مقررات الفرقة الاعدادية

Preparatory Year

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering Department				
Department Offering the course	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Mathematics (1) (a)			Code	B 1011
Type	Compulsory ☒		Elective ☐		
Semester	Preparatory Year 1st Semester				
Teaching Hours	Lec.	Tut.	Lab.	Contact hours	
	4	2	0	6	

2. Professional Information:

2.1. Course description:

Modern Algebra: Sets, Elements of mathematical logic with applications, Relations, Mappings, Algebraic structures (Groups- Rings-Fields). **Differential Calculus**: The real number system, the extended real number system, real intervals. Real functions and their graphs (Algebraic functions, trigonometric functions and their inverses, exponential, hyperbolic and logarithmic functions). Limits and continuity. Differentiation of real functions of one variable. Applications of differentiation (maxima, minima and inflection points, curve tracing, optimization problems, related rates). The first mean value theorem and first order approximation of function.

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 elements of mathematical logic, relations, mappings, real functions and their graphs applications of differentiation, and its applications.
		CO2	Select a suitable item to evaluate applied engineering problems.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
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
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	Solve the suitable solution methods for various mathematics elements
		CLO4	Analyze the different problems and verifications

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Sets,	**1&2**	√	√		
The real number system, the extended real number system	**3**		√		√
Elements of mathematical logic with applications	**4&5**	√			
Relations,	**6&7**	√	√		√
Midterm Exam	**8**				
Real intervals. Real functions and their graphs	**9**	√		√	√
Mappings,	**10**	√			√
Limits and continuity	**11**		√	√	
Algebraic structures (Groups- Rings-Fields)	**13**	√	√	√	
Differentiation of real functions of one variable	**14**		√	√	
The first mean value theorem and first order approximation of function.	**15**	√			√
Total		**11**	**8**	**4**	**6**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**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				

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	**8**	**20 %**
Discussion	**3,6,9,11**	**10 %**
Quizzes	**4,7,12**	**10 %**
Final Exam	**Scheduled by the faculty council**	**60 %**
Total		**100 %**

2.8. List of References:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Tai-Ran Hsu, Applied Engineering Analysis, published by John Wiley & Sons, 2018 (ISBN 97811119071204)
	Ray E. Bolz, CRC Handbook of Tables for Applied Engineering Science, CRC Press, 2019, doi.org/10.1201/9781315214092
Periodicals, Web Sites, … etc:	https://byjus.com https://ncert.nic.in

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	√	
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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO2			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	**PO1**	**CLO1**	• Lecture • Problem-based Learning	• Midterm Exam, • Final Exam
		CLO2	• Lecture • Problem-based Learning	• Midterm Exam • Discussion • Quizzes
PLO2		**CLO 3**	• Lecture • Tutorials	• Final Exam • Quizzes
		CLO4	• Tutorials • Problem-based Learning	• Midterm Exam, • Quizzes • Discussion

Course Coordinator: Ass Prof. Mohamed Abdel Fattah Elsisy

Head of Department: Prof: Tarek M. Abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Department			
Department Offering the course	Basic Engineering Sciences Department			
Date of Specification Approval	10/9/2024			
Course Title	Mathematics 2		Code	B 1012
Type	Compulsory ☒	Elective ☐		
Semester	2nd Semester			
Teaching Hours	Lec.	Tut.	Lab.	Contact hours
	4	2	0	6

2. Professional Information:

2.1. Course description:

Linear Algebra & Geometry: Matrix algebra and systems of linear equations. Applications (codes, matrix games). Vector spaces and subspaces. Inner product spaces. Eigenvalues and eigenvectors, diagonalization of matrices. Vector algebra and linear geometry in three dimensions. Polar coordinates. Conic sections. Complex numbers. **Integral Calculus and mathematical analysis:** Indefinite integrals with applications. Methods of integration. Definite integrals with applications (areas, volumes of revolution, lengths of curves and surface integrals). Sequences and series, power series. Mean value theorems and Taylor's theorems, Taylor's and Maclaurin's expansions of functions.

