-15			√
Final Exam	16	√	√	
Total	**16**	**6**	**5**	**4**

2.6. Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered		
	CLO1	CLO2	CLO3
1. Lecture	√	√	
2. Discussion		√	
3. Presentation			√
4. Report			√
Teaching and Learning Methods for Students with Special Needs:			
Methods			
1. Discussion Session			
2. Extra Lectures			
3. Provide different levels of books and materials			

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered		
		CLO1	CLO2	CLO3
Formative Assessment Method				
Tests	**First Exam**	√		
	Second Exam		√	
Discussion			√	
Report				√
Presentation				√
Summative Assessment Method				
Final Exam		√	√	

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Discussion		8-11	4%
Report		15	3%
Presentation		15	3%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	Anthony A.Atkinson, Robert S.Kaplan, E. M. Matsumura and S.Mark Young, Management Accounting: Information for Decision Making and Strategy Execution (6th edition) 2017, ISBN-13: 9781292166001
Recommended Books:	Weetman, P. (2010). Management Accounting. 2nd Edition. Financial Times Press. ISBN13: 9780273718451 ISBN10: 0273718452

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective
	CO1
PO4	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes		
	CLO1	CLO2	CLO3
CO1	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes		
		CLO1	CLO2	CLO3
A4	PLO4	√	√	
A5	PLO5			√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO 4	PO4	CLO1	Lecture	First, and Final Exam
			CLO2	Lecture	Second and Final Exam
				Discussion	Discussion
A5	PLO 5		CLO3	Report	Report
				Presentation	Presentations

Course Coordinator: Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Design of Metallic Structures-1		**Code**	**CMC401**
Type	**Compulsory ☒**	**Elective ☐**		
Semester	Fall Semester (Fourth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Structural Analysis-2 (CMC 202)

Construction materials - Design criteria and considerations - Design loads of steel structures - Allowable stresses - Design of tension members - Stability of steel structures against lateral loads - Bracing systems - Column buckling - Design of axially compressed members - Design of bracing members - Design of laterally supported beams - Lateral torsional buckling of beams - Design of laterally unsupported beams - Design of beam-columns - Frames and trusses - Design of bolted and welded connections - Column bases.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Apply a structural analysis methods to get a critical cases for design steel element.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	Design of steel elements according to standard codes.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A3	PLO3	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.	CLO1	Apply specified consideration to planning the steel structure.
			CLO2	Apply of different loads, structural analysis of steel structure.
A4	PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO5	Derive safety of actual stresses by compare it by allowable stresses of codes and standards of steel structures.
			CLO6	Derive safety requirements (serviceability &deflection) by compare it by limits of codes and standards of steel structures.
B2	PLO12	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.	CLO3	Determine the critical straining action for elements.
			CLO4	Design of Steel Structure elements achieving an optimum design.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Construction materials , Design criteria and considerations	**1**	√	√				
Loads on steel structures	**2**	√	√	√			
Allowable stresses - Design of tension members	**3**	√	√	√			
Design of axially compressed members	**4**	√			√		
Design of laterally supported beams	**5,6**				√		
First Exam	**7**	√	√		√		
Lateral torsional buckling of beams - Design of laterally unsupported beams	**8**				√	√	√
Design of beam-columns	**9**				√	√	
Design of welded connections	**10**				√	√	
Design of bolted connections (bearing type)	**11**				√	√	√
Second Exam	**12**			√	√	√	√
Design of bolted connections (friction type)	**13-15**			√	√	√	√
Final Exam	**16**	√			√	√	√
Total	**16**	**4**	**3**	**4**	**9**	**6**	**4**

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lecture	√	√	√	√		
2. Tutorials				√	√	√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	Quiz	√			√	√	√
	First Exam	√	√		√		
	Second Exam			√	√	√	√
Assignments		√	√	√	√	√	√
Summative Assessment Method							
Final Exam		√			√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First exam**	7	30
	Second exam	12	20
Quiz		5,9,11	7
Assignments		4,6,10,11,13	3
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	- Staff lectures notes
Essential Books (Textbooks):	1- Egyptian code for design of steel structure (ASD). 2- Steel structures design by Prof Dr. Abdelrahim Khalil Dessouki, ISBN: 977-5423-65-1, (2018).
Recommended Books:	Steel design hand book by. Prof Dr. Bahaa M. Mashaly Part 1. Seventh Edition, ISBN: 977-223-549-8.
Periodicals, Web Sites, … etc:	

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

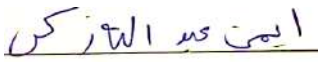
Course Objectives	Course Learning Outcomes					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
CO1	√	√	√			
CO2				√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
PLO3	√	√				
PLO4					√	√
PLO12			√	√		

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO3	PO1	CLO1	• Lecture.	• First and Final Exams. • Assignments, Quiz.
		CLO2	• Lecture.	• First Exam. • Assignments
PLO4	PO5	CLO5	• Tutorials.	• Second, and Final Exams. • Assignments, Quiz.
		CLO6	• Tutorials.	• Second, and Final Exams. • Assignments, Quiz.
PLO12	PO5	CLO3	• Lecture.	• Second Exam. • Assignments
		CLO4	• Lecture. • Tutorials.	• First, second, and Final Exams. • Assignments, Quiz.

Course Coordinator: **Dr. Ayman Abd-allah Zaky** 

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen** 

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Design of Metallic Structures-2		**Code**	**CMC402**
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (Fourth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	**3**

2. Professional Information:

2.1. Course Description:

Pr.Req. : Design of Metallic Structures-1 (CMC 401)

Introduction to cold-formed sections. Design of cold formed sections. Industrial buildings – Cranes – Tall buildings – Long span structures – Introduction to load and resistance factor design and ultimate design. Plastic analysis of Structures. Behavior of steel frames. Design of Plate girders.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Apply an engineering knowledge to get a critical cases for design a steel structure.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	Design of the thin-walled steel according to Egyptian code.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A3	PLO3	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.	CLO1	Apply specified consideration to understand composite sections and its properties.
			CLO2	Apply specified consideration to understand properties of slender sections.
A4	PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO5	Utilize codes of practice and standards of steel structural to check the allowable stresses.
			CLO6	Utilize codes of practice and standards of steel structural to check safety requirements (serviceability &deflection)
B2	PLO12	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.	CLO3	Calculate the critical straining action for elements.
			CLO4	Design of Steel Structure elements.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2		CLO3,4

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to cold-formed sections	**1**	√	√				
Design of cold formal sections	**2,3**	√	√	√			
Behavior of steel frames	**4,5**			√			
Industrial buildings (composite beam)	**6**				√		
First Exam	**7**		√	√	√		
Industrial buildings (composite column)	**8**				√	√	
Introduction to load and resistance factor design and ultimate design.	**9**				√	√	
Ultimate design. (Tension members)	**10**				√	√	√
Ultimate design. (Compression members)	**11**				√	√	√
Second Exam	**12**		√	√	√	√	
Ultimate design. (Beam design)	**13,14**			√	√	√	√
Final Exam	**16**	√			√	√	√
Total	**16**	**3**	**3**	**6**	**7**	**6**	**4**

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lecture	√	√	√	√		
2. Tutorials				√	√	√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	Quiz	√			√	√	√
	First Exam		√	√	√		
	Second Exam		√	√	√	√	
Assignments					√	√	√
Summative Assessment Method							
Final Exam		√			√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First and Second Exams	7,12	50
	Quiz	5, 9,11	7
Assignments		4,6,10,11,13	3
Summative Assessment Method			
Final exam		16	40
Total		16	100

2.9. List of Reference:

Course Notes:	- Staff lectures notes
Essential Books (Textbooks):	1- Egyptian code for design of steel structure (ASD). 2- Egyptian Code of Practice for Steel Construction (LOAD and RESISTANCE FACTOR DESIGN), (LRFD). 3- Steel structures design by Prof Dr. Abdelrahim Khalil Dessouki, ISBN: 977-5423-65-1, (2018).
Recommended Books:	Steel design hand book by. Prof Dr. Bahaa M. Mashaly Part 1. Seventh Edition, ISBN: 977-223-549-8.
Periodicals, Web Sites, … etc:	

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√	√			
CO2				√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A3	PLO3	√	√				
A4	PLO4					√	√
B2	PLO12			√	√		

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A3	PLO3	PO1	CLO1	• Lecture.	• Final Exam. • Quiz.
			CLO2	• Lecture.	• First, and second exams.
A4	PLO4	PO5	CLO5	• Tutorials.	• Second, and Final Exams. • Assignments, Quiz.
			CLO6	• Tutorials.	• Final Exam. • Assignments, Quiz.
B2	PLO12		CLO3	• Lecture.	• First, and second exams.
			CLO4	• Lecture. • Tutorials.	• First, second, and Final Exams. • Assignments, Quiz.

Course Coordinator: **Dr. Ayman Abd-allah Zaky** ايمن عبد الله زكى

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Environmental & Sanitary Engineering	**Code**	CMC 403	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Fourth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	0	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Hydraulics for Civil Engineer (CMC 301)

Sources of pollution, Water resources and characteristics, Water quality, Water collection works, Water purification works, Water distribution works, Sewer systems, Wastewater characteristics, Wastewater treatment works, Wastewater disposal works, Treated wastewater reuse, Industrial wastes.

.2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	**Apply** a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and **solve** engineering problems in real-life situations.	**CO1**	Illustrate Sources of pollution, Water resources and characteristics which used as concept for water treatment.
PO5	Apply analytical, **experimental**, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	Design the different units of WTP, WWTP the water distribution system and Wastewater gravity system.

2.3. Course Learning Outcomes (CLOs):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A2	PLO2	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.	CLO1	Discuss the concepts of environmental pollution, Water resources and water characteristics
B3	PLO13	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.	CLO2	Apply knowledge of environmental impact assessment and sustainability.
D2	PLO16	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	CLO3	**Design of** Water collection works, Water purification works and Wastewater treatment works.
			CLO4	**Use** different methods for planning Water distribution works and Sewer systems.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1	CLO 2,3,4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
1. Introduction to Environmental engineering	1	√	√		
2. Water supply (Population & Water Consumption)	2,3		√		
3. Collection Works for Surface Water	4			√	
4. Sedimentation	5,6			√	
5. First Exam	7		√	√	
6. Disinfection	8			√	
7. storage	9			√	
8. Design of Water Distribution System	10,11				√

9. Second Exam	12			√	√
10. Sewer System	13				√
11. Wastewater Treatment and disposal	14,15			√	
12. Final Exam	16	√	√	√	√
Total	**16**	**1**	**3**	**7**	**3**

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture		√	√	√
2. Tutorials		√	√	√
3. Discussion	√	√		√
4. Presentation		√		
Teaching and Learning Methods for Students with Special Needs				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**Quizzes**			√	√
	First Exam		√	√	
	Second Exam			√	√
Discussion		√	√	√	√
Assignments			√	√	
Summative Assessment Method					
Final Exam		√		√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
	Quizzes	4,6,11,12	5 %
Discussion		3,5,8,10,13	2.5 %
Assignments		Every week	2.5 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	• Sanitary Engineering Prof. Mohamed Basiouny (2019) • Pollution & society Prof. Mohamed Basiouny (2019)
Essential Books (Textbooks):	• Water and Wastewater Technology: Pearson New International Edition ISBN-13: 9781292021041 • شبكات المياه - الكود المصرى (2019) • محطات تنقية مياه الشرب - الكود المصرى- (2019) • محطات الرفع - الصرف الصحى- الكود المصرى (2019) - • أعمال المعالجة- الصرف الصحى - الكود المصرى-(2019)

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives	
	CO1	**CO2**
PO1	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A2	PLO2	√			
B3	PLO13		√		
D2	PLO16			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
A2	PLO2	PO1	CLO1	Discussion	Discussion
B3	PLO13	PO5	CLO2	Lecture	First and Final Exams
				Tutorials	Quizzes
				Discussion	Discussion
				Presentation	Discussion
D2	PLO16	PO5	CLO3	Lecture	First , Second and Final Exams
				Tutorials	Quizzes
			CLO4	Lecture	Second and Final Exams
				Tutorials	Quizzes
				Discussion	Discussion

Course Coordinator: **Dr. Osama Abdelaziz Abosiada**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Design of Hydraulic Structures	**Code**	CMC404	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**Spring Semester (Forth Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	0	3

2. Professional Information:

2.1. Course description:

Pr.Req. : Hydraulics for Civil Engineer (CMC 301)

Design of water crossing structures (Culverts, Siphons). Hydraulic and Structural design. Design of Weirs and escapes. Design of Regulators and Barrages. Design of navigation locks. Types of dams, design of concrete and earth dams, Spillways of dams. Pump stations

2.2. Course Objectives (CO):

Program objective		Course objective	
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO1**	**Classify** the irrigation structures, the types of Retaining walls and the loads for different cases of loading on irrigation structures
		CO2	**Design** Crossing and navigation structures as Small R.C. bridges, Culverts, Syphons, Aqueducts, Escapes works and locks.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A3	**PLO3**	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global,	**CLO1**	Apply engineering principles in the fields of planning and designing of irrigation projects.

		cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**CLO2**	Calculate the heading up of the irrigation works
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO3**	Construct adequate water control structures, irrigation networks, and pumping stations.
			CLO4	**Analyses** the system or structure according to the code of practices.
B2	**PLO12**	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.	**CLO5**	**Design** the irrigation works as the tail escape, culvert, syphon, and bridges
			CLO6	**Design** the Navigation works as (locks).
D2	**PLO16**	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of structural design, construction, technology, and engineering problems	**CLO7**	**Design** the different types of retaining walls
			CLO8	Calculate of loads for different cases of loading for irrigation structure

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4,5,6,7,8	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Introduction	1	√					√	√	
Design of Tail escape	2	√				√			
Design of Box Culvert	3	√	√		√	√			√
Design of Box Culvert	4	√	√		√	√			√
Design of Pipe Culvert	5	√	√		√	√			√
Design of Box Syphon	6	√	√		√	√			√
First Exam	7	√	√	√	√	√			√
Design of Pipe Syphon	8	√		√	√	√			√
Design of Box aqueduct	9	√		√	√	√			√
Design of Pipe aqueduct	10	√	√	√	√	√	√		√
Design of Bridges	11	√	√		√	√	√	√	√
Second Exam	12	√	√	√	√	√	√		√
Design of Retaining Walls	13		√		√	√	√		√
Design of Regulators	14						√	√	√
Design of Navigation structures	15		√				√		
Final Exam	**16**	√	√	√	√	√	√	√	√
Total	**16**	**13**	**11**	**6**	**12**	**13**	**8**	**4**	**13**

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
1. Lectures	√	√	√	√	√	√	√	√
2. Tutorials	√		√		√			√
3. Presentations	√	√		√		√	√	
4. Co-operative Learning							√	√
Teaching and Learning Methods for Students with Special Needs:								
Methods								
1. Repeat the explanation of some of the material and tutorials.								
2. Give them specific tasks and assign a teaching assistance to follow up the performance of this group of students.								
3. Provide different levels of books and materials								

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Formative Assessment Method									
Tests	**First Exam**	√	√	√	√	√			√
	Second Exam			√	√	√			√
	Quizzes	√	√	√		√			√
Mini Projects		√	√		√		√	√	√
Presentations		√	√		√		√	√	
Summative Assessment Method									
Final Exam		√	√	√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second)Exams	7,12	50
Mini projects		10	5%
Presentations		2,9	2%
Quizzes		At end of each topic	3%
Summative Assessment Method			
Final exam		16	40
Total		16	100

2.9. List of References:

Recommended Books:	-Irrigation and Drainage Principle (Dr. Sharl Irrigation Engineering and Hydraulic Structures by Santosh Kuma- By Easy Engineering, 2012 -Hydraulic Design Handbook by Larry W Mays, McGraw-Hill Professional, First Edition, 1999.

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO5	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
CO1	√	√						√
CO2			√	√	√	√	√	

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
A3	PLO3	√	√						
A4	PLO4			√	√				
B2	PLO12					√	√		
D2	PLO16							√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A3	PLO3	PO5	CLO1	Lectures	First , and Final exams
				Tutorials	Quizzes
				Presentations	Mini projects Presentation
			CLO2	Lectures	First ,Second and Final exams
				Presentations	Mini projects Presentation
A4	PLO4		CLO3	Lectures	First ,Second and Final exams
				Tutorials	Quizzes
			CLO4	Lectures	First ,Second and Final exams
				Presentations	Mini projects Presentation
B2	PLO12		CLO5	Lectures	First ,Second and Final exams
				Tutorials	Quizzes
			CLO6	Lectures	Final exam
				Presentations	Mini projects Presentation
D2	PLO16		CLO7	Lectures	Final exam
				Presentations	Presentations
				Co-operative Learning	Mini projects
			CLO8	Lectures	First ,Second and Final exams
				Tutorials	Quizzes
				Co-operative Learning	Mini projects

Course Coordinator: **Dr. Amir Sabry Ibrahim**

Head of Department: **Dr. Ahmed Youssef Kamaldeen El**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Construction Management	**Code**	**CMC 405**	
Type	**Compulsory ☒**	**Elective ☐**		
Semester	**Fall Semester (Fourth Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	1	**2**	**---**	**2**

2. Professional Information:

2.1. Course description:

Pr.Req. : Project Management (CMC 309)

Introduction to construction management, project life cycle, responsibilities and relationships of construction project partners, legal organizational structure, contractual relationships, project team work, introduction to value engineering, safety and health in construction.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO 1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO 1**	**Apply** wide sets of project management knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and manage construction project problems in real-life situations.
PO 2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO 2**	**Illustrate** how to behave professionally towards construction project management processing

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A7	PLO 7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO 1	**Present** the basics of Project team development, success factors, and how to deal with Project and construction management as an individual and as a member of multi-disciplinary teams.
A9	PLO 9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO 2	**Describe** the project participant's structure and its organizational forms
			CLO 3	**Explain** project construction methods and project delivery systems
B4	PLO 14	Deal with biddings, contracts and financial issues including project insurance and guarantees	CLO 4	**Apply** the Project management processes to enhance bidding decisions.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,3	CLO4	CLO1

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO 1	CLO 2	CLO 3	CLO 4
Intr. to Const. Manage., Project Lifecycle and Safety	1	√			
Project Def., Objectives, Project Success Factors	2, 3	√	√		
Project partners (Key Players)	4		√		
Types, Forms of Organization Structure	5, 6		√		
First Exam	**7**	√	√		
Project Team Charact., Building, and Development Stages	8, 9		√	√	

Project Manager	10	√	√	√	
Method Statement, Value Eng.	11			√	
Second Exam	12	√	√	√	
Bidding decision	13, 14			√	√
FINAL REVISION	15	√	√	√	√
Final Exam	16	√	√	√	√
Total		**8**	**9**	**5**	**3**

2.6. Lab Topics:

(Not applicable**)**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture	√			√
2. Tutorials	√			
3.Project-based Learning			√	
4. Computer-based Instruction				√
5. Hybrid Learning		√	√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	**First Exam**	√	√		
	Second Exam	√	√	√	
Assignments		√			√
Mini Projects				√	
Discussion			√	√	
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second)Exams	7,12	50
Assignments		3,10,13,14	6
Mini Projects		15	2
Discussion		4,6,9,13	2
Summative Assessment Method			
Final exam		16	40
Total			100

2.9. List of References:

Course Notes:	Project Management ppt. by Dr Ahmed Salman
Essential Books (Textbooks):	Successful Construction Project Management by Paul Netsh., CreateSpace Independent Publishing Platform, First Edition, 2014,
Recommended Books:	Stephens W. Nunnally, Construction Methods and Management, 8th Edition, Pearson (2011), ISBN 978-0132454360
Periodicals, Web Sites, … etc:	

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO 1	√	
PO 2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
CO 1	√	√		
CO 2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO 1	CLO 2	CLO 3	CLO 4
A7	PLO 7	√			
A9	PLO 9		√	√	
B4	PLO 14				√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A7	PLO 7	PO 2	CLO 1	Lecture	First, Second, and Final Exams
				Tutorial	Assignments
A9	PLO 9	PO 1	CLO 2	Hybrid Learning	First, Second, and Final Exams
					Discussion
			CLO 3	Hybrid Learning	Second and Final Exams
					Discussion
				Project-based Learning	Min-Project
B4	PLO14		CLO 4	Lecture	Final Exam
				Computer-based Instruction	Assignments

Course Coordinator: **Dr. Ahmed Fouad Salman** *Ahmed Salman*

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Environmental Engineering	**Code**	CMC 406	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Fourth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	0	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Environmental & Sanitary Engineering (CMC 403)

Introduction to environmental engineering, pollution problems, types of pollution, degrees of Pollution, sources of pollution, surface water pollution, groundwater Pollution, rain Water Pollution, sea & ocean water pollution, air pollution. Soil pollution, pollution control, pollution prevention. Samples conditions, chemical pollutions measuring in water, microbiological & biological pollution measuring in water, chemical pollutions measuring in air, chemical pollutions measuring in soil, microbiological & biological pollution measuring in soil, field pollution monitoring, environmental protection laboratory. Water supply, wastewater systems, solid waste management, air pollution. Solid waste management: collection, handling, separation and treatment, disposal, recycling and reuse. Monitoring and control, noise, air pollution, environmental laws and its applications

.2.2. Course Objectives (CO):

Program objective		Course objective	
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO1**	**Derive** the Philosophy of environmental engineering, pollution problems, types of pollution, degrees of Pollution, sources of pollution and sustainability principles.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	**Illustrate** different pollutants for environmental (Air Pollution, water pollution, noise pollution and solid waste management).