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 elements of Matrix algebra, systems of linear equations, Vector spaces. Indefinite integrals with applications. Methods of integration. Definite integrals with applications.
		CO2	Select a suitable item to evaluate applied engineering problems.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
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
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	Solve the suitable solution methods for various mathematics elements
		CLO4	Analyze the different problems and verifications

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Matrix algebra and systems of linear equations	**1&2**	√	√		
Indefinite integrals with applications. Methods of integration	**3&4**		√		√
Eigenvalues and eigenvectors, diagonalization of matrices.	**5**	√			
Methods of integration	**6&7**	√	√		√
Midterm Exam	**8**				
Vector spaces and subspaces.	**9**	√		√	√
Definite integrals with applications	**10**	√			√
Vector algebra and linear geometry in three dimensions	**11**		√	√	
Sequences and series, power series	**13**	√	√	√	
Polar coordinates. Conic sections. Complex numbers.	**14**		√	√	
Taylor's and Maclaurin's expansions of functions.	**15**	√			√
Final Exam	**16**				
Total		**9**	**9**	**4**	**7**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**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				

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	**8**	**30 %**
Quizzes	**7, 12**	**5 %**
Assignment	**3,6,9,11**	**5 %**
Final Exam	**Scheduled by the faculty council**	**60 %**
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Tai-Ran Hsu, Applied Engineering Analysis, published by John Wiley & Sons, 2018 (ISBN 97811119071204)
	Ray E. Bolz, CRC Handbook of Tables for Applied Engineering Science, CRC Press, 2019, doi.org/10.1201/9781315214092
Periodicals, Web Sites, … etc:	**https://byjus.com** **https://ncert.nic.in**

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		
	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

Program Learning Outcomes	**Course Learning Outcomes**			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO2			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	**PO1**	**CLO1**	• Lecture • Problem-based Learning	• Midterm Exam, • Final Exam
		CLO2	• Lecture • Problem-based Learning	• Midterm Exam, • Quizzes
PLO2	**PO1**	**CLO 3**	• Lecture • Tutorials	• Quizzes • Assignment • Final Exam
		CLO4	• Tutorials • Problem-based Learning	• Midterm Exam, • Assignment • Final Exam,

Course Coordinator: Ass Prof. Mohamed Abdel Fattah Elsisy M.Elsi

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Department			
Department Offering the course	Basic Engineering Sciences Department			
Date of Specification Approval	10/9/2024			
Course Title	Mechanics (a)		Code	B 1021
Type	Compulsory ☒	Elective ☐		
Semester	1nd Semester			
Teaching Hours	Lec.	Tut.	Lab.	Contact hours
	4	1	1	6

2. Professional Information:

2.1. Course description:

General principles, Vector algebra and applications to mechanics, Statics of particles, Moments of forces and couples, Equivalent systems of forces and moments, Equilibrium of rigid bodies, Centroides and centers of gravity, Analysis of structures (trusses, frames and machines), Friction, Moments of Inertia (areas and masses).

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	Determine, Apply and Describe formulate the mathematics equilibrium conditions of rest for rigid bodies under the action of various loads.
		CO2	Determine, Apply and Explain The principles of statics as a science and thus apply foundations to the solution of practical problems for engineering applications.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	CLO1	Differentiate between a particle and a rigid body
		CLO2	Describe the statically equilibrium conditions of a particle and a rigid body.
		CLO3	Apply the statically equilibrium conditions of a particle and a rigid body.
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	Determine the location of the centroid for a body of a regular or irregular shape.
		CLO5	Calculate the moment of inertia for an area or mass.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
General Principles	1	√				
Analysis of Structures	2, 3, 4	√	√	√		
Static of Particle in space	5	√	√			
Rigid bodies: Equivalent force couple system	6, 7	√		√		
Mid-Term Exam	8					
Static of Rigid body in space	9	√		√		
Centroid and center of gravity	10, 11				√	
Area Moment of Inertia	12, 13					√
Mass Moment of Inertia	14					√
Total						

2.5 Teaching and Learning Methods

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

2.6 Assessment Methods

Assessment Methods:		Course LOs Covered				
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	Mid- Term Exam	√	√	√		
	Oral Exam				√	√
	Quizzes			√	√	√
Assignments				√	√	√
Summative Assessment Method						
Final Exam				√	√	√

2.7 Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	**8**	**20 %**
Oral Exam	**15**	**13.333 %**
quizzes	**3, 6, 13**	**3.333 %**
Assignments	**Weekly**	**3.334 %**
Final Exam	**Scheduled by Faculty Council**	**60 %**
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Course Notes:	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	Describe and formulate the mathematics equilibrium conditions of rest for rigid bodies under the action of various loads.	Explain The principles of statics as a science and thus apply foundations to the solution of practical problems for engineering applications.