2.3. Course Learning Outcomes (CLOs):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning	CLO1	Modify the national and international regulatory related to environment and pollution
			CLO2	Discuss different Emissions which cause climate change and its Control - Environmental Impact Assessment - Ecological Sanitation.
B3	PLO13	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.	CLO3	Demonstrate nature and sources of air pollution and ways for control and reduction.
D2	PLO16	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	CLO4	Describe nature and sources of water pollution, Soil pollution, noise pollution, solid waste management and ways for control and reduction.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO3,4		CLO1,2

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
1.Introduction to Philosophy of environmental controls and introduction to national and international regulatory structures noise pollution	1	√	√		
2.Emissions control and environmental impact assessment	2,3	√	√		
3.Nature and sources of air pollution and air pollution control and reduction	4,5		√	√	
4.water pollution and ecological sanitation	6			√	
5.First Exam	7			√	
6.water pollution and ecological sanitation	8				√
7.noise pollution	9				√
8.Soil pollution	10,11				√
9.Second Exam	12			√	√
10. Solid wastes management	13,14				√
11. environmental laws and its applications	15	√			√
12. Final Exam	16			√	√
Total	**16**	**5**	**5**	**4**	**8**

2.6. Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture			√	√
2. Tutorials			√	√
3. Discussion			√	√
4. Presentation	√	√		
5. Report	√	√		
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**Quizzes**			√	√
	First Exam			√	
	Second Exam			√	√
Discussion		√	√		√
Assignments				√	√
Summative Assessment Method					
Final Exam				√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
	Quizzes	4,6,11,12	5 %
Discussion		3,5,8,10,13	2.5 %
Assignments		Every week	2.5 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	• Prof. M. Bassuieny, “Pollution and Environment “ (2019)
Essential Books (Textbooks):	• Peavy, Rowe and Tchobangolous " Environmental Engineering" McGraw Hill • Jeremy Colls, “Air Pollution”, second edition, by Spon Press 2002.

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives	
	CO1	CO2
PO2	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A5	PLO5	√	√		
B3	PLO13			√	
D2	PLO16				√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
A5	PLO5	PO2	CLO1	Presentation Report	Discussion
			CLO2	Presentation Report	Discussion
B3	PLO13	PO5	CLO3	Lecture	First, and Final Exams
				Tutorials	Assignments Quizzes
				Discussion	Discussion
D2	PLO16	PO5	CLO4	Lecture	First and Second Exams
				Tutorials	Quizzes Assignments
				Discussion	Discussion

Course Coordinator: **Dr. Osama Abdelaziz Abosiada**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the program	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Foundation Engineering		**Code**	CMC407
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Forth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**--**	**3**

2. Professional Information:

2.1. Course Description:

Pr.Req. : Soil Mechanics (CMC 305)

Slope stability analysis. Retaining structures. Walls for excavation. Slurry trenches and braced-cut systems. Types of foundation and design criteria. Design of shallow foundations and deep foundations, Construction methods. Pile load test. Dewatering and seepage control. Soil stabilization for foundation support.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO5	**Apply** analytical, experimental, design, construction engineering techniques, and project management skills with proficiency aided by modern tools.	**CO1**	**Apply** the construction and design considerations and modern engineering techniques to choose the appropriate type of shallow and deep foundations that meet safety standards and economic and societal factors.
		CO2	**Design** different types of shallow and deep foundations, considering the achievement of the optimal design, considering safety and economic factors.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A3	PLO3	**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.	CLO1	**Apply** the construction and design considerations for shallow foundations to select a suitable type to produce cost-effective solutions.
			CLO2	**Use** the appropriate deep foundation type and the applicable construction method for achieving the optimum design.
B2	PLO12	**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.	CLO3	**Design** the isolated footings and strip footings.
			CLO4	**Design** the combined footings and strap footings and rafts.
			CLO5	**Design** the pile foundations by evaluating the bearing capacity of piles then design pile caps.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4,5	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
1.Introduction, R.C. design criteria, and foundations types	**1**	√				
2.Shallow foundation (Construction & Design considerations)	**2**	√		√		
3.Design of isolated footings	**3**	√		√		

4.Design of isolated footings subjected to eccentric force	**4**	√		√		
5.Design of strip footings	**5**	√		√		
6.Design of combined footings	**6**	√			√	
7.First Exam	**7**			√	√	
8.Design of combined footings	**8**	√			√	
9.Design of strap foundations	**9**	√			√	
10. Design of raft foundations	**10**	√			√	
11. Deep foundations (Types - Construction & Design considerations)	**11**		√			
12. Second Exam	**12**				√	
13. Piles Foundations (Types - Tests)	**13**		√			√
14. Piles Foundations (bearing capacity – pile caps)	**14**		√			√
15. Piles Foundations (design of pile caps)	**15**		√			√
16. Final Exam	**16**			√	√	√
Total	**16**	**9**	**4**	**4**	**4**	**3**

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods:

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√	√	√	√	√
2. Tutorials			√	√	√
3. Discussion	√	√			
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods:

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	**First Exam**			√	√	
	Second Exam				√	
Discussion		√	√			
Assignments				√	√	√
Final Exam				√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First exam**	7	30 %
	Second exam	12	20 %
Discussions		10,14	4%
Assignments		2-5,8-10,13,14	6 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	• El-Kasaby, E. A., Engineering of Surface Foundations, Dar Al-Kutub Al-Almia, Cairo, 5th Ed., (19440/2015), ISBN 978 – 977 – 726 – 139 – 5, 2015. • El-Kasaby, E. A., Design and Construction of Deep and Special Foundations, Dar Al-Kutub Al-Almia, Cairo, 4th Ed., (10651/2016), ISBN 978 – 977 – 726 – 168 – 5, 2016.
Recommended Books:	• Das, B. M, Principles of Foundation Engineering, Brooks - Cole, 9th. Ed., ISBN 978 – 133 – 770 – 502 – 8, 2017. • Bowles, J., Foundation Analysis and Design, McGraw - Hill, 5th. Ed., ISBN 978 – 007 - 912 – 247 – 7, 2009.
Periodicals, Web Sites, … etc:	**https://www.geoengineer.org/education/karl-terzaghi/legacy-in-geotechnical-engineering**

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	**CO2**
PO5	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√	√			
CO2			√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A3	PLO3	√	√			
B2	PLO12			√	√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
A3	PLO3	PO5	CLO1	Lecture	Discussions
				Discussions	
			CLO2	Lecture	Discussions
				Discussions	
B2	PLO12		CLO3	Lecture	First, and Final Exams
				Tutorials	Assignments
			CLO4	Lecture	First, Second, and Final Exams
				Tutorials	Assignments
			CLO5	Lecture	Final Exams
				Tutorials	Assignments

Course Coordinator: **Dr. Mohab Roshdy Ahmed**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	**Construction Methods**		**Code**	**CMC408**
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**Fall Semester (**Fourth Level**)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	1	**2**	**0**	**2**

2. Professional Information:

2.1. Course description:

Design and construction of formwork systems; horizontal construction and formwork. And vertical construction and formwork. Concrete technology; mixing and batching concrete transporting concrete and placing and compacting concrete. Design and construction of dewatering systems; open sump system, well point system, and deep well system.; Design and construction of shoring systems; procedure to construct tunnels, roads, and dams. Evaluation and selection of appropriate construction technology, value engineering.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO1**	**Evaluate** the formwork types, Concrete testes, dewatering systems, and shoring systems.
		CO2	**Design** of the formwork types, dewatering systems, and shoring systems.
PO2	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO3**	**Manage** the site work crew and making the choices required to finish the tasks.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A4	PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO1	**Design** concrete formwork to ensure safety in the site.
			CLO2	**Determine** the concrete tests to find out the exact properties and strength of the concrete and to ensure that the mix is fit for purpose, whilst on site testing can also be carried out to ensure that the structural element strength.
D2	PLO16	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of structural design, construction, technology, and engineering problems.	CLO3	**Analysis** of structural system for dewatering and shoring systems.
			CLO4	**Design** of structural dewatering and shoring system according to Egyptian code.
A7	PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO5	**Apply** the basic principles for the review and approval of the structural items in the site efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams..
			CLO6	**Explain** important procedures to construct of structures with helping of multi-disciplinary and multi-cultural teams.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4	CLO5,6

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction of formwork systems	1	√					
Design and construction of formwork systems	2	√					
Introduction of Concrete technology	3		√				
Concrete properties, types and mixing procedure	4		√				
Durability of concrete	5		√				
Special concrete	6		√				
First Exam	7	√	√				
Introduction of dewatering systems	8			√			
Design of dewatering systems	9				√		
Introduction of shoring systems	10					√	
Procedure to construct tunnels, roads, and dams.	11					√	
Second Exam	12			√	√		
Appropriate construction technology of high-rise buildings	13					√	√
Value engineering "Lawrence D. Miles"	14,15					√	√
Final Exam		√	√	√	√		
Total	**12**	**2**	**4**	**1**	**1**	**4**	**2**

2.6 Lab Topics

NA

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lecture	√	√	√	√		
2. Tutorials	√	√	√	√		
3. Report					√	√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:			Course LOs Covered					
			CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
	Formative Assessment Method							
Tests		**First Exam**	√	√				
		Second Exam			√	√		
Report							√	√
Assignments			√	√	√	√		
Summative Assessment Method								
Final Exam			√	√	√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
Assignments		2-6,9-14	5%
Reports		13,14	5%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Recommended Books:	Fundamentals of Building Construction by Edward Allen, Joseph Iano, Wiley, Six Edition 2013.
Periodicals, Web Sites, … etc:	**https://www.cement.org/learn/concrete-technology**

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO5	√	√	
PO2			√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1			√		√	
CO2	√	√				
CO3				√		√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A4	PLO4	√	√				
D2	PLO16			√	√		
A7	PLO7					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO4	PO5	CLO1	Lecture.	First and Final Exams.
				Tutorials	Assignments.
			CLO2	Lecture.	First and Final Exams.
				Tutorials	Assignments.
D2	PLO16		CLO3	Lecture.	Second and Final Exams.
				Tutorials	Assignments.
		PO2	CLO4	Lecture.	Second and Final Exams.
				Tutorials	Assignments.
A7	PLO7	PO5	CLO5	Report	Report
		PO2	CLO6		

Course Coordinator: **Dr. Ibrahim Ali El-Azab**

Program Coordinator: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Design of R.C. Structures2	**Code**	CMC 409	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Fall Semester (Fourth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	0	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Design of R.C. structures-1 (CMC 304)

Paneled beams, Design of slender columns (braced and untraced), Design of simple reinforced concrete frames, Design of slab-type and cantilever-type stairs, Design of reinforced concrete beams subjected to combined shear and torsion. Design of frames, Brackets, Windbags. Structural Systems for tall buildings. Design of multistory frames. Design of concrete water tanks.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	**Apply** a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and **solve** engineering problems in real-life situations.	**CO1**	**Identify** the types of RC structure systems.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	**Design** the different Concrete elements geometrically & structure
PO5	Apply analytical, **experimental**, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO3**	**Analyze** the water RC structure elements and design waterside sections.

2.3. Course Learning Outcomes (CLOs):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A3	**PLO3**	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.	**CLO1**	**Apply** knowledge to choose the better type of structural system.
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO2**	**Use** different structural systems for planning the RC buildings.
B2	**PLO12**	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.	**CLO3**	**Analyze** the different RC structure elements.
			CLO4	**Design** the different reinforcement concrete structural elements according to ECP.
D2	**PLO16**	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	**CLO5**	**Apply** the Principals of designing to the water-structural elements**.**
			CLO6	**Make** the reinforcement details and draw the full structure details.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1.Paneled beams.	1	√	√	√	√		√
2.Design of slender columns (braced and untraced).	2,3	√	√	√	√		
3.Design of simple reinforced concrete frames	4			√	√		√
4.Design of slab-type and cantilever-type stairs.	5,6	√	√	√	√		
5.First Exam	7	√	√	√	√		√
6.Design of reinforced concrete beams subjected to combined shear and torsion	8			√	√		
7.Structural Systems for tall buildings	9	√	√	√			
8.Design of frames, Brackets, Windbags.	10,11			√	√		
9.Second Exam	12	√	√	√	√		√
10. Design of concrete water tanks	1314,15			√	√	√	√
11. Final Exam	16	√	√	√	√	√	√
Total	**16**	**4**	**4**	**8**	**7**	**1**	**3**

2.6. Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lecture	√	√	√	√	√	√
2. Tutorials		√	√	√	√	√
3. Discussion				√	√	√
4. Presentation		√		√	√	√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	**Quizzes**		√		√	√	√
	First Exam	√	√			√	√
	Second Exam	√	√	√		√	
Discussion			√		√	√	√
Assignments		√	√	√	√	√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
	Quizzes	4,6,11,12	5 %
Discussion		3,5,8,10,13	2.5 %
Assignments		Every week	2.5 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	• Shaker elbehary handbook. • ECP203-2020. • Design of RC Structure halls – DR.M. Hilal
Recommended Books:	• Design of RC Structure - V. 2 - DR. Mashhour A. Ghoneim.

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives		
	CO1	CO2	CO3
PO1	√		
PO2		√	
PO5			√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√				
CO2			√	√		
CO3					√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A3	PLO3	√					
A4	PLO4		√				
B2	PLO12			√	√		
D2	PLO16					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
A3	PLO3	PO1	CLO1	Lecture	First, Second, and Final Exams
A4	PLO4		CLO2	Lecture	First ,Second, and Final Exams
				Tutorials	Quizzes, and Assignments
				Presentation	Discussion
B2	PLO12	PO2	CLO3	Lecture	Second, and Final Exams
				Tutorials	Assignments
			CLO4	Lecture	Quizzes
				Tutorials	Assignments
				Presentation	Discussion
				Discussion	
D2	PLO16	PO5	CLO5	Lecture	First ,Second and Final Exams
				Tutorials	Quiz , and Assignments
				Presentation	Discussion
				Discussion	
			CLO6	Lecture	First and Final Exams
				Tutorials	Quizzes, and Assignments
				Presentation	Discussion
				Discussion	

Course Coordinator: **Ass. prof. Dr. Mohamad Makhlouf**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Slope Stability & Retaining Structure	**Code**	CMC410	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (Forth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	1	**2**	**--**	**2**

2. Professional Information:

2.1. Course Description:

Pr.Req. : Soil Mechanics (CMC 305)

Stability analysis of Slopes, Embankments, and Dams (Cr = 03) Landslide phenomenon: Types and causes of slope failures, Practical applications; Stability analysis of finite and Infinite slopes, Wedge methods, friction circle method; Method of slices, Bishop's method, Janbu's method; Effect of seepage, submerged and sudden draw down conditions; Design of slopes in cutting, Embankments, and Earth dams; Site Investigation: Reconnaissance, Preliminary and detailed investigation, Investigation for foundations; Advances in stability analysis of slopes. Earth pressure theories, conditions of applicability, arching effect; Retaining walls, Cantilever sheet pile wall; Anchored bulk head, Free and fixed earth support methods, Braced excavation, types, earth pressure, the effect of wall rigidity, and sequence of construction, Design of wall and wall supports; tunnels and shafts, pressure distribution, design of tunnel lining, methods of tunneling, and ground loss.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	**Apply** a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Develop** an understanding of the nature of the site and its problems for making suggestions and solutions, and analyzing slopes stability and the lateral earth pressure through the application of a wide spectrum of engineering knowledge, and science.
		CO2	**Derive** a range of engineering laws and sciences using analytical and systemic thinking to solve real-world engineering problems to achieve the optimal design of various earth-retaining structures.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
B1	PLO11	**Select** appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO1	**Analyze** the lateral earth pressure.
			CLO2	**Analyze** the slopes by checking their stability by different methods.
			CLO3	**Illustrate** all site problems, solutions, and suggestions for them by making site investigations.
B2	PLO12	**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.	CLO4	**Design** of walls and wall supports.
			CLO5	**Design** the sheet pile walls.
			CLO6	**Choose** the appropriate tunneling method for achieving the optimum design of tunnel lining.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO3	CLO1,2,4,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Introduction of Retaining Structures and Site investigations	1	√	√	√			
2. Lateral Earth Pressure theories	2	√					

3. Applications of Lateral Earth Pressure	3	√					
4. Stability of Retaining Walls	4	√	√		√		
5. Design of walls and wall supports	5				√		
6. Design of walls and wall supports	6				√		
7. First Exam	7	√	√		√		
8. Stability Analysis of Slopes	8		√				
9. Stability of Slopes Methods	9		√				
10. Cantilever Sheet Pile Wall	10	√				√	
11. Anchored Sheet Pile Wall	11	√				√	
12. Second Exam	12		√	√		√	
13. Site investigations	13			√			
14. Tunneling construction methods	14			√			√
15. Tunneling construction methods	15						√
16. Final Exam	16	√	√	√	√	√	√
Total	**16**	**6**	**4**	**3**	**3**	**2**	**2**

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1. Lecture	√	√	√	√	√	√
2. Tutorials	√	√			√	
3. Problem-based Learning			√			√
4. Discussion			√			√
5. Project-based Learning				√		
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	**First Exam**	√	√		√		
	Second Exam		√	√		√	
Discussion				√	√		√
Assignments		√	√			√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First exam**	7	30 %
	Second exam	12	20 %
Discussions		13,14	4%
Assignments		2-5,8-10,14	6 %
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	• El-Kasaby, E. A., Soil Mechanics, Dar Al-Kutub Al-Almia, Cairo, 5th Ed., (21371/2013), ISBN 978 – 977 – 726 – 041 – 1, 2014. • El-Kasaby, E. A., Design and Construction of Deep and Special Foundations, Dar Al-Kutub Al-Almia, Cairo, 4th Ed., (10651/2016), ISBN 978 – 977 – 726 – 168 – 5, 2016.
Recommended Books:	• Das, B. M, Principles of Foundation Engineering, Brooks - Cole, 9th. Ed., ISBN 978 – 133 – 770 – 502 – 8, 2017. • Bowles, J., Foundation Analysis and Design, McGraw - Hill, 5th. Ed., ISBN 978 – 007 - 912 – 247 – 7, 2009.
Periodicals, Web Sites, … etc:	**https://www.geoengineer.org/education/karl-terzaghi/legacy-in-geotechnical-engineering**

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	**CO2**
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√	√			
CO2				√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
B1	PLO11	√	√	√			
B2	PLO12				√	√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
B1	PLO11	PO1	CLO1	Lecture	First , and Final Exams
				Tutorials	Assignments
			CLO2	Lecture	First , Second and Final Exams
				Tutorials	Assignments
			CLO3	Lecture	Second and Final Exams
				Problem-based Learning	Discussions
				Discussions	
B2	PLO12		CLO4	Lecture	First , and Final Exams
				Project-based Learning	Discussions
			CLO5	Lecture	Second and Final Exams
				Tutorials	Assignments
			CLO6	Lecture	Final Exam
				Tutorials	Assignments
				Problem-based Learning	Discussions
				Discussions	

Course Coordinator: **Dr. Mohab Roshdy Ahmed**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Cost Engineering & Quantity Surveying	**Code**	**CMC 411**	
Type	**Compulsory ☒**	**Elective ☐**		
Semester	Fall Semester (Fourth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	1	**2**	**---**	**2**