3.2. Course Objectives VS Course Learning Outcomes

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

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes		
	CLO1	CLO2	CLO3
PLO1	√	√	√
PLO2	CLO4	CLO5	
	√	√	

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	**PO1**	**CLO1**	1. Lectures 2. Tutorials	• Written Exam • Quizzes • Assignments
		CLO2	1. Lectures 2. Tutorials	• Written Exam • Quizzes • Assignments
		CLO3	1. Lectures 2. Tutorials	• Written Exam • Quizzes • Assignments
PLO2		**CLO4**	1. Lectures 2. Tutorials	• Written Exam • Quizzes • Assignments
		CLO5	1. Lectures 2. Tutorials	• Written Exam • Quizzes • Assignments • Assignments

Course Coordinator: Dr. Diaa El-Din Khedr Diaa el Din

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Department			
Department Offering the course	Basic Engineering Sciences Department			
Date of Specification Approval	10/9/2024			
Course Title	Mechanics (b)		Code	B 1022
Type	Compulsory ☒	Elective ☐		
Semester	2nd Semester			
Teaching Hours	Lec.	Tut.	Lab.	Contact hours
	4	1	1	6

2. Professional Information:

2.1. Course description:

Kinematics of particles (rectilinear and curvilinear motion), Kinetics of particles (force and acceleration method – work and energy method – impulse and momentum method), Planar Kinetics of rigid bodies (translation – rotation about a fixed axis – general plane motion), planar kinetics of rigid bodies (force and acceleration method – work and energy method – impulse and momentum method), Mechanical

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, formulate and calculate the mathematical geometry and the equilibrium conditions of motion for a particle and rigid bodies under the action of various loads.
		CO2	Explain 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):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Describe the particle motion along different trajectory using different coordinate systems.
		CLO2	Classify the various types of rigid-body planar motion.
		CLO3	solve the rigid-body planar motion of velocity and acceleration using a dynamical reference.
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	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.
		CLO5	Use the principle of conservation of energy and the principle of conservation of linear momentum.
		CLO6	Apply the equilibrium conditions for the planar motion of the rigid body using Newton's Second Law.

2.4. 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 (components of velocity and acceleration in a curvilinear motion)	4	√					
Kinetics of particles (Newton's second law)	5, 6				√	√	
Kinetics of particles (Principle of work and energy)	7				√	√	
Mid-Term Exam	8						
Kinetics of particles (Principle of work and energy)	9				√	√	
Kinetics of particles (Principle of impulse and momentum)	10, 11				√	√	
Kinematics of Rigid bodies:(Translation and rotation motion)	12		√	√			√
Kinematics of Rigid bodies:(General Plane motion)	13		√	√			√
Kinetics of Rigid bodies (Force and acceleration)	14		√	√			√
Total		4	3	3	4	4	3

2.5 Teaching and Learning Methods

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

2.6 Assessment Methods

Assessment Methods:		Course LOs Covered					
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	Mid- Term Exam	√			√	√	
	Oral Exam		√	√	√		
	Quizzes	√	√	√			
Assignments				√		√	√
Summative Assessment Method							
Final Exam				√	√	√	√

2.7 Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	**8**	**% 20**
Oral Exam	**15**	**% 13.333**
quizzes	**3, 6, 13**	**% 3.333**
Assignments	**Weekly**	**% 3.334**
Final Exam	**Scheduled by Faculty Council**	**% 60**
Total		**% 100**

2.8. List of Reference:

Course Notes:	According to lecturer
Course Notes:	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**	**CLO4**
CO1	√	√	√
CO2	**CLO3**	**CLO5**	**CLO6**
	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	**Course Learning Outcomes**		
	CLO1	**CLO2**	**CLO3**
PLO1	√	√	√
PLO2	**CLO4**	**CLO5**	**CLO6**
	√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lectures • Tutorials	• Written Exam • Quizzes • Assignments
		CLO2	• Lectures • Tutorials	• Written Exam • Quizzes • Assignments
		CLO3.	• Lecture • Tutorials	• Written Exam • Quizzes • Assignments • Assignments
PLO2		CLO4	• Lectures • Tutorials	• Written Exam • Quizzes • Assignments
		CLO4	• Lectures • Tutorials	• Written Exam • Quizzes • Assignments • Assignments
		CLO5	• Lectures • Tutorials	• Written Exam • Quizzes • Assignments • Assignments

Course Coordinator: Dr. Diaa El-Din Khedr Diaa el Din

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering Department				
Department Offering the course	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Physics (a)			Code	B1031
Type	Compulsory ☒		Elective ☐		
Semester	Preparatory Year 1st Semester				
Teaching Hours	Lec.	Tut.	Lab.	Contact hours	
	4	0	2	6	

2. Professional Information:

2.1. Course description:

Units and dimensions, Vectors, Electric force and electric field, Motion of charge in electric field, Electric dipole in electric field. Gauss law and applications, Electric potential,

Capacitors and dielectrics, Electric energy, Current and resistance, Magnetic field and magnetic force, Sources of magnetic field, Bio-Savart law and Ampere's laws, Electromagnetic induction and Faraday's law, Self-induction and magnetic energy. Laboratory experiments on electricity, current and resistance and magnetism.