2. Professional Information:

2.1. Course description:

This course examines the importance of cost engineering, cost estimating, project budget estimate, concept of cost monitoring and control, earned value concept, performance indices, cost prediction at completion. Bidding process and requirements, bid documents, construction quantities, pricing for resources, unit pricing, overheads, writing the bill, construction project exercises

2.2. Course Objectives (CO):

Program objective		Course objective	
PO 1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO 1**	Apply wide sets of cost estimate knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering management problems in real-life situations.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles	**CO2**	Perform professional behave, adhere to financial issues and project assurance engineering ethics and standards

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO 1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO 1	Identify the basics of Principle of cost estimate and indices
			CLO 2	Explain the basics of Quantity Take-off
A7	PLO 7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO 3	Illustrate efficiently how to deal with biddings, contracts, financial issues and project insurance as an individual and as a member of multi-disciplinary and multi-cultural teams
B4	PLO 14	Deal with biddings, contracts and financial issues including project insurance and guarantees	CLO 4	Calculate the p**roject's** direct cost and indirect cost
			CLO 5	Determine the balanced and unbalanced bid

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO4,5	CLO3

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction & Principals to Cost Estimate	1, 2	√		√		
Construction quantity take-off Methods	3, 4, 5	√	√			
Types of Cost Estimate Methods	6	√	√	√		
First Exam	**7**	√	√			
Types of Cost Estimate Methods	8	√	√	√		
Project Resources Cost	9, 10		√	√	√	
Direct &indirect costs	11		√		√	

Second Exam	12	√	√		√	
Balanced Bid	13		√		√	
Unbalanced Bid	14				√	√
Final Revision	15	√	√		√	√
Final Exam	16	√	√		√	√
Total		**8**	**10**	**4**	**6**	**2**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√	√		√	√
2. Tutorials		√			√
3. Problem-based Learning		√			√
4. Interactive learning			√		
5. Computer-based Instruction				√	
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	**First Exam**	√	√			
	Second Exam	√	√		√	
Observation				√		
Assignments			√		√	√
Summative Assessment Method						
Final Exam		√	√		√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First , Second Exams	7,12	50
Observation		2, 6, 8,10	2
Assignments		5,8,10,13	8
Summative Assessment Method			
Final exam		16	40
Total			100

2.9. List of References:

Course Notes:	Cost Estimate ppt by Dr Ahmed Salman
Essential Books (Textbooks):	David Bratt, Fundamentals of Construction Estimating, Cengage Learning; 4th edition (Jan., 2018): ISBN-13: 978-1337399395
Recommended Books:	Popescu C., Phaobunjong K. ,and Ovararin N., "Estimating Building Costs", Book of Marcel Dekker, 2003, Inc. ISBN: 0-8247-4086-6, http://www.dekker.com/
Periodicals, Web Sites, … etc:	**https://www.icoste.org/index.htm#icec**

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO 1	√	
PO 2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
CO 1	√	√			
CO 2			√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO 1	CLO 2	CLO 3	CLO 4	CLO5
A1	**PLO1**	√	√			
A7	**PLO7**			√		
B4	**PLO14**				√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	**PLO 1**	**PO1**	**CLO 1**	Lecture	First ,Second, and Final Exams
			CLO 2	Lecture	First ,Second, and Final Exams
				Tutorials Problem-based Learning	Assignments
A7	**PLO 7**	**PO2**	**CLO 3**	Interactive learning	Observation
B4	**PLO 14**	**PO1**	**CLO 4**	Lecture	Second, and Final Exams
				Computer-based Instruction	Assignments
			CLO5	Lecture	Final Exam
				Tutorials Problem-based Learning	Assignments

Course Coordinator: **Dr. Ahmed Fouad Salman** *Ahmed Salman*

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Highway Engineering	**Code**	CMC 412	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	2	0	3

2. Professional Information:

2.1. Course description:

Pr.Req. : Soil Mechanics (CMC 305)

Structural design: Soil classification for highways, Soil compaction, Drainage of highways and streets. Evaluation of soil strength for design of pavements, Methods of soil stabilization, Design of flexible and rigid pavements, Hot and cold asphaltic concrete, Asphaltic macadam, Maintenance of flexible and rigid pavements.
Geometric design: Highway classification, Traffic volume, Study and analysis of highways capacity, Design of cross section, sight distances, Vertical alignment of highway, Horizontal alignment of highway, Intersections (at grade and grade separation) Highways and environmental (noise – pollution).

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO1**	**Perform** the suitable methods of stabilization and compaction according to soil type.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	**Design** the main elements of highway.
		CO3	**Evaluate** the pavement distresses, & environmental impacts.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
B2	**PLO12**	Achieve an optimum design of Reinforced	**CLO1**	Evaluate soil characteristics
			CLO4	Design the pavements of

		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.		highway.
			CLO5	Design asphalt concrete mixtures .
			CLO6	Design the different elements of highway (cross section, vertical alignment, horizontal alignment, and intersections)
A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO2**	Apply practice research techniques to perform soil stabilization.
			CLO3	Apply practice research methods to perform soil compaction.
B3	**PLO13**	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.	**CLO7**	Evaluate the pavement distresses According to Egyptian code.
			CLO8	Assess environmental impacts of highway projects.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,3,4,5,6,7,8	**CLO2,3**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Soil classification for highways	1	√							
Soil strength for highways	2	√							
Soil compaction & stabilization for highways	3		√	√					
Pavement design	4				√				

	5				√				
Asphalt concrete mix	6					√			
First Exam	7	√			√				
Introduction to geometric design	8						√		
Sigh distance	9						√		
Vertical alignment design	10						√		
Horizontal alignment design	11						√		
Second Exam	12					√	√		
Intersection design	13						√		
Highway maintenance	14							√	
Environmental impacts of highway projects	15								√
Final Exam	16				√	√	√	√	√
Total	16	**2**	**1**	**1**	**2**	**1**	**5**	**1**	**1**

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**							
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Lectures	√			√	√	√	√	√
Tutorials	√			√	√	√	√	√
Reports		√	√					
Teaching and Learning Methods for Students with Special Needs:								
Methods								
1. Discussion Session								
2. Extra Lectures								
3. Provide different levels of books and materials								

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Formative Assessment Method									
Tests	First Exam	√			√				
	Second Exam					√	√		
Assignments		√			√	√	√	√	√
Reports			√	√					
Summative Assessment Method									
Final Exam					√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**(First, Second) Exams**	7,12	50 %
Assignments		2 - 6, 8 – 11, 14 - 15	5%
Reports		13	5%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	According to the lecturer
Essential Books (Textbooks):	Traffic and Highway Engineering, Nicholas Garber and Lester Hoel, Fifth Enhanced SI Edition, CENGAG Learning, 2020, ISBN-13: 978-1-337-63104-4.
Periodicals, Web Sites, … etc:	The students themselves can search the internet network for pages which help themselves in preparing reports. **As: https://www.intechopen.com/books/6103**

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO4	√		
PO5		√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
CO1		√	√					
CO2	√			√	√	√		
CO3							√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
A5	PLO5		√	√					
B2	PLO12	√			√	√	√		
B3	PLO13							√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO4	CLO2	• Reports	• Reports
			CLO3	• Reports	• Reports
B2	PLO12	PO5	CLO1	• Lecture • Tutorials	• First Exam • Assignments
			CLO4	• Lecture • Tutorials	• First and Final Exams • Assignments
			CLO5	• Lecture • Tutorials	• Second and Final Exams • Assignments
			CLO6	• Lecture • Tutorials	• Second and Final Exams • Assignments
B3	PLO13	PO5	CLO7	• Lecture • Tutorials	• Final exam • Assignments
			CLO8	• Lecture • Tutorials	• Final exam • Assignments

Course Coordinator: **Dr Ahmed Gamal** 

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen** 

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management				
Department Offering the course	Construction Engineering and Management				
Date of Specification Approval	**5/9/2023**				
Course Title	Foundations of marketing			**Code**	**HS402**
Type	**Compulsory** ☐		**Elective** ☒		
Semester	Spring Semester (Fourth Level)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**	
	2	**0**	**0**	**2**	

2. Professional Information:

2.1. Course description:

Definition of marketing, Objective of marketing systems, Hierarchy of marketing systems, Role of marketing for the economic unit with planning strategy, Concepts and practices in strategic marketing, Process of marketing, Marketing information system, 4 ”P´s” of marketing(product, price, place, promotion), Consumer markets and purchasing behavior, Pricing strategy, Marketing channels, Communication marketing means: advertising and promotion.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills	**CO 1**	Mange the practices of 4 P‘S and display leadership qualities to achieve consumer satisfaction and organization objective.
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields.	**CO 2**	Illustrate the tasks and practices of marketing management, whether on a strategic, tactical, or operational level.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning	CLO 1	Use research techniques about consumer protection organizations in Egypt
A6	PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO 2	Discuss the marketing concept, as a first step to achieve planning strategic marketing
			CLO 3	Explain the basics of marketing strategies (4 P 'S)
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO 4	Solve some issues and propose solutions to marketing issues through case studies and brainstorming

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,3	CLO4	CLO1

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Marketing concept and the marketing process	1		√		√
Strategic Planning of Marketing	2,3		√		√
The Marketing Environment	4		√		√
Segmentation and Targeting	5,6		√		√
First Exam	7		√		√
Product Pricing and Distribution Strategies	8,9			√	

New product development and product life cycle strategies	10,11			√	
Second Exam	12			√	
Integrated Marketing Communication	13			√	
Consumer Protection	14,15	√			
Final Exam	16		√	√	√
Total	**16**	**2**	**6**	**5**	

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture		√	√	
2.Discussion		√		
3.Report	√			
4. Brain Storming				√
5. Problem-based Learning				√
6. Hybrid Learning				√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	**First Exam**		√		√
	Second Exam			√	
Report		√			
Observation					√
Discussion			√		√
Summative Assessment Method					
Final Exam			√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Report		15	6%
Observation		2-5	2%
Discussion		2-5	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	د. نريمان عمار د. حيان ديب ، مدخل الى التسويق ، الجامعة الافتراضية السورية ، الجمهورية العربية السورية ، 2020 م . Kotler, P & Armstrong, G. (2016). Marketing: An Introduction (16th ed.). Upper Saddle River, NJ: Prentice-Hall. ISBN: 978-0-13-379502-8
Recommended Books:	د. محمد عبد الله عبد الرحيم ، التسويق المعاصر ، المؤلف ، القاهرة ، 2007 م
Periodicals, Web Sites, … etc:	Marketing Magazine

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1			√	√
CO2	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A5	PLO 5	√			
A6	PLO 6		√	√	
A9	PLO 9				√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	**PLO 5**	**PO4**	**CLO1**	Report	Report
A6	**PLO 6**	**PO4**	**CLO2**	Lecture	First and Final Exam
				Discussion	Discussion
		PO3	**CLO3**	Lecture	Second and Final Exam
A9	**PLO 9**		**CLO4**	Hybrid Learning	First and Final Exam
				Brain Storming	Observation
				Problem-based Learning	Discussion

Course Coordinator: **Dr. Marwa Abd-El Hameid** د.مروة عبدالحميد

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Introduction to Finance		**Code**	**HS404**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Fourth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**0**	**0**	**2**

2. Professional Information:

2.1. Course description:

Principles of investments, Financial analysis of corporate projects, Cost of capital, and Capital structure and financing policies. Fixed and running costs, Cost analysis, Feasibility studies and economic analysis and alternatives decisions.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills	**CO 1**	Illustrate the role of financial management in industry and display entrepreneurial skills.
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields.	**CO 2**	Evaluate the impact of finance on business decisions and develop techniques and skills related to finance

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning	CLO 1	Use research techniques about the alternative decisions on investments in Egypt.
A6	PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO2	Explain the goal of financial management and monitor implementation of engineering projects
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO 3	Calculate the future/ present value and rate of return on investment that involve single/ multiple cash flows.
			CLO 4	Solve some problems about computing stock prices through brainstorming.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2	CLO3,4	CLO1

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Principles of investments	1		√		
Financial analysis of corporate projects	2,3		√		
Cost of capital	4		√		
Capital structure and financing policies	5,6		√		
First Exam	7		√		
Fixed and running costs	8,9			√	√
Cost analysis	10,11			√	√
Second Exam	12			√	√
Feasibility studies	13		√		
Economic analysis alternatives decisions	14,15	√			
Final Exam	16		√	√	√
Total	**16**	**2**	**7**	**4**	**4**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture		√		
2.Discussion		√		
3.Report	√			
4. Brain Storming			√	√
5. Problem-based Learning			√	√
6. Hybrid Learning			√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**		√		
	Second Exam			√	√
Report		√			
Observation				√	√
Discussion			√	√	√
Summative Assessment Method					
Final Exam			√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Report		15	6%
Observation		8-11	2%
Discussion		4,5,9,10	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes	Lecture Notes
Essential Books (Textbooks):	Introduction to Finance: Markets, Investments, and Financial Management, Ronald W. Melicher, Edgar A. Norton, 2019,ISBN 1119561175

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A5	PLO 5	√			
A6	PLO 6		√		
A9	PLO 9			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO 5	PO3	CLO1	Report	Report
A6	PLO 6		CLO2	Lecture	First and Final Exam
				Discussion	Discussion
A9	PLO 9	PO4	CLO3	Hybrid Learning	Second and Final Exam
				Brain Storming	Observation
				Problem-based Learning	Discussion
			CLO4	Hybrid Learning	Second and Final Exam
				Brain Storming	Observation
				Problem-based Learning	Discussion

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Human Computer Interaction		**Code**	**HS406**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Fourth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**0**	**0**	**2**

2. Professional Information:

2.1. Course description:

History and overview, Foundations of human-computer interaction, Graphical user interface, I/O technologies, Human-centered software evaluation, Human-centered software development, Interactive graphical user-interface design, Graphical user-interface programming.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO 1**	Analyze interaction problems from a technical, cognitive, and functional perspective with a heterogeneous team
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields.	**CO 2**	Design different graphical user interfaces using different strategies to communicate effectively in academic / professional fields.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning	**CLO 1**	Use research techniques about history of foundations of human-computer interaction
A8	**PLO8**	Communicate effectively – graphically, verbally and in writing – with a	**CLO2**	Identify the various tools and techniques for interface analysis, design, and evaluation.

		range of audiences using contemporary tools	**CLO 3**	Illustrate the importance of working in teams and the role of each member within an interface development phase.
A9	**PLO9**	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO 4**	Design effective and usable graphical computer interfaces.
			CLO5	Create an awareness of the range of general human-computer interaction issues that must be considered when designing information systems.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,3	**CLO4,5**	**CLO1**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction to foundations of human-computer interaction	1	√				
Graphical user interface	2,3	√	√			
I/O technologies	4		√	√		
Human-centered software evaluation	5,6		√	√		
First Exam	7		√	√		
Human-centered software development	8		√	√	√	√
Interactive graphical user-interface design	9-11				√	√
Second Exam	12		√	√		
Graphical user-interface programming	13-15				√	√
Final Exam	16		√	√		
Total	**16**					

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
1. Lecture		√	√		
2. Presentations				√	√
3.Report	√				
4. Project-based Learning				√	√
5. Brain Storming		√	√		
6. Hybrid Learning				√	√
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method						
Tests	**First Exam**		√	√		
	Second Exam		√	√		
Report		√				
Presentations					√	√
Mini-Project					√	√
Observation			√	√		
Discussion					√	√
Summative Assessment Method						
Final Exam			√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Report		4	2%
Presentations		8-11,13,14	2%
Mini-Project		15	2%
Observation		4-6,8	2%
Discussion		8-11,13,14	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes	Lecture Notes
Recommended Books	Human-Computer Interaction 3rd Edition, Alan Dix , 2004,ISBN 9780130461094
Periodicals, Web Sites, … etc:	https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-hci/

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√	√	√		
CO2				√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A5	PLO 5	√				
A8	PLO 8		√	√		
A9	PLO 9				√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO 5	PO3	CLO1	Report	Report
A6	PLO 8		CLO2	Lecture	First, Second and Final Exam
				Brain Storming	Observation
			CLO3	Lecture	First, Second and Final Exam
				Brain Storming	Observation
A9	PLO 9	PO4	CLO4	Hybrid Learning	Discussion
				Presentations	Presentations
				Project-based Learning	Mini-Project
			CLO5	Hybrid Learning	Discussion
				Presentations	Presentations
				Project-based Learning	Mini-Project

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Sustainable Development		**Code**	**HS408**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Fourth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**0**	**0**	**2**

2. Professional Information:

2.1. Course description:

Different definition for development, development in developing countries, concept and fundamental of sustainable development, goals and importance of sustainable development, obstacles of sustainable development, environment and sustainable development, ecosystems and the effect of economic activities, population growth and natural resources, priorities of international society for achieving sustainable development.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO 1**	Use entrepreneurial skills and leadership qualities to apply the concept and fundamental of sustainable development in Egypt
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields.	**CO 2**	Design sustainability performance metric to assess the impact on community's sustainable development using self-learning and life-long learning strategies.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning	CLO 1	Use research techniques about sustainable development in Egypt.
A8	PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	CLO2	Identify the historical evolution, key theories, and concepts of sustainable development
			CLO 3	Discuss the major issues affecting sustainable development and how sustainable development can be achieved in practice.
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO 4	Analyze arguments, similarities, and disagreements in the sustainability debate.
			CLO5	Create skills that will enable students to understand attitudes on individuals, society and their role regarding causes and solutions in the field of sustainable development.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO3,4		CLO1,2

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Different definition for development	1		√			
Development in developing countries	2,3	√	√			
Concept and fundamental of sustainable development	4		√	√		
Goals and importance of sustainable development	5		√	√		
Obstacles of sustainable development	6		√	√		
First Exam	7		√	√		
Environment and sustainable development	8-9				√	√
Ecosystems and the effect of economic	10-11				√	√

activities						
Second exam	12		√	√	√	√
Population growth and natural resources	13				√	√
Priorities of international society for achieving sustainable development.	14-15				√	√
Final Exam	16		√	√	√	√
Total	**16**	**2**	**6**	**6**	**7**	**7**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture		√	√		
2. Presentations				√	√
3.Report	√			√	√
4. Hybrid Learning				√	√
5.Discussion		√	√		
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	**First Exam**		√	√		
	Second Exam		√	√	√	√
Report		√			√	√
Presentations		√			√	√
Discussion			√	√		
Summative Assessment Method						
Final Exam			√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Report		4,15	4%
Presentations		15	4%
Discussion		3-6	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes	Lecture Notes
Essential Book	Buheji, M (2020) 'Visualising Resilient Communities', Authorhouse Publishing, UK.ISBN 978-1-7283-9928-7.
Recommended Book	Blewitt, John. 2009.Understanding Sustainable Development . Sterling, VA:Earthscan
Periodicals, Web Sites, … etc:	https://sdgs.un.org/goals

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√	√	√		
CO2				√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
PLO 5	√				
PLO 8		√	√		
PLO 9				√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO 5	PO3	CLO1	Report	Report Presentations
A6	PLO 8		CLO2	Lecture	First, Second and Final Exam
				Discussion	Discussion
			CLO3	Lecture	First, Second and Final Exam
				Discussion	Discussion
A9	PLO 9	PO4	CLO4	Hybrid Learning	Second and Final Exam
				Presentations	Report Presentations
				Report	
			CLO5	Hybrid Learning	Second and Final Exam
				Presentations	Report Presentations
				Report	

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Legislation & Engineering Ethics	**Code**	UHS401	
Type	**Compulsory ☒**	**Elective ☐**		
Semester	**Fall Semester (Fourth Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	0	0	**2**

2. Professional Information:

2.1. Course description:

Definition of law and its duties. Highlights on the civil and criminal laws on the engineer, Highlights on the laws of syndicates and enterprises. Highlight on the laws of taxes and environment protection. Scope and objectives of the ethics of the engineering profession. Nature of the engineering professions (experimentation, safety, risk and carelessness), Professional behavior, Responsibilities towards customers and supervisors, Rules, Rights of Engineers, Codes of Ethics, Engineers as Managers, Consultants and Leaders.

2.2. Course **Objectives (CO):**

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Create mindfulness on engineering ethics to instill moral and social values and faithfulness faithfulness in real-life situations.
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO2**	Explain knowledge on intellectual property rights and design practices for providing safety in all professional fields

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO1**	Demonstrate an ethical issues in the subject matter under investigation or in a relevant field
		CLO2	Identify the multiple ethical interests at stake in a real-world situation or practice
PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**CLO3**	Create awareness to provide safety, risk reduction and risk benefit analysis
		CLO4	Demonstrate knowledge of ethical values and codes to integrate, synthesize, and apply knowledge of ethical dilemmas and solutions

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2,4	**CLO3**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to Engineering Ethics	1	√			
Ethical Issues Faced by Engineers	2	√			
Engineering Codes of Ethics	3	√			
Professionalism and Codes of Ethics	3	√			
Ethical Theories	4		√		
Plagiarism & Cheating	4		√		
Risk, Safety, and Accidents	5		√	√	
Designing for Safety	5			√	
Professional Rights	6			√	
Ethics in Research and Experimentation	6			√	
First Exam	7	√	√	√	
Egyptian code, The ethics of practicing the engineering profession	8				√
The first: General responsibilities of the engineer towards the community	9				√
The second: The engineer's relationship with the engineering community towards fellow engineers	10				√
Third: Intellectual property	11				√
Second Exam	12			√	√

Fourth : Responsibility of the engineer towards customers	**13**				√
Fifth : Professional Practice: Business Preparation	**14**				√
Sixth: Continuing education and training	**15**				√
Final Exam	**16**	√	√	√	√
Total	**16**	**3**	**5**	**2**	**7**

2.6. Lab Topics:

NA

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture				√
2. Hybrid Learning	√	√		
3. Interactive learning			√	√
4-Self-Learning			√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	**First Exam**	√	√		
	Second Exam			√	√
Observation				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		**Week**	**The weighting of Assessment %**
Formative Assessment Method			
Tests	**First exam**	7	30
	Second exam	12	20
Observation			10
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Egyptian code, The ethics of practicing the engineering profession
Essential Books (Textbooks):	Engineering ethics: Concepts and cases, 6th ed. by Charles E. Harris; Michael S. Pritchard; Michael J. Rabins; Ray James; Elaine Englehardt, 2019
Recommended Books:	Engineering ethics: Real world case studies by Steve Starrett; Amy L. Lara; Carlos, 2017
Periodicals, Web Sites, … etc:	

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Library Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A9	PLO9	√	√		
A10	PLO10			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A9	PLO9	PO1	CLO1	• Hybrid Learning	• First and Final Exams
			CLO2		
A10	PLO10	PO4	CLO3	• Self-Learning • Interactive learning	• Second and Final Exams • Observation
			CLO4	• Lecture • Interactive learning	• Second and Final Exams • Observation

Course Coordinator: **Prof. Elsayed Fouad**

Program Coordinator: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management				
Department Offering the course	Construction Engineering and Management				
Date of Specification Approval	**5/9/2023**				
Course Title	Concrete and Steel Bridges			**Code**	**CMC501**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	Fall Semester (Fifth Level)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**	
	2	**3**	**-**	**3**	

2. Professional Information:

2.1. Course description:

Pr.Req. : Design of R.C. Structures2 (CMC 409)

Types of bridges, Loads: dead, live, impact, wind and other loadings. Basic design and construction of various types of bridges: truss, beam and plate girder, slab, box girder. Bearing and expansion details.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO1**	Design of the elements of the bridges.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	Design of plate girders as a built-up section.
		CO3	Design of pre-stressed concrete beam.

2.3. Course Learning Outcomes (CLO's):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A3	**PLO3**	Apply engineering design processes to produce cost-effective solutions that meet specified needs with	**CLO1**	Apply specified consideration to planning the bridges.
			CLO2	Apply of different loads,

		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.		structural analysis of bridges.
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO5**	Utilize codes of practice and standards of steel structures to check the allowable stresses.
			CLO6	Utilize codes of practice and standards of steel structural to check safety requirements (serviceability &deflection)
B2	**PLO12**	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.	**CLO3**	Calculate the critical straining actions for bridge elements.
			CLO4	Design of bridge elements.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Classical bridge types - Different bridge systems.	1	√					
Layout of roadway bridges.	2	√					
Design of floor beams systems (Stringer)	3		√	√			

Design of floor beams systems (Cross girder)	4			√			
Design of floor beams systems (Main girder)	5			√	√		
Design of plate girder bridges (built-up section).	6				√		
First Exam	7	√	√	√	√		
Design of stiffeners	8				√	√	
Design of Splices.	9				√	√	
Design of pre-stressed concrete beam	10,11				√	√	√
Second Exam	12			√	√	√	√
Design of wind bracing	13		√		√	√	√
Design of bridge bearings.	14			√	√	√	√
Final Exam	**16**	√			√	√	√
Total	**16**	**2**	**2**	**4**	**8**	**6**	**4**

2.6 Lab Topics

N.A.

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1. Lecture	√	√	√	√		
2. Tutorials				√	√	√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	Quiz	√			√	√	√
	First Exam	√	√	√	√		
	Second Exam			√	√	√	√
Assignments		√	√	√	√	√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
	Quizzes	5,9,11	5%
Assignments		4,6,10,11,13	5%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	- Staff lectures notes
Essential Books (Textbooks):	1- Egyptian code for design of steel structure (ASD). 2- "Design of bridge structures" by T. R. Jagadeesh and M. A. Jayaram, ISBN-13: 978-9389347609, ISBN-10: 9389347602 (2020).
Recommended Books:	"Bridge Design-Concepts and Analysis" by Antonio J. Reis and Jose J. Oliveira Pedro, ISBN: 978-0-470-84363-5, (2019).
Periodicals, Web Sites, … etc:	**http://hti.edu.eg/en/academic-file.aspx?id=1672&departmentid=1028&academicid=239**

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO2	√		
PO5		√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√					
CO2		√	√			
CO3				√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A3	PLO3	√	√				
A4	PLO4					√	√
B2	PLO12			√	√		

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A3	PLO3	PO2	CLO1	• Lecture.	• First, and Final Exams. • Assignments, Quiz.
			CLO2	• Lecture.	• First, and Final Exams • Assignments.
A4	PLO4	PO5	CLO5	• Tutorials.	• Second , and Final Exams. • Assignments, Quiz.
			CLO6	• Tutorials.	• Second , and Final Exams. • Assignments, Quiz.
B2	PLO12		CLO3	• Lecture..	• First, and second exam • Assignments
			CLO4	• Lecture. • Tutorials.	• First, second , and Final Exams. • Assignments, Quiz.

Course Coordinator: **Assoc. Prof. Nader Nabih Khalil**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Computer Applications in Civil Engineering	**Code**	CMC 502	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	Spring Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	0	3	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Computer Programming (FRE 110)

Principle of FORTRAN programming. New computer systems (computer network, internet, and operating systems). Computer applications in civil engineering (numerical applications, and engineering applications).

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	**Apply** a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and **solve** engineering problems in real-life situations.	**CO1**	Apply fundamental Modeling skills and general Modeling concepts.
PO2	**Behave** professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	Generate computer programming systems to use in civil applications with behaving engineering ethics and standards.

2.3. Course Learning Outcomes (CLOs):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A3	PLO3	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.	CLO1	**Identify** the programming language (MS EXCEL), the Screen Elements, and Navigating in the Excel Environment.
B2	PLO12	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.	CLO2	**Choose** a suitable function of the excel program for civil applications.
			CLO3	**Use** Conditional Formatting, Create a Function, Drop-Down List, and Sheet protection.
			CLO4	**Describe** New computer systems
B3	PLO13	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.	CLO5	**Apply** solver (manage construction processes, solve equations), applications.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,4	CLO2,3,5	

2.5. Course (Lab) Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
1. Introduction to Microsoft Excel., navigating in the Excel Environment and New computer systems	1,2	√			√	
2. Count, Summations, If, Functions	3		√			
3. Date Time, Average, Minimum, and Maximum Functions.	4		√			

4. Lookup, Triangular Functions.	5		√			
5. Conditional Formatting	6			√		
6. First Exam	7		√	√		
7. How to Create a Drop-Down List in Excel	8			√		
8. How to. Create a Function and protections	9			√		
9. Solver	10,11					√
10. Second Exam	12		√	√		√
11. Applications	12-15					√
12. Final Exam	16		√	√		√
Total	**16**	**2**	**3**	**3**	**2**	**6**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√				
2. Computer-based Learning		√	√		√
3. Report				√	
4. Hybrid Learning		√	√		√
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.7 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	First Experimental Test		√	√		
	Second Experimental Test		√	√		√
	Quiz	√				
Report					√	
Summative Assessment Method						
Practical			√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Experimental Test	7	30%
	Second Experimental Test	12	20%
	Quiz	2	5%
Report		8	5%
Summative Assessment Method			
Practical		16	40 %
Total			100 %

2.8. List of References:

• Course Notes:	• Dr. Ahmed Youssef Notes
• Essential Books (Textbooks):	CSI SAP2000 Analysis Reference Manual Joan Lambert and Curtis Frye, Microsoft Excel Step by Step (Office 2021 and Microsoft 365), Published with the authorization of Microsoft Corporation by: Pearson Education, Inc., 2022. William Fischer, Excel: QuickStart Guide from Beginner to Expert, CreateSpace Independent Publishing Platform, 2016
Recommended Books:	Steven C. Chapra, Raymond Canale , Numerical Methods for Engineers: With Software and Programming Applications, McGraw-Hill Science/ Engineering/ Math; 4 edition, 2001
Periodicals, Web Sites, … etc:	• https://www.csiamerica.com/products/sap2000 • https://www.guru99.com/introduction-to-microsoft-excel.html

2.9. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Laboratory Usage	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives	
	CO1	CO2
PO1	√	
PO2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√		√		
CO2		√		√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes		Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A3	PLO3	√				
B2	PLO12		√	√	√	
B3	PLO13					√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A3	PLO.3	PO1	CLO.1	• Lecture	• Quizzes
B2	PLO.12	PO2	CLO.2	• Computer-based Learning • Hybrid Learning	• First and Second Experimental Test, Practical Exam
		PO1	CLO.3	• Computer-based Learning • Hybrid Learning	• First and Second Experimental Test, Practical Exam
		PO2	CLO.4	• Report	• Report
B3	PLO.13		CLO5	• Computer-based Learning • Hybrid Learning	• Second Experimental Test, Practical Exam

Course Coordinator: Dr. Ahmed Youssef Kamal El-Deen

Head of Department Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Dynamics of Structures		**Code**	CMC 503
Type	**Compulsory ☒**		**Elective ☐**	
Semester	**Spring Semester (Fifth Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**0**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Structural Analysis-2 (CMC 202)

Introduction to structural dynamic: Types of dynamic loads and the formulation of the equation of motion. Single degree of freedom systems, undamped and damped free and forced vibrations. Two degrees of freedom and multi degree of freedom systems. Mode shapes - Seismological background and Lateral load resisting systems - Code applications. Response of structures to earthquakes.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Formulate the Equation of motion for single-degree and multi degrees systems under different vibration systems.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	Analyze spectrum and different mode shapes for single and multi-degree of freedom systems

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	**PLO1**	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**CLO1**	Form the Equation of motion for single and multi-degree of freedom systems
A3	**PLO3**	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.	**CLO2**	Investigate free and forced vibration
			CLO3	Study undamped and damped vibration
			CLO4	Examine single and multi-degree of freedom systems
B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO5**	Discuss the dynamic analysis and environmental loads
			CLO6	Present an overview of Seismological background, Lateral load resisting systems and an introduction to earthquake analysis methods.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO4,5,6	**CLO1,2,3**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to dynamic analysis	1	√				√	
Types of environmental loads	2					√	
Formulation of the Equation of motion	3	√	√				
Single degree of freedom systems (Free vibration)	4		√	√			
Single degree of freedom systems (Damping vibration)	5		√	√	√		
Single degree of freedom systems (Forced vibration)	6		√	√	√		
First Exam	7	√	√	√	√		
Two degree of freedom systems	8,9	√	√		√		
Multi degree of freedom systems	10		√		√	√	
Model analysis (Eigen value problem)	11	√	√		√		
Second Exam	12	√	√		√	√	
Mode shapes (Eigen vector)	13	√	√		√	√	
Seismological background and Lateral load resisting systems	14					√	√
Introduction to Earthquake analysis using equivalent static method and response spectrum method	15					√	√
Final Exam	16	√	√	√	√	√	√
Total	**16**	**9**	**9**	**3**	**7**	**6**	**2**

2.6. Lab Topics:

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lectures	√	√	√	√	√	√
2. Tutorials	√	√	√	√		
3. Presentations						√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	**First Exam**	√	√	√	√		
	Second Exam	√	√		√	√	
	Quiz	√	√	√	√		
Assignments		√	√	√	√		
Report							√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses %
Formative Assessment Method			
Tests	First exam	7	30
	Second exam	12	20
	Quiz	3,5,10,13	4
Assignments		3,4,6,7,13	4
Report		15	2
Summative Assessment Method			
Final Exam		**16**	40
Total			**100**

2.9. List of Reference:

Essential Books (Textbooks):	William T. Thomson (auth.)-Theory of Vibration with Applications-Springer US (1st edition 1993)
Recommended Books:	Dynamics of Structures: Theory and Applications to Earthquake Engineering by Anil K. Chopra (1st edition 1995)
Web Sites, … etc:	https://engineering.purdue.edu/UCIST/TeachingModules/UG%20Exercises/Introduction%20to%20Dynamics%20of%20Structures/student.pdf

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√				√
CO2			√	√	√	

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A1	**PLO1**	√					
A3	**PLO3**		√	√	√		
B1	**PLO11**					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	**PLO1**	**PO1**	**CLO1**	• Lectures	• First, Second and Final Exam
				• Tutorials	• Assignment, Quiz
A3	**PLO3**		**CLO2**	• Lectures	• First, Second and Final Exam
				• Tutorials	• Assignment, Quiz
		PO2	**CLO3**	• Lectures	• First, Second and Final Exam
				• Tutorials	• Assignment, Quiz
			CLO4	• Lectures	• First, Second and Final Exam
				• Tutorials	• Assignment, Quiz
B1	**PLO11**		**CLO5**	• Lectures	• Second and Final Exam
		PO1	**CLO6**	• Lectures	• Final Exam
				• Presentations	• Report

Course Coordinator: **Prof. Ashraf Mohamed Abu-Rayan**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Quality Control, Inspection and Repair of Structures		**Code**	**CMC504**
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**Spring Semester (Fifth Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Structural Analysis-2 (CMC 202)

Introduction to quality improvement techniques. Control charts for variables and attributes. Quality systems; 1SO 9000, 1SO 14000. Total quality management. Maintenance of structures. Inspection and its related subjects. Deterioration of structures, causes and investigation. Structural behavior and different repair techniques for different structural materials.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO1**	Apply wide sets of civil engineering knowledge to identify and solve different problems related to maintenance and inspection of structures
		CO2	Improve quality techniques , different repair techniques and estimate their quantities

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health	**CLO1**	Illustrate the quality improvement techniques, control charts for variables and quality system

		and safety requirements, environmental issues and risk management principles	**CLO2**	Explain ISO guidelines
B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	Evaluate different quality improvement techniques
			CLO4	Modify the different repair techniques for different structural materials

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	**CLO3,4**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to quality improvement techniques	**1,2**	√			
Control charts for variables and attributes. Quality systems; 1SO 9000, 1SO 14000.	**3,4,5**	√	√		
Total quality management	**6**	√			
First Exam	**7**	√	√		
Total quality management	**8**	√		√	
Deterioration of structures, causes and investigation	**9,10,11**			√	
Second Exam	**12**	√		√	
Structural behavior and different repair techniques for different structural materials	**13,14,15**			√	√
Final exam	**16**	√	√	√	√
Total	**16**	**7**	**3**	**7**	**3**

2.6. Lab Topics:

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√	√	√
2. Tutorials			√	√
3.Reports		√		
4.Project-based Learning				√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	First Exam	√	√		
	Second Exam	√		√	
Reports			√		
Assignments				√	√
Presentations					√
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second) Exams	7,12	50
Report		14	3
Assignments		9,11 , 13,14	2
Presentation		15	5
Summative Assessment Method			
Final exam		16	40
Total		16	100

2.9. List of References:

Course Notes:	Lecture Notes
Essential Books (Textbooks):	Repair of building (2016) By Prof Elsayed Elkasby ISBN: 9789777261401

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO5	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A4	PLO4	√	√		
B1	PLO11			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO4	PO5	CLO1	• Lecture	• First , Second and Final Exams
			CLO2	• Lecture • Report	• First and Final Exams • Report
B1	PLO11		CLO3	• Lecture • Tutorials	• Second and Final Exams • Assignments
			CLO4	• Lecture • Tutorials • .Project-based Learning	• Final Exam • Assignments • Presentation

Course Coordinator: Dr Ahmed Abouelfetouh Abdelaziz 

Head of Department: Dr. Ahmad Youssef Kamal El Din Mohamed 

Date: 5/9/2023

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Building Construction		**Code**	**CMC505**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Fall Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	**3**

2. Professional Information:

2.1. Course description:

The course introduces basic information about: building systems, wall bearing and skeleton systems, foundations concept, wall and partitions types, ceiling and roofs, damp proofing materials and details, stairs, building opening, services, and finishing materials.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO1**	Apply wide sets of civil engineering knowledge to identify and solve different problems related to building components
		CO2	Estimate and identify different building components

2.3. Course Learning Outcomes (CLO's):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning	**CLO1**	Identify different components of building such as building systems, wall bearing and skeleton systems, foundations concept
A10	**PLO10**	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**CLO2**	Calculate amount of formwork for foundation, column and ceiling

D1	**PLO15**	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies and human sciences	**CLO3**	Calculate different types of building materials such as brick, ceiling, roofs, damp proofing materials
D2	**PLO16**	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	**CLO4**	Calculate water, thermal and sound insulation system for building

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1	**CLO2,3,4**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Building systems, wall bearing	1,2	√			
Skeleton systems, foundations concept	3,4	√	√		
Wall and partitions types,	5,6	√		√	
First exam	7			√	
Ceiling and roofs, damp proofing materials	8,9			√	
Stairs, building opening	10,11	√	√		
Second exam	12			√	√
Finishing materials	13,14,15	√		√	√
Final exam	16			√	√
Total	**16**	**11**	**4**	**7**	**3**

2.6. Lab Topics:

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture			√	√
2. Tutorials			√	√
3. Reports		√		
4.Presentaion	√		√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	First Exam			√	
	Second Exam			√	√
Reports		√	√		
Assignments				√	√
Quizzes				√	√
Summative Assessment Method					
Final Exam				√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
Report		14	5%
Quizzes		13,14	2%
Assignments		2-6,9-13	3%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Essential Books (Textbooks):	Building Construction: Principle, Material & Systems by Dr Madan L Mehta, Walter Scarborough, Diane Armpriest, Pearson Second edition, 2012
Periodicals, Web Sites, … etc:	https://theconstructor.org/construction/project/basics-building-construction/25260/

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO5	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A5	PLO5	√			
A10	PLO10		√		
D1	PLO15			√	
D2	PLO16				√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO5	CLO1	• Presentation	• Reports
A10	PLO10	PO5	CLO2	• Report	• Reports
D1	PLO15	PO5	CLO3	• Lecture • Tutorials	• First ,Second and Exams • Assignments ,Quizzes
D2	PLO16	PO5	CLO4	• Lecture • Tutorials	• First ,Second and Exams • Assignments • Quizzes

Course Coordinator: **Dr Ahmed Abouelfetouh Abdelaziz**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Advanced Engineering Materials	**Code**	CMC507	
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Fall Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Structural Analysis-2 (CMC 202)

: Construction Materials (CMC 204)

Polymers and Epoxies, polymers concrete, types, properties and applications of polymers concrete, Fibers, different types of fibers reinforced concrete, properties, production and applications of fiber reinforced concrete, theory of failure of fiber reinforced concrete, properties of fiber reinforced concrete in compression, tension, bending and shear- Ferro-cement materials, behavior of Ferro-cement under different stresses - Introduction of theories of composite materials, Lightweight aggregate, natural and artificial aggregate, lightweight concrete, Insulating concrete, structural lightweight concrete, properties of lightweight concrete, design mixes of lightweight concrete, failure theories of lightweight concrete under different stresses, Massing and heavy concrete – Special concrete (Refractory concrete, Non shrinkage concrete), Ceramics, Introduction of Egyptian and International Specifications.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Derive different theory to solve problems that related to lightweight and heavy concrete
		CO2	Classify different types of polymers and fibers.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A6	PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO1	Explain polymers and fibers that used in engineering projects
A10	PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO2	Apply new knowledge in advanced engineering materials
D2	PLO16	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	CLO3	Design the mix of lightweight and heavy concrete
			CLO4	Select material that used in concrete to be suitable for environment designs