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	Apply phenomena and theories of electricity and magnetism physics related to engineering application.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, analyze, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	CLO1	Explain the concepts of charges, electric fields, electric flux, Gauss's law and its application.
		CLO2	Illustrate electric potential, capacitors, current, resistance and the magnetic field.
		CLO3	Evaluate Ampere's law and its application, the magnetic Gauss's Law, Faraday's Law and Magnetic Induction.
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	Use the results given from experiment.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
the electric field	**1,2**	√			
gauss's law	**3,4**	√			
The Electric Potential	**5,6**		√		
the capacitance	**7**		√		
Midterm	**8**				
current and resistance	**9**		√		
the magnetic field	**10,11**		√		
Sources of Magnetic Field	**12**			√	
faraday's law of induction	**13**			√	
the inductance	**14**			√	
Total		**4**	**6**	**3**	

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Kirchhoff's Voltage and Current Laws	**2**				√
Ohm's Law	**3**				√
Metric Bridge	**4**				√
Electric Field Mapping	**5**				√
Quiz 1	**6**				
Capacitor Charging	**7**				√
Capacitor Discharging	**9**				√
The Electric Transformer	**10**				√
Faraday's Law	**11**				
Quiz 2	**12**				√
Total	**8**				**8**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1. Lectures	√	√	√	
2. Practical based learning				√
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	Quizzes	√	√		√
	Midterm	√	√		
	Experimental			√	√
Summative Assessment Method					
Final Exam		√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quizzes	**4,12**	5 %
Midterm	**8**	15 %
Experimental	**15**	20 %
Final Exam	**Scheduled by the faculty council**	60 %
Total		100 %

2.8. List of Reference:

Course Notes:	**According to lecturer**
Essential Books (Textbooks):	Physics for Scientists and Engineers, R.A. Serway and J.W. Jewett, 9th Edition, 2014. Knight, R. D. (2017). *Physics for scientists and engineers: a strategic approach with modern physics* (p. 500). New York, NY: Pearson.26 july
Recommended Books:	Fundamentals of physics, Halliday & Resnick, 10th Edition,2007.

2.9. 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
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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√	√	
PLO2				√

3.4. Assessment Alignment Matrix

PO	PLO	CLO	Teaching M.	Assessment M.
PO1	**PLO1**	**CLO1**	• Lectures • Tutorials	• Quizzes • Midterm • Final Exam
		CLO2	• Lectures • Tutorials	• Quizzes • Midterm • Final Exam
		CLO3	• Lectures • Tutorials	• Experimental • Final Exam
	PLO2	**CLO4**	• Practical based learning	• Experimental

Course Coordinator: Prof: Tarek M. Abdolkader Tarek abdolkader

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering Department				
Department Offering the course	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Physics (b)			Code	B1032
Type	Compulsory ☒		Elective ☐		
Semester	2nd Semester				
Teaching Hours	Lec.	Tut.	Lab.	Contact hours	
	4	0	2	6	

2. Professional Information:

2.1. Course description:

Wave motion, Traveling waves in stretched strings, Sound waves and intensity, Doppler effect, Superposition of waves: interference, standing waves and beats, Interference of light waves, Interference from thin films, Diffraction of light, Polarization of light, temperature and heat, First law of thermodynamics, Kinetic theory of gases, specific heats of gases, thermodynamic processes: isochoric, isobaric, isothermal and adiabatic, Heat engines and efficiency, Carnot engine, Heat transfer: conduction, convection and radiation, Elastic properties of materials, Hooke's law, Hydrostatic and surface tension, Hydrodynamics, Viscosity. Laboratory experiments on waves in stretched strings, sound waves, interference, diffraction and polarization of light, specific heat, thermistor, thermal conductivity.