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1	CLO3,4	CLO2

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to polymers	1	√			
Epoxies	2	√			
Fibers, different types of fibers reinforced concrete	3,4	√	√		√
Properties of fiber reinforced concrete in compression, tension, bending	5	√	√		
Shear- Ferro-cement materials, behavior of Ferro-cement under different stresses	6	√			
First exam	7	√			
Theories of composite materials	8,9			√	
Lightweight concrete	10,11			√	
Second exam	12	√		√	

Massing and heavy concrete	13,14			√	
Introduction of Egyptian and International Specifications	15				√
Final exam	16	√		√	√
Total	**16**	**6**	**4**	**6**	**3**

2.6. Lab Topics:

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture	√		√	√
2. Tutorials			√	√
3. Project-based Learning				√
4. Self-Learning		√		
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	First Exam	√			
	Second Exam	√		√	
	Oral Test		√		√
Assignments				√	√
Report			√		
Summative Assessment Method					
Final Exam		√		√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30 %
	Second Exam	12	20 %
	Oral Test	15	3%
Assignments		3-14	4%
Report		9	3%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Lecture Notes
Essential Books (Textbooks):	Engineering Materials: Properties and Selection by Kenneth G. Budinski, Pearson, 9th Edition, 2017
Periodicals, Web Sites, … etc:	https://onlinelibrary.wiley.com/journal/15272648

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1			√	√
CO2	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A6	PLO6	√			
A10	PLO10		√		
D2	PLO16			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A6	PLO6	PO1	CLO1	• Lecture	• First , Second and Final Exams
A10	PLO10		CLO2	• Self-Learning	• Report • Oral Test
D2	PLO16		CLO3	• Lecture	• Second and Final Exams
				• Tutorials	• Assignments
			CLO4	• Lecture	• Final Exam
				• Tutorials	• Assignments
				• Project-based Learning	• Oral Test

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmad Youssef Kamal El –Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Transportation & Logistics	**Code**	CMC 508	
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	0	3

2. Professional Information:

2.1. Course description:

Transport systems and basic definitions- Introduction to transport planning and management - Transport operations and scheduling - Logistics supply chain management - Vehicle routing and scheduling - Cost elements - Private participation in transport logistics - International technical cooperation in transport logistics - computer applications

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Identify the basic concepts and roles of transportation Logistics for solving problems related to logistics.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	Manage the physical flow of goods, in close cooperation with various partners: suppliers, clients, transporters, and distributors.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO3**	Develop analytical and critical understanding & skills for planning, designing, and operations of the supply chain.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO1	Define the different terms of transportation logistics, transportation infrastructure, and transportation equipment.
			CLO2	Describe the different types of transportation networks.
B2	PLO12	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.	CLO3	Choose a suitable mode of transportation.
			CLO4	Select the transportation routing and scheduling methods.
A3	PLO3	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.	CLO5	Calculate the transportation cost.
			CLO6	Formulate a mathematical model to minimize or maximize the cost by applying linear programming.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to transportation logistics	1	√					
Transportation infrastructure and equipment	2	√					
Transportation Network	3,4		√	√			
Multimodalism transportation	5			√			
Transportation Routing	6				√		
First Exam	7	√	√	√			
Cost analysis of transportation system	8				√	√	
Logistics transportation problems:	9-10						√
Second Exam	12				√	√	√
Assignment and transshipment problems with linear programming	11, 13						√
Application for supply chain management (Automotive transportation logistics)	14					√	√
Computer Application	15						√
Final Exam	16	√	√	√	√	√	√
Total	**16**	**2**	**2**	**2**	**2**	**2**	**6**

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Lecture	√	√	√	√	√	√
Tutorials	√	√	√			
Problem-based Learning				√	√	
Computer-based Instruction						√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	First Midterm Exam	√	√	√			
	Second Midterm Exam				√	√	√
Assignments		√	√	√	√	√	√
Summative Assessment Method							
Final Exam					√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**(First, Second) Exams**	7,12	50 %
Assignments		2 - 6, 8 – 11, and 13 - 15	10%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	According to the lecturer
Essential Books (Textbooks):	Logistics Transportation System by MD Sarder, Elsevier, First Edition, 2021, ISBN: 978-0-12-815974-3.
Periodicals, Web Sites, … etc:	The students can search the internet network for pages which help them to Assign the transshipment problems with linear programming (as a computer application) **As:** **https://studycorgi.com/transshipment-problem-solving-with-linear-programming/**

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO1	√		
PO2		√	
PO5			√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√				
CO2			√	√		
CO3					√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A1	PLO1	√	√				
B2	PLO12			√	√		
A3	PLO3					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Lecture	• First Exam
				• Tutorials	• Assignments
			CLO2	• Lecture	• First Exam
				• Tutorials	• Assignments
B2	PLO12	PO2	CLO3	• Lecture	• First Exam
				• Tutorials	• Assignments
			CLO4	• Lecture	• Second Exam, Final exam
				• Problem-based Learning	• Assignments
A3	PLO3	PO5	CLO5	• Lecture	• Second Exam, Final exam
				• Problem-based Learning	• Assignments
			CLO6	• Lecture	• Second Exam, Final exam
				• Computer-based Instruction	• Assignments

Course Coordinator: **Dr Ahmed Gamal**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Project 1		**Code**	CMC 509
Type	**Compulsory** ☒		**Elective** ☐	
Semester	Fall Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	0	3

2. Professional Information:

2.1. Course Description:

*** The student can register for the Senior Design Project course after passing 70% of the program cr. hrs,**

Topics are selected by groups of students according to their area of interest upon advisor approval. Projects address solutions to open ended applications using an integrated engineering approach. Actual construction projects are selected by groups of students upon advisor approval for analysis. The management and technology aspects of construction are simulated and investigated.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Choose** engineering Work Break down Structure (WBS) of the building work to produce effective steps of project.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	**Study** all elements geometrically & structure of the building according to project management.

PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO3**	**Evaluate** the construction engineering management project.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO4**	**Derive** project scope, and Analyzed contract of the project management items.

2.3. Course Learning Outcomes (CLOs):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A3	**PLO3**	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.	**CLO1**	**Perform** knowledge to help in planning and illustrating the project.
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO2**	**Discuss** the laws and codes of practice, and standards
A6	**PLO6**	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO3**	**Design** the project, taking into consideration the management principles.
A7	**PLO7**	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**CLO4**	**Work** efficiently as a member of the team.

A8	**PLO8**	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO5**	**Use** planning and drawing software programs.
A9	**PLO9**	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO6**	**Solve** technical problems with the engineering skills
A10	**PLO10**	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**CLO7**	**Study** novel systems to solve technical issues and practice self-learning.
B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO8**	**Analyze** structural elements and properties of materials according to project management.
B2	**PLO12**	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	**CLO9**	**Explain** all reinforcement concrete structural elements and properties of materials according to building construction method.

		field relevant to the discipline.		
B3	**PLO13**	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.	**CLO10**	**Illustrate** the building structure, elements and materials according to construction method.
B4	**PLO14**	Deal with biddings, contracts and financial issues including project insurance and guarantees.	**CLO11**	**Select** the suitable tender, contracts, and financial issues.
D2	**PLO16**	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of structural design, construction, technology, and engineering problems	**CLO12**	**Drive** the project presentation including WBS, and activity list.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,9	**CLO1,3,5,6,7,8,10,11,12**	**CLO4**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered											
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9	CLO10	CLO11	CLO12
Introduction of the project steps	1,2	√		√		√	√	√				√	
Project scope	3,4	√	√	√	√	√	√	√	√				√
Studding project document	5		√	√					√	√	√	√	
Contracts and Tendering	6-8		√	√							√	√	√
Creating WBS and activity	9,10		√			√	√	√	√			√	√

list													
Learning primavera	11,12	√	√	√	√	√	√	√	√	√	√		√
Value engineering	13-15	√	√	√	√	√	√	√	√	√	√		√
Final Oral Exam	16				√	√	√	√	√	√	√	√	√
Total	16	9	13	13	7	11	11	11	10	6	9	7	12

2.6 Lab Topics

N.A.

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**											
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**	**CLO10**	**CLO11**	**CLO12**
1. Lecture	√	√							√			
2. Tutorials	√		√		√			√	√	√	√	
3. Discussion					√		√	√	√	√	√	√
4. Project	√		√	√	√	√						
5. Problem-based Learning		√				√						
Teaching and Learning Methods for Students with Special Needs:												
Methods												
1. Discussion Session												
2. Extra Lectures												
3. Provide different levels of books and materials												

2.8 Assessment Methods

Assessment Methods:	**Course LOs Covered**											
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**	**CLO10**	**CLO11**	**CLO12**
Formative Assessment Method												
Discussion	√	√		√	√	√	√	√	√	√	√	√
Assignments	√		√									
Presentations	√		√	√	√	√						
Summative Assessment Method												
Project	√		√	√	√	√						
Final Oral Exam				√	√	√	√	√	√	√	√	√

2.8.1 Assessment Schedule & Grades Distribution

Assessment Method	Week	The weighting of Assessment %
Formative Assessment Method		
Discussion	Every week	25 %
Presentations	Every week	20%
Assignments	3, 6	5 %
Summative Assessment Method		
Project	14	30 %
Final Oral Exam	14	20%
Total		100 %

2.9. List of References:

Course Notes:	• Lectures
Essential Books (Textbooks):	• Shaker elbehary Handbook 2018. • Egyptian code for designing concrete structures ECP203-2020. • Egyptian code for calculating loads ECP202-2012.
Recommended Books:	• Design of RC Structure - DR. Mashhour A. Ghoneim. (vols.1, 2, 3) • Design of Reinforced Concrete by Jack C. McCormac, Russell H. Brown, Wiley, Fifth Edition, 2014. • Reinforced Concrete: Mechanics and Design by James K. Wight, James G. MacGregor, Prentice Hall, Fifth Edition 2008. • Computer Applications in Civil Engineering by Paul D. Spindel, Van Nostrand Reinhold Company. • Concrete and Steel Construction: Quality Control and Assurance by Mohamed A. El-Reedy, CRC press, 2013 • Building Construction: Principles, Materials, & Systems by Madan L Mehta Ph.D., Walter Scarborough, Diane Armpriest, Pearson, 2 Edition, 2012

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives			
	CO1	CO2	CO3	CO4
PO1	√			
PO2		√		
PO4			√	
PO5				√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes											
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9	CLO10	CLO11	CLO12
CO1	√	√								√		
CO2				√	√	√						
CO3							√	√	√			
CO4			√								√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes											
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9	CLO10	CLO11	CLO12
A3	PLO3	√											
A4	PLO4		√										
A6	PLO6			√									
A7	PLO7				√								
A8	PLO8					√							
A9	PLO9						√						
A10	PLO10							√					
B1	PLO11								√				
B2	PLO12									√			
B3	PLO13										√		
B4	PLO14											√	
D2	PLO16												√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
A3	PLO3	PO1	CLO1	Lecture Tutorials	Discussion Assignments
				Project	Project, Presentations
A4	PLO4		CLO2	Lecture Problem-based Learning	Discussion
A6	PLO6	PO5	CLO3	Tutorials	Discussion
				Project	Project, Presentations
A7	PLO7	PO2	CLO4	Project	Discussion, Project, Presentations
AB	PLO8		CLO5	Tutorials	Discussion
				Discussion	
				Project	Presentation, Project, Final Oral Exam
A9	PLO9		CLO6	Problem-based Learning	Discussion
				Project	Presentation, Project, Final Oral Exam
A10	PLO10	PO4	CLO7	Discussion	Discussion, Final Oral Exam
B1	PLO11		CLO8	Tutorials	Discussion
				Discussion	Final Oral Exam
B2	PLO12		CLO9	Lecture Tutorials	Discussion
				Discussion	Final Oral Exam
B3	PLO13	PO1	CLO10	Tutorials	Discussion
				Discussion	Final Oral Exam
B4	PLO14	PO5	CLO11	Tutorials	Discussion
				Discussion	Final Oral Exam
D2	PLO16		CLO12	Discussion	Discussion Final Oral Exam

Course Coordinator: **Dr. Omia Said El Hadidi**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Special Topics in Structural Analysis		**Code**	CMC509
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Fall Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	**3**

2. Professional Information:

2.1. Course description:

Pr.Req. : Structural Analysis-2 (CMC 202)

Numerical Methods in structural analysis: finite difference method and finite element method. Introduction to Plastic analysis of structures: basics, formation of plastic hinges and failure mechanisms

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Analyze different method for structural elements
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	Generate professional behavior, and standards, to develop the failure mechanisms principles.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A6	PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO1	Analyze numerical methods in structural analysis
A10	PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO2	Apply new knowledge in finite element method
D2	PLO16	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	CLO3	Classify different method of failure mechanisms
			CLO4	Formulate the plastic structures to suite environmental projects

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,3,4	CLO2

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to numerical methods in structural analysis	1	√			
Finite difference method	2-4	√	√		
Finite element method	5,6	√	√		
First exam	7	√			
Introduction to plastic analysis of structures	8,9				√
Basics of plastic analysis of structure	10,11				√
Second exam	12	√			√
Formation of plastic hinges	13				√
Failure mechanisms	14,15			√	
Final exam	16	√		√	√
Total	**16**	**6**	**5**	**2**	**5**

2.6. Lab Topics:

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√		√	√
2. Tutorials	√			√
3. Self - Learning		√		
4. Problem-based Learning	√			
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	First Exam	√			
	Second Exam	√			√
	Oral Test		√		
	Quizzes	√			√
Assignments		√			
Report			√		
Summative Assessment Method					
Final Exam		√		√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30 %
	Second Exam	12	20 %
	Oral Test	15	3%
	Quizzes	6,9,10,13	2%
Assignments		3-14	2%
Report		7	3%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Lecture Notes
Recommended Books:	• Structural Analysis by Russell C. Hibbeler, Pearson, 9th Edition, 2014, ISBN-13:978-0-13-394284-2.
	• Dynamics of Structures: Theory and Applications to Earthquake Engineering by Anil K. Chopra
	• George, N. Frantziskonis. "Essentials of the Mechanics of Materials, Second Edition". USA: Destech Publications, Inc. 2013. ISBN 13: 9781605950983
Periodicals, Web Sites, … etc:	• https://www.academia.edu/36638573/Special_Structural_Topics_pdf

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A6	PLO6	√			
A10	PLO10		√		
D2	PLO16			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A6	PLO6	PO1	CLO1	• Lecture • Tutorials	• First , Second and Final Exams • Quizzes
				• Problem-based Learning	• Assignments
A10	PLO10		CLO2	• Self-Learning	• Oral Test • Report
D2	PLO16	PO2	CLO3	• Lecture	• Final Exams
			CLO4	• Lecture	• Second and Final Exams
				• Tutorials	• Quizzes

Course Coordinator: Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmad Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Prefabricated Water and Prestressed Concrete Structures	**Code**	CMC 510	
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	0	3

2. Professional Information:

2.1. Course description:

Pr.Req. : Design of R.C. Structures2 (CMC 409)

Prefabricated concrete: design methods, floor and roof systems, wall panels and construction joints. Concrete water structures: design considerations, water tightness. Construction of circular and rectangular tanks. Pre-stressed concrete: basic principals, methods and systems of prestressing, partial loss of prestressing, analysis and design for flexural, shear and bearing.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Formulate the basic principles of prefabricated and prestressed concrete using a wide spectrum of engineering knowledge.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	Create concrete water structures according to sustainability principles.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO1	Identify the basic principle of prefabricated concrete.
			CLO2	Explain the basic principles, methods and systems of prestressing.
A3	PLO3	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.	CLO3	Apply engineering design processes to produce concrete water structures.
			CLO4	Construct a circular and rectangular tanks with consideration for global, economic, environmental, and other aspects within the principles and contexts of sustainable design and development.
B2	PLO12	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.	CLO5	Design prefabricated and prefabricated concrete.
			CLO6	Analyze a flexural, shear and bearing for prestressed concrete.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to prefabricated concrete.	1	√					
Design floor and roof systems.	2					√	
Wall panels and construction joints.	3					√	
Basic principle of concrete water structures.	4			√			
Design considerations, water tightness	5,6			√			
First Exam	7	√		√		√	
Construction of circular and rectangular tanks	8-10				√		
Basic principle of prestressed concrete	11		√				
Second Exam	12		√		√		
Analysis and design for flexural, shear and bearing	13,14						√
Review .	15	√	√	√	√	√	√
Final Exam	16	√	√	√	√	√	√
Total	**16**	**2**	**2**	**4**	**4**	**3**	**3**

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Lecture	√	√	√	√	√	√
Tutorials			√	√	√	√
Problem-based Learning				√		√
Project-based Learning			√		√	
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	First Exam	√		√		√	
	Second Exam		√		√		√
Assignments				√	√	√	√
Discussion					√		√
Mini Projects				√		√	
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second) Exams	7,12	50 %
Assignments		2-14	4%
Discussion		8-10	2%
Mini Projects		15	4%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	According to the lecturer
Essential Books (Textbooks):	ECP203-2020. Shaker elbehary handbook.
Recommended Books:	Reinforced Concrete: Mechanics and Design by James K. Wight, James G. MacGregor, Prentice Hall, 5 Edition 2008
Web Sites	https://civiltoday.com/civil-engineering-materials

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√			√	√
CO2			√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A1	PLO1	√	√				
A3	PLO3			√	√		
B2	PLO12					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Lecture	• First and Final Exams
			CLO2	• Lecture	• Second and Final Exams
A3	PLO3	PO2	CLO3	• Lecture	• First and Final Exams
				• Tutorials	• Assignments
				• Project-based Learning	• Mini Projects
			CLO4	• Lecture	• Second and Final exams
				• Tutorials	• Assignments
				• Problem-based Learning	• Discussion
B2	PLO12	PO1	CLO5	• Lecture	• First and Final Exams
				• Tutorials	• Assignments
				• Project-based Learning	• Mini Projects
			CLO6	• Lecture	• Final exam
				• Tutorials	• Assignments
				• Problem-based Learning	• Discussion

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Techniques of Planning, Scheduling and Project Control	**Code**	CMC511	
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Fall **Semester** (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	-	3

2. Professional Information:

2.1. Course description:

Pr.Req. : Project Management (CMC 309)

Project definition and work breakdown structure. Scheduling and control models and techniques such as: AOA, AON, bar charting, line of balance. Resource allocation, and optimal schedules. Documentation and reporting, time and cost control, progress monitoring and evaluation and computer applications.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Solve problems with wide sets of knowledge, science, and specialized skills to Scheduling and control models and techniques
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills	**CO2**	Illustrate project definition and explain how to work in and lead a heterogeneous team with entrepreneurial skills

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A6	PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements	CLO1	Define the project and work breakdown structure taking into consideration other trades requirements
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO2	Perform monitoring and evaluation in the project
B4	PLO14	Deal with biddings, contracts and financial issues including project insurance and guarantees.	CLO3	Predict the scheduling and line of balance for the project
			CLO4	Discuss the documentation and reporting
D2	PLO16	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	CLO5	Use the optimal schedules for the project

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,4	CLO3,5	CLO2

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Project definition	1	√				
Work breakdown structure	2	√				
Introduction in Scheduling and control models and techniques	3-4			√		√
AOA techniques	5	√				√
AON techniques	6					√

First exam	7	√				√
Resource allocation, and optimal schedules	8-9	√		√		√
Documentation and reporting	10				√	
Time and cost control	11				√	
Second exam	12			√	√	
Progress monitoring and evaluation and computer applications.	13-15		√			
Final Exam	16	√	√	√	√	√
Total	**16**	**5**	**3**	**4**	**2**	**6**

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√		√	√	√
2. Tutorial	√		√	√	√
3. Project- based learning		√			
4. Presentation				√	
5. Interactive learning		√			
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
1. Tests	First Exam	√				√
	Second Exam			√	√	
2. Reports					√	
3. Mini Projects			√			
4. Observation			√			
Summative Assessment Method						
Final Exam		√		√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30 %
	Second Exam	12	20 %
Reports		13	5%
Mini Projects		15	2%
Observation		13-15	3%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	Lecture Notes
Essential Books (Textbooks):	David Bratt, Fundamentals of Construction Estimating, Cengage Learning; 4th edition (Jan., 2018): ISBN-13: 978-1337399395
Recommended Books:	Popescu C., Phaobunjong K. ,and Ovararin N., "Estimating Building Costs", Book of Marcel Dekker, 2003, Inc. ISBN: 0-8247-4086-6, http://www.dekker.com/

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO3		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1			√		√
CO2	√	√		√	