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	Use the basic phenomena and theories of mechanical and electromagnetic waves and thermodynamics and heat transfer physics related to engineering applications.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, analyze, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	CLO1	Explain the concept of waves, their types and mathematical description, some of their physical phenomena with a few simple applications on mechanical waves.
		CLO2	Discuss Young's interference of light, Thin Film, Single Slit Diffraction and Diffraction Grating.
		CLO3	Explain the meaning and concept of thermodynamics, its main and principle physical quantities, thermodynamic processes, first law of thermodynamics, ideal gas and its properties, heat engines and the second law of thermodynamics and heat transfer
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	Use the results given from experiments.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Wave Motion	**1,2**	√			
Sound Waves	**3,4**	√			
Superposition of Waves	**5,6**	√			
Interference of Light	**7**		√		
Midterm	**8**		√		
Diffraction of Light	**9**		√		
Heat and the First Law of Thermodynamics	**10,11**			√	
Ideal Gas and its Properties	**12**			√	
Heat Engines and The Second Law of Thermodynamics	**13**			√	
Heat Transfer	**14**			√	
Total					

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Simple Pendulum					√
Mechanical Waves					√
Malus' Law					√
Specific Heat					√
Resonance in Air column					√
Single Slit Diffraction					√
Diffraction Grating					√
Thermistor					√
Total					

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1. Lectures	√	√	√	
2. Practical based learning				√
3. Tutorials	√	√	√	

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**
Tests	Quizzes	√		√	
	Midterm	√	√		
	Practical Exam				√
Final Exam		√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quizzes	**4,12**	5 %
Midterm	**8**	15 %
Experimental	**15**	20 %
Final Exam	**Scheduled by the faculty council**	60 %
Total		100 %

2.8. List of Reference:

Course Notes:	**According to lecturer**
Essential Books (Textbooks):	Physics for Scientists and Engineers, R.A. Serway and J.W. Jewett, 9th Edition, 2014. Shankar, R. (2020). *Fundamentals of physics II: electromagnetism, optics, and quantum mechanics*. Yale University Press.26 july
Recommended Books:	Fundamentals of physics, Halliday & Resnick, 10th Edition,2007.

2.9. 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
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

Program Learning Outcomes	**Course Learning Outcomes**			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√	√	
PLO2				√

3.4. Assessment Alignment Matrix

PO	PLO	CLO	Teaching M.	Assessment M.
PO1	PLO1	CLO1	• Lectures • Tutorials	• Quizzes • Midterm • Final Exam
		CLO2	• Lectures • Tutorials	• Midterm • Final Exam
		CLO3	• Lectures • Tutorials	• Quizzes • Final Exam
	PLO2	CLO4	• Practical based learning	• Experimental

Course Coordinator: Prof. Tarek M. Abdolkader Tark abdolkader

Head of Department: Prof: Tarek M. Abdolkader Tark abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering Department				
Department Offering the course	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Chemistry (a)			Code	B1041
Type	Compulsory ☒		Elective ☐		
Semester	1st Semester				
Teaching Hours	Lec.	Tut.	Lab.	Contact hours	
	2	0	2	4	

2. Professional Information:

2.1. Course description:

An introduction to acids and bases and their behavior, kinetic theory of matter and getting familiar of gas laws. Concepts of liquid properties, energy changes during formation of solutions and factors affecting the solubility. Intermolecular forces within the substance. Types of solids and their structure and properties.

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	CO1	Knowledge of basic fundamental in engineering chemistry to provide a broad foundation in chemistry that stresses on the concepts of acids and bases and Understanding the states of matter and their behavior
		CO2	Practice the experimental analysis techniques in laboratory To improve students' virtual conceptual understanding and their skills.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Recognize the differences between acids and bases and their strength. recognize equilibrium constant and direction of reactions.
		CLO2	recognize the different chemical bonding theories within matter and their chemical properties.
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	Solve different problems about gases, liquid, solids and solutions.
		CLO4	Effectively apply the basic principles of quantitative analysis using different types of titration methods.

2.4. Course Topics:

Course Topics	Week				
		CLO1	CLO2	CLO3	CLO4
Dissociation of water &pH scale	**1**	√			√
Types of acids and bases	**2**	√			√
Acid-base behavior &chemical structure	**3**	√			√
Gas laws& molecular theory	**4**			√	
Deviation from ideal gas to real behavior	**5**			√	
Intermolecular forces& properties of liquids	**6&7**		√		
Mid term	**8**	√		√	
Phase change& phase diagrams	**9**		√	√	
Solution process& solubility	**10**		√	√	
Colligative properties	**11&12**		√	√	
Structure and bonding in solids	**13**			√	
Types of crystalline solids	**14**			√	
Practical exam	**15**				√
Final Exam	**16**	√	√	√	
Total		**5**	**5**	**9**	**4**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Safety rules and recognize glass wares	**1**				√
Volumetric determination of sodium hydroxide with a standard hydraulic acid.	**2**	√			√
Determination of carbonate content of a soda ash sample.	**3**	√			√
Determination of a Mixture of carbonate and s bicarbonate content of a soda ash sample.	**4**	√			√
Determination of chloride ion concentration.	**5**		√	√	√
Indirect determination of A mixture of halides.	**6**		√	√	√
Total	**6**	**3**	**2**	**2**	**6**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1. Lectures	√	√	√	
2. Tutorials	√	√	√	
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	Midterm Exam	√		√	
	Practical Test				√
Summative Assessment Method					
Final Exam		√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	**8**	**20 %**
Practical Test	**15**	**20 %**
Final Exam	**16**	**60 %**
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Prof. Elsayed Fouad, Engineering Chemistry I.
	Steven S. Zumdahl, Susan A. Zumdahl, Donald J. DeCoste, "Chemistry" 10th edition, 2017.
Recommended Books:	J. Brady, "General Chemistry, Principles and structures", J. Chem. Educ. 1990, 67, 7, A196, Fifth Edition.

2.9. 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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO2			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	**PO1**	**CLO1**	• Lectures • Tutorials	• Midterm Exam • Final Exam
		CLO2	• Lectures • Tutorials	• Midterm Exam • Final Exam
PLO2	**PO1**	**CLO3**	• Lectures • Tutorials	• Midterm Exam • Final Exam
		CLO4	• Practical-based Learning	• Practical test

Course Coordinator: Prof. Elsayed Ali Fouad elsayed ali fouda

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering Department				
Department Offering the course	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Chemistry (b)			Code	B1042
Type	Compulsory ☒		Elective ☐		
Semester	2nd Semester				
Teaching Hours	Lec.	Tut.	Lab.	Contact hours	
	2	0	2	4	

2. Professional Information:

2.1. Course description:

An introduction to thermochemistry and enthalpies of reaction, Chemical kinetics of reaction. Concepts of equilibrium and Le chatelier principles. Types of electrochemical cells and different type of metal corrosion. The properties of polymer and different types of polymerizations

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	CO1	Knowledge of basic fundamental in engineering chemistry to provide a broad foundation in chemistry that stresses on the concepts of reaction enthalpy, reaction rate, equilibrium constant, redox reaction and Understanding members of polymer family.
		CO2	Practice the experimental analysis techniques in laboratory To improve students' virtual conceptual understanding and their skills.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Recognize enthalpy of reaction at standard conditions. Recognize properties of polymers and members of the polymer family.
		CLO2	Recognize reaction order, rate of reaction and factors affecting on reaction rate.
		CLO3	Recognize the concept of equilibrium and Le chateliers principle.
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 redox reaction and different types of electrochemical cells. Apply cell EMF and equilibrium constant for redox reaction. Apply Different types of corrosion and basic principles to control.
		CLO5	Effectively apply the basic principles of quantitative analysis using different types of titration methods.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
thermochemistry	1	√				
Reaction rates and the dependence of rate on concentration.	2		√			
Temperature and rate &catalysis	3		√			
The concept of equilibrium &the equilibrium constant	4			√		
Heterogeneous equilibria &application of equilibrium constant.	5			√		
Le chatelier principles	6			√		
Oxidation reduction reaction, half reaction &types of electrochemical cell.	7				√	
Mid term	**8**	√	√			
Standard reduction potentials& Nernst equation electrolysis	9				√	√
electrolysis &corrosion	10				√	
Basic principles of corrosion control	11				√	
Polymerization reaction	12	√				
Members of the polymer family	13	√				
Practical exam	14				√	√
Final Exam	15	√	√	√	√	
Total		**5**	**4**	**4**	**6**	**2**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered	
		CLO4	CLO5
Titration of potassium permanganate using oxalic acid	**1**	√	√
Determination of ferrous ions in ferrous sulphate using potassium permanganate solution	**2**	√	√
Titration of ferrous sulphate using potassium dichromate solution	**3**	√	√
Standardization of sodium thiosulphate with potassium dichromate solution	**4**	√	√
Standardization of iodine solution with sodium thiosulphate solution	**5**	√	√
Determination of commercial sodium thiosulphate using iodine solution	**6**	√	√
Determination of copper ions in copper sulphate using sodium thiosulphate solution	**7**	√	√
Experimental Test	**15**		
Total	**7**	**7**	**7**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**
1. Lecture	√	√	√	√	
2. Tutorials	√	√	√	√	√
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					

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered				
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Formative Assessment Method						
Tests	Midterm Exam	√	√			
	Practical Test					√
Summative Assessment Method						
Final Exam		√	√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	**8**	**20 %**
Practical Test	**15**	**20 %**
Final Exam	**16**	**60 %**
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Prof. Elsayed Fouad, Engineering Chemistry Ii.
	Steven S. Zumdahl, Susan A. Zumdahl, Donald J. DeCoste, "Chemistry" 10th edition, 2017.
Recommended Books:	J. Brady, "General Chemistry, Principles and structures", J. Chem. Educ. 1990, 67, 7, A196, Fifth Edition.
Periodicals, Web Sites, … etc:	