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A6	PLO6	√				
A9	PLO9		√			
B4	PLO14			√	√	
D2	PLO16					√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A6	**PLO6**	**PO3**	**CLO1**	• Lecture • Tutorial	• First , and Final Exams
A9	**PLO9**		**CLO2**	• Project- based learning • Interactive learning	• Min project • Observation
B4	**PLO14**	**PO1**	**CLO3**	• Lecture • Tutorial	• Second and Final Exams
		PO3	**CLO4**	• Lecture • Tutorial	• Second and Final Exams
				• Presentation	• Reports
D2	**PLO16**	**PO1**	**CLO5**	• Lecture • Tutorial	• First , and Final Exams

Course Coordinator: Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Analysis and Design of Composite Structures	**Code**	CMC 512	
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	3	0	3

2. Professional Information:

2.1. Course description:

Pr.Req. : Design of Metallic Structures-2 (CMC 402)

Theory of composite structures. Analysis and design of simple and continuous girders. Effect of secondary stresses due to slip and uplift at the interface of concrete slab and steel beam. Analysis and design of composite connections. Composite columns. Methods of construction

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Formulate the basic principles of composite structures using a wide spectrum of engineering knowledge.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	Create composite structures suitable to sustainability principles.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A1	PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO1	Identify the basic principle of composite structures.
			CLO2	Explain the effect of stresses due to slip and uplift on the composite structures.
A3	PLO3	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.	CLO3	Apply engineering design processes for composite connections
			CLO4	Illustrate the methods of construction for composite structures.
B2	PLO12	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.	CLO5	Design simple and continuous girders
			CLO6	Analyze simple and continuous girders and column for composite structure.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4,5,6	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Basic principle of composite structures.	1	√					
Analysis of simple and continuous girders	2						√
Design of simple and continuous girders	3,4					√	
Effect of secondary stresses due to slip and uplift at the interface of concrete slab and steel beam	5,6		√				
First Exam	7	√	√			√	√
Analysis of composite connections	8-10			√			√
Design of composite connections	11			√			
Second Exam	12	√	√	√			
Composite columns	13						√
Methods of construction	14,15	√			√		
Final Exam	16	√	√	√	√	√	√
Total	**16**	**2**	**2**	**4**	**2**	**2**	**4**

2.6. Lab Topics:

(Not applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Lecture	√	√	√	√	√	√
Tutorials		√	√		√	√
Problem-based Learning			√		√	√
Project-based Learning					√	
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	First Exam	√	√			√	√
	Second Exam	√	√	√			
Assignments			√	√		√	√
Discussion				√		√	√
Mini Projects						√	
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	(First, Second) Exams	7,12	50 %
Assignments		5-13	4%
Discussion		2-4,8-11	2%
Mini Projects		15	4%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	Lecture Note
Essential Books (Textbooks):	1- Egyptian code for design of steel structure (ASD). 2- Egyptian Code of Practice for Steel Construction (LOAD and RESISTANCE FACTOR DESIGN), (LRFD). 3- Steel structures design by Prof Dr. Abdelrahim Khalil Dessouki, ISBN: 977-5423-65-1, (2018).
Recommended Books:	Analysis and Design of Steel and Composite Structures by Qing Quan Liang, CRC Press, 1 Edition 2014.
Web Sites	https://www.asg.ed.tum.de/en/lcc/education/specialized-courses/analysis-and-design-of-composite-structures/

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO2		√

3.2. Course Objectives VS Course Learning Outcomes

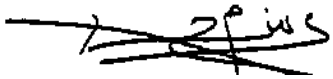
Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√	√		√		√
CO2			√		√	

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A1	PLO1	√	√				
A3	PLO3			√	√		
B2	PLO12					√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A1	PLO1	PO1	CLO1	• Lecture	• First ,Second and Final Exams
			CLO2	• Lecture	• First, Second and Final Exams
				• Tutorials	• Assignments
A3	PLO3	PO2	CLO3	• Lecture	• Second and Final Exams
				• Tutorials	• Assignments
				• Problem-based Learning	• Discussion
		PO1	CLO4	• Lecture	• Final exam
B2	PLO12	PO2	CLO5	• Lecture	• First and Final Exams
				• Tutorials	• Assignments
				• Problem-based Learning	• Discussion
				• Project-based Learning	• Mini Projects
		PO1	CLO6	• Lecture	• First and Final exams
				• Tutorials	• Assignments
				• Problem-based Learning	• Discussion

Course Coordinator: **Dr. Rasha Mohey Al-Deen** 

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen** 

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Project 2		**Code**	CMC 512
Type	**Compulsory** ☒		**Elective** ☐	
Semester	Fall Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	0	6	0	3

2. Professional Information:

2.1. Course Description:

Pr.Req. : Project-1 (CMC 509)

Topics are selected by groups of students according to their area of interest upon advisor approval. Projects address solutions to open ended applications using an integrated engineering approach. Actual construction projects are selected by groups of students upon advisor approval for analysis. The management and technology aspects of construction are simulated and investigated.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Apply** the suitable engineering Work Break down Structure (WBS) of the building work to produce effective steps of project.
PO2	Behave professionally, adhere to engineering ethics and standards, and work to develop the profession and community and promote sustainability principles.	**CO2**	**Design** the different concrete elements geometrically & structure at Value Engineering.
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO3**	**Present** the final construction engineering management project

PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO4**	**Create** the final project scope and the final Analyzed contract of the project management items.

2.3. Course Learning Outcomes (CLOs):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A3	**PLO3**	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.	**CLO1**	**Apply** engineering design processes to produce cost-effective solutions in planning and illustrating the project.
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO2**	**Use** the laws and codes of practice, and standards effectively in the final project
A6	**PLO6**	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO3**	**Supervise** the project, taking into consideration the management principles and other trades requirements
A7	**PLO7**	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**CLO4**	**Work** efficiently with multi-disciplinary and multi-cultural teams.
A8	**PLO8**	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO5**	**Model** the time planning, cost, and survey software programs with a project team using

				contemporary tools.
A9	**PLO9**	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO6**	**Solve** technical management problems using creative, innovative and flexible thinking.
A10	**PLO10**	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**CLO7**	**Study** a new systems with acquire knowledge and other learning strategies to solve technical issues
B1	**PLO11**	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO8**	**Design** the structural project according to cost and time
B2	**PLO12**	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	**CLO9**	**Modify** the final project according to time and cost.

		discipline.		
B3	**PLO13**	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.	**CLO10**	**Prepare** the project management and quality control items.
B4	**PLO14**	Deal with biddings, contracts and financial issues including project insurance and guarantees.	**CLO11**	**Formulate** the safety and financial issues for the project
D2	**PLO16**	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of structural design, construction, technology, and engineering problems	**CLO12**	**Create** the final project presentation including all steps of project.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,5,6,7,8,9,10,11,12	**CLO4**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered											
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9	CLO10	CLO11	CLO12
Introduction of the project steps	1,2	√		√		√	√	√				√	
Project scope	3,4	√	√	√	√	√	√	√	√				√
Studding project document	5		√	√					√	√	√	√	

Contracts and Tendering	6-8		√	√							√	√	√
Creating WBS and activity list	9,10		√			√	√	√	√			√	√
Learning primavera	11,12	√	√	√	√	√	√	√	√	√	√		√
Value engineering	13	√	√	√	√	√	√	√	√	√	√		√
Final Oral Exam	14			√	√	√	√	√	√	√	√	√	√
Total	14	7	11	11	5	9	9	9	8	4	7	8	10

2.6 Lab Topics

N.A.

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**											
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**	**CLO10**	**CLO11**	**CLO12**
1. Tutorials	√		√		√			√	√	√	√	
2. Discussion					√		√	√	√	√	√	√
3. Project	√		√	√	√	√						
4. Problem-based Learning		√				√						
Teaching and Learning Methods for Students with Special Needs:												
Methods												
1. Discussion Session												
2. Extra Lectures												
3. Provide different levels of books and materials												

2.8 Assessment Methods

Assessment Methods:	**Course LOs Covered**											
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**	**CLO10**	**CLO11**	**CLO12**
Formative Assessment Method												
Discussion		√		√	√	√	√	√	√	√	√	√
Assignments	√		√									
Presentations	√		√	√	√	√						
Summative Assessment Method												
Project	√		√	√	√	√						
Final Oral Exam				√	√	√	√	√	√	√	√	√

2.8.1 Assessment Schedule & Grades Distribution

Assessment Method	Week	The weighting of Assessment %
Formative Assessment Method		
Discussion	Every week	25 %
Presentations	Every week	20%
Assignments	3, 6	5 %
Summative Assessment Method		
Project	14	30 %
Final Oral Exam	14	20%
Total		100 %

2.9. List of References:

Course Notes:	• Lectures
Essential Books (Textbooks):	• Shaker elbehary Handbook 2018. • Egyptian code for designing concrete structures ECP203-2020. • Egyptian code for calculating loads ECP202-2012.
Recommended Books:	• Design of RC Structure - DR. Mashhour A. Ghoneim. (vols.1, 2, 3) • Design of Reinforced Concrete by Jack C. McCormac, Russell H. Brown, Wiley, Fifth Edition, 2014. • Reinforced Concrete: Mechanics and Design by James K. Wight, James G. MacGregor, Prentice Hall, Fifth Edition 2008. • Computer Applications in Civil Engineering by Paul D. Spindel, Van Nostrand Reinhold Company. • Concrete and Steel Construction: Quality Control and Assurance by Mohamed A. El-Reedy, CRC press, 2013 • Building Construction: Principles, Materials, & Systems by Madan L Mehta Ph.D., Walter Scarborough, Diane Armpriest, Pearson, 2 Edition, 2012

2.10. Facilities required for Teaching and Learning

Different Facilities	
Lecture Hall	√
Data Show	√
White Board	√

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objectives			
	CO1	CO2	CO3	CO4
PO1	√			
PO2		√		
PO4			√	
PO5				√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes											
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9	CLO10	CLO11	CLO12
CO1	√	√	√									
CO2					√			√	√			
CO3				√		√				√		
CO4							√				√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes											
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9	CLO10	CLO11	CLO12
A3	PLO3	√											
A4	PLO4		√										
A6	PLO6			√									
A7	PLO7				√								
A8	PLO8					√							
A9	PLO9						√						
A10	PLO10							√					
B1	PLO11								√				
B2	PLO12									√			
B3	PLO13										√		
B4	PLO14											√	
D2	PLO16												√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLOs	Teaching M.	Assessment
A3	PLO3	PO1	CLO1	Tutorials	Assignments
				Project	Project, Presentations
A4	PLO4		CLO2	Problem-based Learning	Discussion
A6	PLO6		CLO3	Tutorials	Assignments
				Project	Project, Presentations
A7	PLO7	PO4	CLO4	Project	Discussion, Presentation, Project, Final Oral Exam
A8	PLO8	PO2	CLO5	Tutorials	Discussion
				Discussion	
				Project	Presentation, Project, Final Oral Exam
A9	PLO9	PO4	CLO6	Problem-based Learning	Discussion
				Project	Presentation, Project, Final Oral Exam
A10	PLO10	PO5	CLO7	Discussion	Discussion, Final Oral Exam
B1	PLO11	PO2	CLO8	Tutorials	Discussion
				Discussion	Final Oral Exam
B2	PLO12		CLO9	Tutorials	Discussion
				Discussion	Final Oral Exam
B3	PLO13	PO4	CLO10	Tutorials	Discussion
				Discussion	Final Oral Exam
B4	PLO14	PO5	CLO11	Tutorials	Discussion
				Discussion	Final Oral Exam
D2	PLO16		CLO12	Discussion	Discussion Final Oral Exam

Course Coordinator: **Dr. Omia Said El Hadidi**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Construction Management-2		**Code**	CMC513
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Fall **Semester** (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	3

2. Professional Information:

2.1. Course description:

Pr. Req.: Construction Management (CMC405)

Project procurement. Competitive bidding budgetary control. Preparation of budgets. Type of budget. Classification of costs. The need for cash flow forecasting by contractors. The requirements of forecasting system. Capital lock-up. The factors that affect capital lock-up. Economic assessments. Profitability measures. Inflation. Accuracy of future estimates. Financial modeling. Cost-benefit analysis. Plant acquisition. The financing of plant. Systematic plant selection. Setting hire rates. Plant maintenance.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Evaluate the of budgets by using a wide spectrum of engineering knowledge, and specialized skills with analytic thinking
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills	**CO2**	Predict the financing and maintenance of plant with helping of heterogeneous team and entrepreneurial skills

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A6	PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements	CLO1	Identify the project procurement and the budgets.
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO2	Use creative thinking in forecasting system
B4	PLO14	Deal with biddings, contracts and financial issues including project insurance and guarantees.	CLO3	Analyze the cost-benefit for the project
			CLO4	Determine the Economic assessments for the project
D2	PLO16	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	CLO5	Classify the profitability measures for the project

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1	CLO3,4,5	CLO2

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Project procurement	1	√				
Preparation of budgets	2	√				
The need for cash flow forecasting by contractors	3		√			
The requirements of forecasting system	4		√			
Classification of costs	5,6			√		
First exam	7	√		√		
Cost-benefit analysis	8-9			√		

Economic assessments	10				√	
Inflation, accuracy of future estimates	11				√	
Second exam	12	√		√	√	
Plant acquisition and maintenance	13-15					√
	16	√		√	√	√
Total	**16**	**2**	**2**	**4**	**2**	**3**

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√		√	√	√
2. Tutorial	√		√	√	√
3. Project- based learning		√			
4. Presentation				√	
5. Interactive learning		√			
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
1. Tests	First Exam	√		√		
	Second Exam	√		√	√	
2. Reports					√	
3. Mini Projects			√			
4. Observation			√			
Summative Assessment Method						
Final Exam		√		√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30 %
	Second Exam	12	20 %
Reports		5	5%
Mini Projects		5	3%
Observation		3-4	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	Lecture Notes
Essential Books (Textbooks):	David Bratt, Fundamentals of Construction Estimating, Cengage Learning; 4th edition (Jan., 2018): ISBN-13: 978-1337399395
Recommended Books:	Popescu C., Phaobunjong K. ,and Ovararin N., "Estimating Building Costs", Book of Marcel Dekker, 2003, Inc. ISBN: 0-8247-4086-6, http://www.dekker.com/
	Construction Management by by Kraig Knutson, Clifford J. Schexnayder, Christine Fiori, Richard Mayo, McGraw-Hill Education, 2 Edition 2008
Periodicals, Web Sites, … etc:	https://thedocs.worldbank.org/en/doc/123601488224013672-0290022017/original/ProcurementPPSDShortFormFeb2017.pdf

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	
PO3		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1			√	√	√
CO2	√	√			

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A6	PLO6	√				
A9	PLO9		√			
B4	PLO14			√	√	
D2	PLO16					√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A6	PLO6	PO3	CLO1	• Lecture • Tutorial	• First , Second and Final Exams
A9	PLO9		CLO2	• Project- based learning • Interactive learning	• Min project • Observation
B4	PLO14	PO1	CLO3	• Lecture • Tutorial	• First , Second and Final Exams
			CLO4	• Lecture • Tutorial • Presentation	• Second and Final Exams • Report
D2	PLO16		CLO5	• Lecture • Tutorial	• Final Exam

Course Coordinator: Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Special Topics in Geotechnical Engineering	**Code**	CMC 514	
Type	**Compulsory ☐**	**Elective ☒**		
Semester	**Fall Semester (Fifth Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	**3**

2. Professional Information:

2.1. Course Description:

Pr.Req.: Foundation Engineering (CMC 407)

Foundations on problematic soils, Groundwater movement. Ground water related problems. Underpinning. Bridge foundations. Protection of foundation structures against soils and ground water. Geo environmental fundamentals. Fate and transport of contaminants in the subsurface. Treatment and disposal methods of waste. Land disposal. Site remediation and subsurface characterization Containment.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Apply** wide sets of geotechnical engineering knowledge, science, and specialized skills with analytic thinking to identify and solve problems in real-life situations.
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	**Drive** the best method for Treatment and disposal of waste with the heterogeneous team, and entrepreneurial skills.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	**PLO5**	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO1**	A**pply** research techniques in groundwater-related problems.

A9	**PLO9**	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO2**	**Generate** creative, innovative, and flexible thinking to treatment method of waste and contaminants
B3	**PLO13**	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.	**CLO3**	**Discuss** the safety measures in treatment and disposal methods of waste.
			CLO4	**Study** the environmental impacts of contaminants in the subsurface and problematic soils
B4	**PLO14**	Deal with biddings, contracts and financial issues including project insurance and guarantees.	**CLO5**	**Perform** project insurance and guarantees of land disposal

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO3,4	**CLO5**	**CLO1,2**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction in foundations on problematic soils	1-4				√	
Groundwater movement	5	√				
Ground water related problems	6	√				
First exam	7				√	
Protection of foundation structures against soils and ground water	8	√		√		
Fate and transport of contaminants in the subsurface	9		√			
Treatment and disposal methods of waste	10,11		√	√		
Second exam	12			√	√	
Land disposal	13,14					√
Site remediation	15		√			
Final exam	16			√	√	√
Total	**16**	**3**	**4**	**3**	**4**	**2**

2.6. Lab Topics:

Not applicable.

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
1. Lecture			√	√	√
2. Tutorials			√	√	√
3. Presentation		√			
4. Report	√	√			
5. Problem-based Learning		√			√
6. Self-Learning	√				
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method						
Tests	**First Exam**				√	
	Second Exam				√	√
Assignments				√	√	√
Presentation		√	√	√	√	√
Report		√	√			
Discussion			√			√
Summative Assessment Method						
Final Exam			√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First exam**	7	30 %
	Second exam	12	20 %
Assignments		4,9-10,14	2%
Presentation		6	2 %
Report		9	4%
Discussion		9-11,13	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Essential Books (Textbooks):	• Das, B. M, Principles of Foundation Engineering, Brooks - Cole, 9th. Ed., ISBN 978 – 133 – 770 – 502 – 8, 2017.
Recommended Books:	• Principles of Foundation Engineering by Braja M. Das, CL Engineering, 8Edition, 2015. • El-Kasaby, E. A., Engineering of Surface Foundations, Dar Al-Kutub Al-Almia, Cairo, 5th Ed., (19440/2015), ISBN 978 – 977 – 726 – 139 – 5, 2015. • El-Kasaby, E. A., Design and Construction of Deep and Special Foundations, Dar Al-Kutub Al-Almia, Cairo, 4th Ed., (10651/2016), ISBN 978 – 977 – 726 – 168 – 5, 2016.
Web Sites:	• http://eng.metal.ntua.gr/?course=special-topics-in-geotechnical-engineering

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO1	√	
PO3		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1			√	√	√
CO2	√	√			

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A5	PLO5	√				
A9	PLO9		√			
B3	PLO13			√	√	
B4	PLO14					√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO3	CLO1	Report	Report
				Self-Learning	
A9	PLO9		CLO2	Presentation	Presentation
				Report	Report
				Problem-based Learning	Discussion
B3	PLO13	PO1	CLO3	Lecture	Second and Final Exams
				Tutorials	Assignments
			CLO4	Lecture	First , Second and Final Exams
				Tutorials	Assignments
B4	PLO14		CLO5	Lecture	Final Exam
				Tutorials	Assignments
				Problem-based Learning	Discussion

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Urban Planning		**Code**	CMC515
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Fall **Semester** (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	3

2. Professional Information:

2.1. Course description:

Pr.Req. : Building Construction & City Planning (CMC 307)

This course examines the evolving structure of cities and the way that cities, suburbs, and metropolitan areas can be designed and developed. International cities studied to see how physical, social, political and economic forces interact to shape and reshape cities over time.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Determine the urban planning theories, concepts, the various elements of urban form and the principles that shape the cities.
		CO2	Classify the various analytic tools of urban planning.
		CO3	Modify the theoretical knowledge to real world cases in class assignments and project.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A6	**PLO6**	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements	**CLO1**	Identify the different theories and concepts that shape the cities.
			CLO2	Analyze different elements of urban form to obtain

				design criteria.
			CLO3	Apply the urban planning concepts on a selected area.
A9	**PLO9**	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO4**	Create new solutions through working in teams using imagination and creativity too.
D1	**PLO15**	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies and human sciences	**CLO5**	Choose appropriate solutions for urban planning problems based on analytical thinking
D2	**PLO16**	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of: structural design, construction, technology, and engineering problems	**CLO6**	Analyze urban planning theories into urban spaces while having adequate knowledge of environmental conservation.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1	**CLO2,5,6**	**CLO3,4**