2.9. 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	CLO5
CO1	√	√	√	√	
CO2					√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
PLO1	√	√	√		
PLO2				√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	**PO1**	**1**	• Lecture • Tutorials	• Midterm Exam • Final Exam
		2	• Lecture • Tutorials	• Midterm Exam • Final Exam
		3	• Lecture • Tutorials	• Midterm Exam • Final Exam
		4	• Lecture • Tutorials	• Midterm Exam • Final Exam
POL2	**PO1**	**5**	• Practical-based Learning	• Practical exam

Course Coordinator: Prof. Elsayed Ali Fouad elsayed ali fouda

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering Department				
Department Offering the course	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Engineering Drawing (A)			Code	M1061
Type	Compulsory ☒		Elective ☐		
Semester	1nd Semester				
Teaching Hours	Lec.	Tut.	Lab.	Contact hours	
	0	0	3	3	

2. Professional Information:

2.1. Course description:

This course introduces students to technical drawing a means of professional engineering communication. It will cover: sketching, line drawing, conventional lettering and dimensioning, geometric constructions, theory of view derivation, orthographic projection of engineering bodies, pictorial projection, derivation of views from isometric drawings and vice versa, derivation of views from given views, sections and derivation of sections from given views, intersection of bodies and surfaces, development of surfaces, steel construction .

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and community and promote sustainability principles.	CO1	Emphasized the importance of drawing as a language for engineers and developed student's skills in engineering drawing
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	CO2	Working in stressful environment within constraints and manage tasks and resources efficiently.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO1	Illustrate the engineering drawing (drawing tools, tangency, projections, isometrics, sections, …)
		CLO2	Define the geometry of engineering objects
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO3	Evaluate the drawing rules in engineering drawing
		CLO4	Solve problems in the sectioning of engineering objects.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to Engineering Drawing and its importance	1	√		√	√
Lettering and Lines	2	√	√		
Geometric Constructions	3-4		√		√
Isometric Projection	5-6		√		√
Dimension Isometric Projection	7		√	√	
Mid term	8				
Orthographic Projection – from Isometric	9-10				
Orthographic Projection – missing View	11-13			√	
Revision	14	√	√	√	√
Total		4	6	4	4

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1. Lectures.	√	√	√	
2. Tutorials		√	√	√
3. Discussions.	√		√	√
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			
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	Written Exam	√		√	√
Assignments		√	√		√
Summative Assessment Method					
Final Exam		√	√	√	

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	An assessment every week	**40 %**
Mid-term exam	Week # 8	**20 %**
Final written exam	Scheduled by the faculty council	**40 %**
Total		**100 %**

2.7. List of Reference:

Course Notes:	**According to lecturer**
Essential Books (Textbooks):	Reddy, K. V. 2010. Textbook of Engineering Drawing . B.S. Publ., Hyderabad. Xue, Y., Mu, H., Xue, L., & Wang, X. (2023, March). Teaching Innovation and Practice of Mind Mapping Applied to Engineering Drawing Course. In *2023 IEEE 12th International Conference on Educational and Information Technology (ICEIT)* (pp. 156-161). IEEE.
Recommended Books:	French, T. E., Vierch, C. J., Engineering Drawing and Graphic Technology, McGraw-Hill, 11th ed.
Periodicals, Web Sites, … etc:	**www.mechanical drawing google.com**

2.8. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Tutorial activities
Data Show
White Board
Office meetings.
Discussion

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO6	√		√	
PLO8		√		√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	**PO2**	**CLO1**	• Lectures • Design Studio • Discussion	• Assignments • Written final exam
		CLO3	• Lectures • Design Studio • Discussion	• Assignments • Written final exam
PLO8	**PO3**	**CLO2**	• Lectures • Design Studio • Discussion	• Assignments • Written final exam
		CLO4	• Lectures • Design Studio • Discussion	• Assignments • Written final exam

Course Coordinator: DR. Mohamed Shehata

Head of Department: Prof: Tarek M. Abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering Department				
Department Offering the course	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Engineering Drawing (B)			Code	M1062
Type	Compulsory ☒		Elective ☐		
Semester	2nd Semester				
Teaching Hours	Lec.	Tut.	Lab.	Contat hours	
	0	3	0	3	

2. Professional Information:

2.1. Course description:

This course introduces students to technical drawing a means of professional engineering communication. It will cover: sketching, line drawing, conventional lettering and dimensioning, geometric constructions, theory of view derivation, orthographic projection of engineering bodies, pictorial projection, derivation of views from isometric drawings and vice versa, derivation of views from given views, sections and derivation of sections from given views, intersection of bodies and surfaces, development of surfaces, steel construction .