2.5. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Course Introduction	1	√					
Introduction to Town Planning	2	√	√				
History of Town Planning	3	√	√				
Urban Planning Theory	4	√	√				√
Urban Tissue	5		√	√			
Urban Form	6		√	√			
First Exam	7	√	√				
City Structure	8	√				√	√

The Neighborhood: A Residential Environment	9	√	√			√	√
SWOT Analysis	10					√	√
Urban Planning Process	11						
Second Exam	12		√			√	√
Introduction to project	13				√	√	√
Similar project analysis	14				√	√	√
Final sketch & presentation	15				√	√	√
Final Exam	16	√	√	√		√	
Total		8	9	4	3	7	8

2.6 Lab Topics

Not Applicable

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1. Lecture	√	√			√	√
2. Tutorial		√	√		√	√
3. Project- based learning			√	√	√	√
4. Presentation				√		
5. Interactive learning				√		
6. Report	√	√	√			
7. Projects			√		√	
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
1. Tests	First Exam	√	√				
	Second Exam		√			√	√
2. Reports		√	√	√			
3. Observation					√		
4. Project				√	√	√	√
5. Presentation					√		
Summative Assessment Method							
Final Exam		√	√	√		√	

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30 %
	Second Exam	12	20 %
Reports		3,4,9	2%
Observation		13	2%
Project		14	4%
Presentation		14	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Essential Books (Textbooks):	Time Saver Standards for Housing and Residential Development by Joseph De Chiara, Julius Panero, Martin Zelnik, 2017. How to Study Public Life, Jan Gehl, Birgitte Svarre, 2013.
Recommended Books:	إشكالية النسيج والطابع، نسمات عبد القادر، سيد التوني، 1997 Urban Planning by Jordan Yin, W. Paul Farmer, Dummies, 1 Edition, 2012
Web Sites	https://www.britannica.com/topic/urban-planning

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
PO1	√	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
CO1	√		√			
CO2		√				√
CO3				√	√	

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
A6	PLO6	√	√	√			
A9	PLO9				√		
D1	PLO15					√	
D2	PLO16						√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A6	PLO6	PO1	CLO1	● Lecture	● First and Final Exam
				● Report	● Reports
			CLO2	● Lecture	● First, Second and Final Exams
				● Tutorial	
				● Report	● Report
			CLO3	● Tutorial	● Final Exam
				● Project- based learning	● Project
				● Projects	
				● Report	● Report
A9	PLO9		CLO4	● Project- based learning	● Project
				● Interactive learning	● Observation
				● Presentation	● Presentation
D1	PLO15		CLO5	● Lecture	● Second and Final Exam
				● Tutorial	
				● Project- based learning	● Project
				● Projects	
D2	PLO16		CLO6	● Lecture	● Second Exam
				● Tutorial	
				● Project- based learning	● Project

Course Coordinator: Dr. Mona Yehia Shedid

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Total Quality Management	**Code**	CMC 516	
Type	**Compulsory** ☐	**Elective** ☒		
Semester	**Fall Semester (Fifth Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	**3**

2. Professional Information:

2.1. Course Description:

Pr.Req. : Quality Control & Inspection of Structures (CMC 504)

Introduction to quality. Quality improvement techniques. Fundamentals of statistics and probabilities. Control charts for variables and attributes. Lot-by-lot acceptance sampling by attributes. Acceptance sampling systems. Reliability. Cost of poor quality. Total quality management. Computers and quality control.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Apply a wide spectrum of engineering knowledge, and specialized skills to identify and solve Quality improvement techniques problems in real-life situations.
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	Perform the quality improvement techniques with a heterogeneous team and display leadership qualities, and entrepreneurial skills.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO1	Apply research techniques and methods of investigation in total quality management
A9	PLO9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO2	Use creative, innovative, and flexible thinking in quality improvement techniques
B3	PLO13	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.	CLO3	Identify the meaning of quality
			CLO4	Explain the quality improvement techniques
B4	PLO14	Deal with biddings, contracts and financial issues including project insurance and guarantees.	CLO5	Calculate the statistics and probabilities for quality techniques including project insurance and guarantees.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO3,4	CLO5	CLO1,2

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction to quality	1			√		
Quality improvement techniques	2		√		√	
Fundamentals of statistics and probabilities	3		√			√
Control charts for variables and attributes	4					√
Lot-by-lot acceptance sampling by attributes	5,6					√
First exam	7			√	√	√
Acceptance sampling systems, Reliability	8,9		√			√

Total quality management	10,11	√		√	√	
Second exam	12			√		√
Total quality management	13	√			√	
Computers and quality control	14,15					√
Final exam	16			√	√	√
Total	**16**	**2**	**2**	**3**	**3**	**8**

.6. Lab Topics:

Not applicable.

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture			√	√	√
2. Tutorials			√	√	√
3. Presentation	√	√			
4. Report	√	√			
5. Problem-based Learning		√			√
6. Self-Learning	√				
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	**First Exam**			√	√	√
	Second Exam	√		√		√
Assignments				√	√	√
Presentation		√	√			
Report		√	√			
Discussion			√			√
Summative Assessment Method						
Final Exam				√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First exam	7	30 %
	Second exam	12	20 %
Assignments		3,4,8,13	2%
Presentation		9	2 %
Report		9	4%
Discussion		2,3,9,14	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes	• Lecture Notes.
Essential Books (Textbooks):	• Repair of building (2016) By Prof Elsayed Elkasby ISBN: 9789777261401
Recommended Books:	• Total Quality Management by Dale H. Besterfield, Carol Besterfield-Michna, Glen Besterfield, Mary Besterfield-Sacre, Prentice Hall , 3 Edition, 2002
Web Sites	• https://managementstudyguide.com/total-quality-management.htm

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO1	√	
PO3		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1			√	√	√
CO2	√	√			

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A5	PLO5	√				
A9	PLO9		√			
B3	PLO13			√	√	
B4	PLO14					√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO3	CLO1	Report	Report
				Self-Learning	
A9	PLO9		CLO2	Presentation	Presentation
				Report	Report
				Problem-based Learning	Discussion
B3	PLO13	PO1	CLO3	Lecture	Second and Final Exams
				Tutorials	Assignments
			CLO4	Lecture	First , Second and Final Exams
				Tutorials	Assignments
B4	PLO14		CLO5	Lecture	Final Exam
				Tutorials	Assignments
				Problem-based Learning	Discussion

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Value Engineering in the Construction Industry	**Code**	CMC 518	
Type	**Compulsory ☐**	**Elective ☒**		
Semester	**Fall Semester (Fifth Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	**3**	**-**	**3**

2. Professional Information:

2.1. Course Description:

Introduction to value engineering. The value concept: history, definitions, application to the construction industry, incentive provisions in construction contracts, factors to be considered, application to design. Value engineering methodology: information phase, speculative phase, analytical phase, proposal phase, and final report phase. Value engineering study procedures: objective, selecting the input required, required documentation, life cycle cost methodology.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Apply** wide sets of civil engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve problems in real-life situations.
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	**Estimate** the best job plan for the project with the heterogeneous team and display leadership qualities, and entrepreneurial skills.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
B3	PLO13	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.	CLO1	**Explain** The value concept: history, definitions, and application to the construction industry.
			CLO2	**Study** Value engineering methodology: information phase, speculative phase, analytical phase, proposal phase, and final report phase.
B4	PLO14	Deal with biddings, contracts and financial issues including project insurance and guarantees.	CLO3	**Analysis** and draw (FAST) model and its types and function analysis techniques.
A5	PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO4	A**pply** Value engineering study procedures: objective, selecting the input required, required documentation, and life cycle cost methodology.
A9	PLO9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO5	**Estimate** the function cost and choose the best alternative.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1	CLO2,3	CLO4,5

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction to Value history and concepts.	1,2	√				
Value methodology	3,4	√	√			
Value analysis techniques	5,6	√				
First exam	7	√	√			
(FAST) models	8			√		

Estimate function cost	9	√			√	
function analysis techniques	10		√			
Evaluating alternatives	11					√
Second exam	12	√				
Alternatives study	13,14,15		√			√
Final exam	16	√	√	√		
Total		**7**	6	1	1	4

2.6. Lab Topics:

Not applicable.

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√	√	√		
2. Tutorials		√	√		
3. Presentation			√	√	√
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	**First Exam**	√	√			
	Second Exam	√				
Assignments		√	√	√		
Presentation				√	√	√
Report					√	√
Summative Assessment Method						
Final Exam		√	√	√		

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First exam	7	30 %
	Second exam	12	20 %
Assignments		3-6,9-13	5%
Presentation		13,14	2 %
Report		13,14	3%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Essential Books (Textbooks):	1- Value Engineering: Concepts, Techniques and Applications First Edition by Anil Kumar Mukhopadhyaya, 2012. 2- Value Analysis and Engineering Reengineered: The Blueprint for Achieving Operational Excellence and Developing Problem Solvers and Innovators 1st Edition by Abate O. Kassa, **2015.**
Web Sites	https://projectcostsolutions.com/how-value-engineering-is-used-in-construction-projects/

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO1	√	
PO3		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1	√	√	√		
CO2				√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A5	PLO5				√	
A9	PLO9					√
B3	PLO13	√	√			
B4	PLO14			√		

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
B3	**PLO13**	**PO1**	**CLO1**	• Lecture	• First , Second and Final Exams
			CLO2	• Lecture • Tutorials	• First , and Final Exams • Assignments
B4	**PLO14**	**PO3**	**CLO3**	• Lecture • Tutorials • Presentation	• Final Exam • Assignments • Presentation
A5	**PLO5**		**CLO4**	•Presentation	• Presentation • Report
A9	**PLO9**		**CLO5**	•Presentation	• Presentation • Report

Course Coordinator: Dr. Mostafa Abd Elsalam

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management				
Department Offering the course	Construction Engineering and Management				
Date of Specification Approval	**5/9/2023**				
Course Title	**Equipment for Construction**			**Code**	**CMM506**
Type	**Compulsory ☒**		**Elective ☐**		
Semester	**Spring Semester**(Fifth Level)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**	
	2	**1**	**0**	***2***	

2. Professional Information:

2.1. Course description:

Engineering fundamentals of moving earth. Tractors and related equipment; tractors, bulldozers, clearing land, and ripping rock. Scrapers. Excavating equipment; draglines, clamshells, hydraulic excavators, loaders, and trenching machines. Trucks and wagons. Belt conveyor systems. Piles and pile driving equipment. The production of crushed stone aggregate. Cranes; derrick cranes, mobile cranes, and tower cranes.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills	**CO1**	**Evaluate** the equipment and methods for construction of projects, to help in business administration and entrepreneurial skills
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools	**CO2**	**Select** the equipment and methods for construction of projects, including design of formwork, trench supports, and cofferdams.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A5	**PLO5.**	Practice research techniques and methods of investigation as an inherent part of learning	**CLO1**	**Apply** knowledge of mathematics, science, and engineering to evaluation of equipment and methods for construction of projects.

			CLO2	**Identify the** selection of equipment and methods for construction of projects
B3	**PLO13.**	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	**CLO3**	**Apply** engineering fundamentals and analyses to the planning, selection, and utilization of construction equipment. Through understanding of: The total construction process, from inspection of the idea through construction and start up.
			CLO4	**Select** the most cost-effective manner to produce the intended quality

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2	**CLO3,4**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Engineering fundamentals of moving earth.	**1**			√	√
Earth-moving equipment–Backhoe, shovel, scraper, Excavating equipment; draglines, clamshells, hydraulic excavators, loaders, and trenching machines	**2**			√	√
Earth-compacting equipment–Rollers, bulldozers	**3**			√	√
Hauling equipment–dumpers, trucks, tippers	**4**			√	√
Cost of owning and operating construction equipment	**5**			√	
Conveying equipment–Belts, cables, conveyors	**6**			√	√
First Exam	**7**			√	√
Internal combustion engine and fundamentals of hydraulic circuits	**8**	√	√		
Hoisting equipment–Crane (; derrick cranes, mobile cranes, and tower cranes), forklift	**9**			√	√
Aggregate production equipment-Jaw crusher, Gyratory crusher, Cone crusher	**10**			√	√
Equipment's concrete works –Agitation trucks, RMC plant or batching plants.	**11**			√	√
Second Exam	**12**			√	√
Pile-driving equipment–Single & double acting	**13,14**	√	√		

hammer, drop hammer, diesel hammer					
Construction equipment maintenance & Equipment life and replacement procedures	**15**	√	√		
Final Exam	**16**			√	√
Total		**3**	**3**	**9**	**8**

2.6 Lab Topics

N.A.

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lectures			√	√
2. Tutorials			√	√
3. Discussions			√	√
4. Presentation	√	√		
5. Report	√	√		
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**
Tests	**First Exam**			√	√
	Second Exam			√	√
	Quizzes			√	√
Reports		√	√		
Discussions				√	√
Presentations		√	√		
Summative Assessment Method					
Final Exam				√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First Exam	7	30%
	Second Exam	12	20%
	Quizzes	6,11	2.5%
Discussion		11	2.5 %
Presentations		15	2.5 %
Reports		15	2.5%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	Lectures and presentations
Essential Books (Textbooks):	R. Peurifoy, Construction planning, equipment and methods, ninth edition, 2018
Recommended Books:	Leonhard E. Bernold, Construction equipment and methods: planning, innovation, safety, 2013.

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1			√	√
CO2	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A5	PLO5	√	√		
B3	PLO13			√	√

3.4. Assessment Alignment Matrix

SC	PLOs	POs	CLOs	Teaching M.	Assessment M.
A5	PLO5	PO5	CLO1	Presentation. Report.	Report. Presentation.
			CLO2	Presentation. Report.	Report. Presentation.
B3	PLO13	PO3	CLO3	Lectures Tutorials. Discussions	First , Second and Final exams. Quizzes. Discussions.
			CLO4	Lectures Tutorials. Discussions	First , Second and Final exams. Quizzes. Discussions.

Course Coordinator: **Dr. Ahmed Saied Faheim El-Saaey**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Field Training I		**Code**	CMC/E380
Type	**Compulsory** ☒		**Elective** ☐	
Semester	80 Credit Hours			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
				0

2. Professional Information:

2.1. Course description:

**** Completion of 80 Credit Hours**

Putting information and abilities into practice is the main goal of this field training. It equips students with the abilities needed for employment in his field of construction engineering specialization. Internships in businesses are crucial for gaining a thorough understanding of a preparation for future employment. The field experience is a crucial component of education and one of the essential prerequisites for a successful course of study. The students should receive understanding of field-relevant areas of their courses as well as insights into engineering practice. The trainees should demonstrate a keen interest in the organization's professional structures. After the commencement of training, the compliance with the guidelines for the internship is verified.

2.2. Course Objectives (CO):

At the end of course, the student will be able to:

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills	**CO1**	Understand their skills, and strengths, to be able to choose a suitable training experience.in a heterogeneous team
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields.	**CO2**	Describe the gained knowledge ; and practice self, lifelong and other learning strategies.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A7	PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	CLO1	Work in individual and as a member of multi-disciplinary and multicultural teams within constraints.
A10	PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO2	Identify the tasks, time, and resources Effectively.
			CLO3	Apply new knowledge in construction engineering concepts
B3	PLO13	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.	CLO4	Use modern techniques in construction application

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2	CLO3,4	CLO1

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Discussion				√
2. Case Study			√	√
3. Report	√	√	√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.6 Assessment Methods

Assessment Methods:	Course LOs Covered			
	CLO1	CLO2	CLO3	CLO4
1. Report	√	√		
2. Presentation	√	√		
3. Oral Test			√	√

- The field training is evaluated on pass / fail basis and does not count in the cumulative GPA calculation.

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A7	PLO7	√			
A10	PLO10		√	√	
B3	PLO13				√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A7	PLO7	PO3	CLO1	• Report	• Presentation • Report
A10	PLO10		CLO2	• Report	• Presentation • Report
		PO4	CLO3	• Case Study • Report	• Oral Test
B3	PLO13		CLO4	• Case Study • Discussion	• Oral Test

Course Coordinator: Dr. : Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmed Youssef

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Field Training II		**Code**	CMC/E480
Type	**Compulsory** ☒		**Elective** ☐	
Semester	120 Credit Hours			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
				0

2. Professional Information:

2.1. Course description:

*****Completion of 120 Credit Hours**

Putting information and abilities into practice is the main goal of this field training. It equips students with the abilities needed for employment in his field of construction engineering specialization. Internships in businesses are crucial for gaining a thorough understanding of a preparation for future employment. The field experience is a crucial component of education and one of the essential prerequisites for a successful course of study. The students should receive understanding of field-relevant areas of their courses as well as insights into engineering practice. The trainees should demonstrate a keen interest in the organization's professional structures. After the commencement of training, the compliance with the guidelines for the internship is verified.

2.2. Course Objectives (CO):

At the end of course, the student will be able to:

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills	**CO1**	Develop technical, and interpersonal, skills, and display leadership qualities, and entrepreneurial skills
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic / professional fields.	**CO2**	Apply new knowledge interchangeably; and practice self, lifelong and other learning strategies.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A7	PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	CLO1	Work in stressful environment and within constraints.
A10	PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO2	Manage tasks, time, and resources Effectively.
			CLO3	Study construction engineering concepts to real-life problems
B3	PLO13	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.	CLO4	Use appropriate construction techniques and materials to specify and implement different designs.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO3	CLO2,4	CLO1

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Discussion				√
2. Case Study			√	√
3. Report	√	√	√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.6 Assessment Methods

Assessment Methods:	Course LOs Covered			
	CLO1	CLO2	CLO3	CLO4
1. Report	√	√		
2. Presentation	√	√		
3. Oral Test			√	√

- The field training is evaluated on pass / fail basis and does not count in the cumulative GPA calculation.

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A7	PLO7	√			
A10	PLO10		√	√	
B3	PLO13				√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A7	PLO7	PO3	CLO1	• Report	• Presentation • Report
A10	PLO10	PO3	CLO2	• Report	• Presentation • Report
A10	PLO10	PO4	CLO3	• Case Study • Report	• Oral Test
B3	PLO13	PO4	CLO4	• Case Study • Discussion	• Oral Test

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmed Youssef**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management				
Department Offering the course	Construction Engineering and Management				
Date of Specification Approval	**5/9/2023**				
Course Title	Specifications and Feasibility Studies		**Code**	HS501	
Type	**Compulsory** ☐		**Elective** ☒		
Semester	Fall Semester (Fifth Level)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**	
	2	----	---	2	

2. Professional Information:

2.1. Course description:

Methods for retrieving quantities, methods for accounting and cost analysis, Preparation of quotations, Preparation of conditions and specifications, Applications and case studies, Management: basics types of projects. Definition of feasibility study, Project development procedure, Project-environment relation, Basic feasibility studies (marketing, regulation, environment, and technical) Comparison of alternatives, Economical analysis, Project evaluation, Applications.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO1**	Design the project with analysis the national impact of the project on the economy, and the society with working in a heterogeneous team .
PO4	Master self-learning and life-long learning strategies to communicate effectively in the academic/professional field	**CO2**	Evaluate the importance of conducting a feasibility study prior to any major investment project with illustration to the nature and scope of a project feasibility study using life-long learning strategies to communicate effectively in the professional field

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A8	PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	CLO1	Determine the components of the technical feasibility study.
			CLO2	Illustrate the need to determine the project impact on the national economy and society.
			CLO3	Identify the major sources of project capital structure and the characteristics of each source
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO4	Analyze the financial situation for the viability of the project using the flexible thinking.
			CLO5	Design the framework for a sound project feasibility study using creative thinking

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,3	CLO1,4,5	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction to Specifications and Feasibility Studies	1,2	√				
Preparation of quotations	3			√		
Preparation of conditions and specifications	4,5	√		√		
Definition of feasibility study	6	√				
First Exam	7	√		√		
Project development procedure	8		√			
Project-environment relation	9		√			
Basic feasibility studies (marketing, regulation, environment, and technical)	10	√				√
Comparison of alternatives	11					√
Second Exam	12	√	√	√		

Project evaluation	13		√		√	√
Applications and case studies	14, 15				√	√
Final Exam	16	√	√	√	√	√
Total	**16**	**6**	**3**	**3**	**3**	**5**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√	√	√		
2.Discussion		√			
3. Project-based Learning					√
4. Hybrid Learning				√	√
5.Case Study					√
Teaching and Learning Methods for Students with Special Needs:					
Methods					
1. Discussion Session					
2. Extra Lectures					
3. Provide different levels of books and materials					

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	**First Exam**	√		√		
	Second Exam	√	√	√		
Report			√		√	
Mini Projects						√
Summative Assessment Method						
Final Exam		√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Report		13	3%
Mini Projects		15	7%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Lecture notes
Recommended Books:	Feasibility Studies Made Simple, Rodney Overton 2007, I SBN 978-1-921360-32-9
Periodicals, Web Sites, … etc:	https://www.investopedia.com/terms/f/feasibility-study.asp

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
CO1				√	√
CO2	√	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes				
		CLO1	CLO2	CLO3	CLO4	CLO5
A8	PLO8	√	√	√		
A9	PLO9				√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A8	PLO8	PO4	CLO1	• Lecture	• First, Second and Final Exams
			CLO2	• Lecture	• Second and Final Exams
				• Discussion	• Report
			CLO3	• Lecture	• First, Second and Final Exams
A9	PLO9	PO3	CLO4	• Hybrid Learning	• Final Exam
			CLO5	• Project-based Learning	• Min-Project
				• Case Study	
				• Hybrid Learning	• Final Exam

Course Coordinator: Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Professional Communication Skills	**Code**	HS502	
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	----	---	2

2. Professional Information:

2.1. Course description:

Communication as a tool, Developing and maintaining open channels of communication, Reading: understanding the written word. Writing: conveying a clear message through written communication. Listening: active participation in the listening process to ensure the total sharing of meaning. Speaking: conveying a clear and effective message through the spoken word.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO1**	Describe communication strategies in academic/professional fields.
PO5	Apply analytical, experimental, design, construction engineering techniques and project management skills with proficiency aided by modern tools.	**CO2**	Formulate the fundamentals of communication skills.

2.3. Course Learning Outcomes (CLO's):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO1**	Create clear, coherent, focused and grammatically correct written assignments and presentations
			CLO2	Use different presentation tools in professional presentations

A8	**PLO8**	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	**CLO3**	Apply strategies to improve communication especially in meetings,
			CLO4	Use the discursive and integrative online communication skills (utilize blogs, forum, Moodle),

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
	CLO1,2,3,4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to communication.	1				√
Developing and maintaining open channels of communication	2,3			√	√
Reading: understanding the written word	4-6				√
First Exam	7			√	√
Writing: conveying a clear message through written communication.	8-10	√		√	
Listening: active participation in the listening process to ensure the total sharing of meaning	11				√
Second Exam	12	√			√
Listening: active participation in the listening process to ensure the total sharing of meaning	13				√
Speaking: conveying a clear and effective message through the spoken word	14,15		√		√
Final Exam	16	√	√	√	√
Total	**16**	**3**	**2**	**5**	**10**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture		√	√	√
2.Discussion			√	
3. Hybrid Learning	√			
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**			√	√
	Second Exam	√			√
Discussion				√	
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Discussion		2,3	10%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Lecture notes
Recommended Books:	Communication Skills: A Practical Guide to Improving Your Social Intelligence, Presentation, Persuasion and Public Speaking (Master Your Communication and Social Skills) , 2015, ISBN 1515031918
Periodicals, Web Sites, … etc:	https://www.indeed.com/career-advice/resumes-cover-letters/communication-skills

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO4	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√		
CO2			√	√

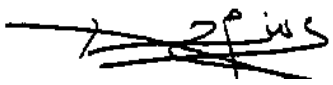
3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A4	PLO4	√	√		
A8	PLO8			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO4	PO5	CLO1	• Hybrid Learning	• Second, and Final Exams
			CLO2	• Lecture	• Final Exam
A8	PLO8	PO4	CLO3	• Lecture	• First and Final Exams
				• Discussion	• Discussion
			CLO4	• Lecture	• First ,Second and Final Exams

Course Coordinator: **Dr. Rasha Mohey Al-Deen**



Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Analytical Skills and Critical Thinking	**Code**	HS503	
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Fall Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	----	---	2

2. Professional Information:

2.1. Course description:

Evaluation of reasoning, Recognition and evaluation of assumptions, Clarification of expressions and ideas, Production of pieces of reasoning appropriate to given task, Identification of reasons and explanations, Ethical concepts, Complex issues, Ethical problems facing leaders, Ethical outcomes in the corporate-level decision-making process, Identification of the ethical dimension in the process of formulating and implementing engineering policies and strategies.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO3.	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO1**	Illustrate expressions, ideas, and the production of pieces of reasoning that are appropriate to display leadership qualities, business administration, and entrepreneurial skills
PO4	Master self-learning and life-long learning strategies to communicate effectively in the academic/professional field	**CO2**	Demonstrate the Ethical concepts and dimensions in the process of formulating and implementing engineering policies and strategies (self-learning and life-long learning strategies).

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A8	PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	CLO1	Identify the Ethical concepts and how to Communicate effectively – with a range of audiences
			CLO2	Identify the ethical dimension in the process of formulating and implementing engineering policies and strategies.
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO3	Present ideas that are appropriate to display leadership qualities
			CLO4	Predict the Complex issues, and ethical problems that are facing leaders

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Analytical Skills	1	√			
Critical Thinking Evaluation of reasoning	2	√			
Recognition and evaluation of assumptions	3	√			
Ethical problems facing leaders,	4				√
Identification of reasons and explanations, Ethical concepts,	5	√			
Production of pieces of reasoning appropriate to given task.	6	√			
First Exam	7	√			
Ethical outcomes in the corporate-level decision making process	8,9	√	√		
Identification of the ethical dimension in the process of formulating.	10	√	√		
Implementing engineering policies and strategies.	11		√		
Second Exam	12	√	√		
Clarification of expressions and ideas ,Complex	13				√

issues					
ideas that are appropriate to display leadership qualities	**14, 15**			√	
Final Exam	**16**	√	√		√
Total		**8**	**3**	**2**	**2**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture	√	√		
2.Report			√	
3. Hybrid Learning				√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	**First Exam**	√			
	Second Exam	√	√		
Report				√	
Summative Assessment Method					
Final Exam		√	√		√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		**Week**	**The weighting of Assessment %**
Formative Assessment Method			
Tests	**First, Second Exams**	7,12	50 %
Report		14,15	10%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Lecture notes
Essential Books (Textbooks):	Critical Thinking Skills Developing Effective Analysis and Argument by Stella (z-lib.org),2015.
Periodicals, Web Sites, … etc:	**https://www.indeed.com/career-advice/career-development/analytical-thinking-vs-critical-thinking**

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1			√	√
CO2	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A8	PLO8	√	√		
A9	PLO9			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A8	PLO8	PO4	CLO1	• Lecture	• First, Second and Final Exams
			CLO2	• Lecture	• Second and Final Exams
A9	PLO9	PO3	CLO3	• Report	• Report
			CLO4	• Hybrid Learning	• Final Exam

Course Coordinator: **Dr. Mohamed R. Ali** mohamed

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Principles of industrial health		**Code**	**HS504**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	**Spring Semester (Fifth Level)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	0		**2**

2. Professional Information:

2.1. Course description:

Principles of protecting health of workers, environmental and chemical monitoring, risk assessment and occupational epidemiology, elements of physiology and toxicology.

2.2. Course **Objectives (CO):**

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Evaluate the general rules for the safety of the industrial environment
		CO2	Apply techniques of safe materials handling and explain the concepts used in industrial health

2.3. Course Learning Outcomes (CLO's):

Student Competences	**Program Learning Outcomes**		**Course Learning Outcomes**	
A5	**PLO5**	Practice research techniques and methods of investigation as inherent part of learning.	**CLO1**	Evaluate workplace to determine the existence of occupational safety and health hazards
			CLO2	Explain the basics of environmental and chemical monitoring and mitigation strategies in industry
A9	**PLO9**	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO3**	Analyze hazards and risk assessment of the project
			CLO4	Identify elements of physiology and toxicology

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO2,4	CLO 1,3	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Principles of Industrial Health	1-2	√			
Environmental Monitoring and Mitigation	3	√			
Monitoring approaches complementing or substituting direct measurement of emissions	4		√		
Optimizing costs of environmental monitoring	5		√		
Explain the aims of workplace inspections and how to report, record and investigate possible hazards.	6		√		
First mid exam	7	√	√		
Describe the most common hazards affect workers in different environments and the factors associated with the occurrence of disease.	8-10		√	√	
Establish a risk management and monitoring system in the workplace.	11			√	
Second mid exam	12		√	√	
Analyze hazards and risk assessment of the project	13-14			√	√
Manage work-related stress	15				√
Final Exam	16	√	√	√	√
Total	**16**	**3**	**6**	**6**	**3**

2.6 Lab Topics

NA

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
Hybrid Learning	√	√	√	√
Interactive Learning		√		√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**	√	√		
	Second Exam		√	√	
Observation			√		√
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	**First Exam**	7	30%
	Second Exam	12	20%
Interactive Learning		6,9-11,13,14	10%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.8. List of Reference:

Course Notes:	Lecture Notes
Essential Books (Textbooks):	Charles D. Reese, Occupational Safety and Health (Fundamental Principles and Philosophies), 2017 by CRC Press.
Recommended Books:	Benjamin O. ALLI, PRINCIPLES OF OCCUPATIONAL HEALTH AND SAFETY, Second edition, 2008, INTERNATIONAL LABOUR OFFICE, GENEVA.
Periodicals, Web Sites, … etc:	**https://www.slideshare.net/JessicaJordan38/introduction-to-industrial-hygiene-1?qid=fdc2d3bc-9f1b-4aad-ad36-4687067748d0&v=&b=&from_search=1**

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√		√	
CO2		√		√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A5	PLO5	√	√		
A9	PLO9			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A5	PLO5	PO1	CLO1	Hybrid Learning	First and Final Exams
			CLO2	Hybrid Learning	First, Second and Final Exams
A9	PLO9		CLO3	Hybrid Learning	Second and Final Exams
				Interactive Learning	Observation
			CLO4	Hybrid Learning	Final Exams
				Interactive Learning	Observation

Course coordinator: Prof. Elsayed Fouad

Program Coordinator: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Communication laws and Codes		**Code**	HS505
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Fall Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	----	---	2

2. Professional Information:

2.1. Course description:

Codes for communication and electronic commerce activities. Laws and codes for intellectual rights for communications, internet and electronic signature. Laws and rules concerning the use of electronic equipment. Safety rules for communication systems and electronic equipment. Rules and conditions for installing mobile base stations. Laws and rules of communication regularization authorities.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO1**	Evaluate the type of regulatory measures appropriate for different forms of communication and the role of international law (hard and soft) for this field with working in a heterogeneous team and entrepreneurial skills .
PO4	Master self-learning and life-long learning strategies to communicate effectively in the academic/professional field	**CO2**	Demonstrate a deeper understanding of the legal issues arising in the communications industry (including user/consumer perspectives) using life-long learning strategies to communicate effectively in the professional field

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A8	PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	CLO1	Identify the communication and electronic commerce activities
			CLO2	Describe the safety rules for communication systems
A9	PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO3	Analyze the importance of Intellectual Property Rights (IPR) in the media environment
			CLO4	Evaluate the impact of new media technologies on IPR

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2	CLO3,4	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to communication.	1,2	√			
Codes for communication and electronic commerce activities.	3,4	√			
Safety rules for communication systems and electronic equipment	5,6		√		
First Exam	7	√	√		
Laws and codes for intellectual rights for communications.	8	√		√	
Laws and codes for intellectual rights for internet and electronic signature.	9			√	
Laws and rules concerning the use of electronic equipment	10			√	
Rules and conditions for installing mobile base stations	11			√	
Second Exam	12	√		√	
Laws and rules of communication regularization authorities.	13-15				√
Final Exam	16	√	√	√	
Total	**16**	**5**	**2**	**4**	**3**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√		
2.Discussion		√		
3.Report				√
4. Hybrid Learning			√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**	√	√		
	Second Exam	√		√	
Report					√
Discussion			√		
Summative Assessment Method					
Final Exam		√	√	√	

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Report		15	8%
Discussion		5,6	2%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Lecture notes
Essential Books:	Communication and the Law , W. Wat Hopkins ,2021 Edition, ISBN 1885219911, 9781885219916

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

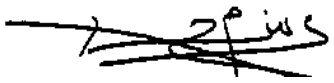
Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1			√	√
CO2	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A8	PLO8	√	√		
A9	PLO9			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A8	PLO8	PO4	CLO1	• Lecture	• First, Second and Final Exams
			CLO2	• Lecture	• First, and Final Exams
				• Discussion	• Discussion
			CLO3	• Hybrid Learning	• Second and Final Exams
A9	PLO9	PO3	CLO4	• Report	• Report

Course Coordinator: **Dr. Rasha Mohey Al-Deen** 

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen** 

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Social Risks and Computer Security	**Code**	HS506	
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	----	---	2

2. Professional Information:

2.1. Course description:

Social implication of networked communication and the Internet, Risks and liabilities of safety-critical systems, Privacy and civil liberties, Computer crimes, Economic issues in computing, Methods and tools for safety and security.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO1**	Demonstrate knowledge of operational and organization security strategies in academic and professional fields.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO1**	Describe legal and public relations implications of security and privacy issues
			CLO2	Define an information security strategy and architecture
A8	**PLO8**	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	**CLO3**	Demonstrate knowledge of security threats
			CLO4	Present a disaster recovery plan for recovery of information assets after an incident

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2,3,4		

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Social Risks and Computer Security	1,2		√		
Social implication of networked communication and the Internet	3,4		√		
Risks and liabilities of safety-critical systems	5,6	√			√
First Exam	7	√	√		√
Privacy and civil liberties	8-10		√		√
Computer crimes	11			√	
Second Exam	12		√	√	√
Economic issues in computing	13		√		
Methods and tools for safety and security	14,15	√		√	
Final Exam	16	√	√	√	√
Total	**16**	**4**	**8**	**3**	**5**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture		√	√	
2.Discussion		√		
3. Hybrid Learning	√			√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	**First Exam**	√	√	√	
	Second Exam		√	√	√
Discussion			√		
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		**Week**	**The weighting of Assessment %**
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Discussion		3,4,9,10,13	10%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Lecture notes
Recommended Books:	Computer Security, Principles and Practice, Third Edition, William Stallings, Lawrie Brown , 2015, ISBN 978-0-13-377392-7

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective
	CO1
PO4	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A4	PLO4	√	√		
A8	PLO8			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO4	PO4	CLO1	• Hybrid Learning	• First , and Final Exams
			CLO2	• Lecture	• First , Second, and Final
				• Discussion	• Discussion
A8	PLO8		CLO3	• Lecture	• First and Final Exams
			CLO4	• Hybrid Learning	• Second and Final Exams

Course Coordinator: **Dr. Rasha Mohey Al-Deen**

Head of Department: **Dr. Ahmed Youssef Kamal El-Deen**

Date: **5/9/2023**

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Construction Contracts and Law		**Code**	HS505
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Fall Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	----	---	2

2. Professional Information:

2.1. Course description:

Principles and basics of construction contorting. Types of construction contracts, selection of construction contract, Contract documents, example of some international contract forms, project delivery systems, introduction to building and construction law, Legal aspects associated with construction projects, Claims.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO1**	Study the fundamentals of contracting and law and its application to the construction industry.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A8	**PLO8**	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	**CLO1**	Identify different kinds of construction contracts
			CLO2	Discuss the potential legal issues associated with alternative project delivery systems
A9	**PLO9**	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new	**CLO3**	Discuss the contract administration such as claims and disputes, change orders and progress payments
			CLO4	Evaluate the ability to review

		situations.		and make construction contracts and specifications

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2,3	**CLO4**	

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Principles and basics of construction contorting	1,2	√			
Types of construction contracts selection of construction contract	3,4	√			
Contract documents	5,6			√	
First Exam	7	√		√	
Introduction to building and construction law	8	√	√		
Legal aspects associated with construction projects	9		√		√
Claims	10			√	
Second Exam	12		√		√
Project delivery systems	13,14			√	√
Review	15	√	√	√	√
Final Exam	16	√	√	√	√
Total	**16**	**6**	**3**	**6**	**4**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√		
2.Discussion		√		
3. Hybrid Learning			√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	**First Exam**	√		√	
	Second Exam		√		√
Discussion			√		
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		**Week**	**The weighting of Assessment %**
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Discussion		8,9	10%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of Reference:

Course Notes:	Lecture notes
Essential Books:	Smith, Currie & Hancock's Common Sense Construction Law: A Practical Guide for the Construction Professional, 2020, 6th Edition, ISBN 1119540178

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective
	CO1
PO3	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A8	PLO8	√	√		
A9	PLO9			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A8	PLO8	PO3	CLO1	• Lecture	• First, and Final Exams
			CLO2	• Lecture	• Second, and Final Exams
				• Discussion	• Discussion
			CLO3	• Hybrid Learning	• First and Final Exams
A9	PLO9		CLO4	• Hybrid Learning	• Second and Final Exams

Course Coordinator: Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023

Course Specification

1. Basic Information:

Program Title	Construction Engineering and Management			
Department Offering the course	Construction Engineering and Management			
Date of Specification Approval	**5/9/2023**			
Course Title	Risk Management		**Code**	HS508
Type	**Compulsory** ☐	**Elective** ☒		
Semester	Spring Semester (Fifth Level)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	----	---	2

2. Professional Information:

2.1. Course description:

Introduction. Risk Definition and Accident Theory. Principle of Risk Management: Identification of Risks. Preliminary Risk Analysis (PRA). Failure Modes, Effect and Criticality Analysis (FMECA). HAZOP. Methods of System Analysis. What is Risk Assessment. Risk Control. Apply hierarchy of Control. Monitoring and Review. The Process of Fire Risk Management. Regulations and agencies, non-governmental organizations, fires and explosions, pressure relief systems, process.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO1**	Demonstrate knowledge of operational and organization security strategies in academic and professional fields.

2.3. Course Learning Outcomes (CLO's):

Student Competences	Program Learning Outcomes		Course Learning Outcomes	
A4	**PLO4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO1**	Identify the conditions and specification standards associated with risk management and communications
			CLO2	Explain the risk management in various industrial and business environments

A8	**PLO8**	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	**CLO3**	Demonstrate skills to assess and communicate risks
			CLO4	Discuss the action plans appropriate for augmenting, promoting and maintaining risk management programs including communications.

2.4. Course Learning Outcomes VS Three Domains of Learning

Cognitive	Psychomotor	Affective
CLO1,2,3,4		

2.5. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Risk Definition and Accident Theory	1,2		√		
Principle of Risk Management	3,4		√		
Preliminary Risk Analysis (PRA).	5,6			√	
First Exam	7		√	√	
Failure Modes, Effect and Criticality Analysis (FMECA).	8	√			
Risk Assessment	9,10				√
Hierarchy of Control	11				√
Second Exam	12	√			√
The Process of Fire Risk Management	13	√	√		
Fires and explosions, pressure relief systems, process.	14,15		√	√	
Final Exam	16	√	√	√	√
Total	**16**	**2**	**7**	**4**	**3**

2.6. Lab Topics:

(Not Applicable**)**

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√		√
2.Discussion		√		
3. Hybrid Learning			√	
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				
2. Extra Lectures				
3. Provide different levels of books and materials				

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**First Exam**		√	√	
	Second Exam	√			√
Discussion			√		
Summative Assessment Method					
Final Exam		√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Formative Assessment Method			
Tests	First, Second Exams	7,12	50 %
Discussion		3,4,9,13,14	10%
Summative Assessment Method			
Final Exam		16	40 %
Total			100 %

2.9. List of References:

Course Notes:	Lecture notes
Recommended Books:	The Essentials of Risk Management, Michel Crouhy , Second Edition, 2014, ISBN 0071818510

2.10. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective
	CO1
PO4	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
CO1	√	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Student Competences	Program Learning Outcomes	Course Learning Outcomes			
		CLO1	CLO2	CLO3	CLO4
A4	PLO4	√	√		
A8	PLO8			√	√

3.4. Assessment Alignment Matrix

SC	PLO	PO	CLO	Teaching M.	Assessment M.
A4	PLO4	PO4	CLO1	• Lecture	• Second and Final Exams
			CLO2	• Lecture	• First , and Final
				• Discussion	• Discussion
A8	PLO8		CLO3	• Hybrid Learning	• First and Final Exams
			CLO4	• Lecture	• Second and Final Exams

Course Coordinator: Dr. Rasha Mohey Al-Deen

Head of Department: Dr. Ahmed Youssef Kamal El-Deen

Date: 5/9/2023