2.2. Course Objectives (CO):

Program objective		Course objective	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and community and promote sustainability principles.	CO1	Emphasized the importance of drawing as a language for engineers and developed student's skills in engineering drawing
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	CO2	Working in stressful environment within constraints and manage tasks and resources efficiently.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO1	Illustrate the engineering drawing (drawing tools, tangency, projections, isometrics, sections, …)
		CLO2	Define the geometry of auxiliary views
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO3	Development of surfaces and the intersection of solids
		CLO4	Define the geometry of steel structures

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Welcome- first term final exam solution	1				
Section Views	2-5	√	√		√
Auxiliary Views	6-7	√	√	√	
Mid term	8				
Intersection of solids	9	√		√	√
Development of surfaces	10-11	√			√
Steel Structure	12-14		√	√	√
Revision	15		√	√	
Total		4	4	4	4

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1. Lectures.	√	√	√	
2. Tutorials		√	√	√
3. Discussions.	√		√	√
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			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method				
Assignments	√		√	√
Mid-term exam	√	√		√
Summative Assessment Method				
Final Exam	√	√	√	

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	An assessment every week	**40 %**
Mid-term exam	Week # 8	**20 %**
Final written exam	Scheduled by the faculty council	**40 %**
Total		**100 %**

2.7. List of Reference:

Course Notes:	**According to lecturer**
Essential Books (Textbooks):	Reddy, K. V. 2010. Textbook of Engineering Drawing . B.S. Publ., Hyderabad.
Recommended Books:	French, T. E., Vierch, C. J., Engineering Drawing and Graphic Technology, McGraw-Hill, 11th ed. Ramatsetse, B., Daniyan, I., Mpofu, K., & Makinde, O. (2023). State of the art applications of engineering graphics and design to enhance innovative product design: a systematic review. *Procedia CIRP*, *119*, 699-709.
Periodicals, Web Sites, … etc:	**www.mechanical drawing google.com**

2.8. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Tutorial activities
Data Show
White Board
Office meetings.
Discussion

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO6	√		√	
PLO8		√		√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	**PO2**	**CLO1**	• Lectures • Design Studio • Discussion	• Assignments • Written final exam
		CLO2	• Lectures • Design Studio • Discussion	• Assignments • Written final exam
PLO8	**PO3**	**CLO3**	• Lectures • Design Studio • Discussion	• Assignments • Written final exam
		CLO4	• Lectures • Design Studio • Discussion	• Assignments • Written final exam

Course Coordinator: DR. Mohamed Shehata

Head of Department: Prof: Tarek M. Abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Department			
Department Offering the course	Basic Engineering Sciences Department			
Date of Specification Approval	10/9/2024			
Course Title	Computer Fundamentals and Programming (a)		Code	E1021
Type	Compulsory ☒	Elective ☐		
Semester	1st Semester			
Teaching Hours	Lec.	Tut.	Lab.	Contact hours
	-	-	2	2

2. Professional Information:

2.1. Course description:

Historical introduction, computer classification and types, computer and society, computer components (Console outside and inside including Processors, Memory, Hard disks, Cards and Cables – Monitor, Keyboard, Mouse, Floppy drive, CD Rom, Printers, Modems, Scanners) – computer peripherals – data representation, number Systems – Software basics and types – operating systems – Introduction to DOS and DOS instructions – Windows (History, disk top, managing files and directories- important topics in windows such as control panel topics and system tools – Optional Topics as time permits: Notes about database, networks, Internet, Viruses, Security.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO.4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	CO.1	Explore fundamental and modern programming skills and general programming concepts.
		CO.2	Construct an algorithmic solution for basic problems in engineering and mathematics

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	CLO.1	Recognize the digital world, networks, and the developments in computer hardware and software from the initial steps of generation to modern and future time.
		CLO.2	Explain data representation and work with different number systems.
PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO.3	Determine the computational complexity of simple algorithms with the help of flowcharts.
		CLO.4	Develop simple algorithms with flow charts using a specific programming language.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO 1	CLO 2	CLO 3	CLO 4
Introduction to the world of computers.	1	□			
Introduce the computer system hardware.	2	□			
Present the computer software basics and operating systems.	3,4	□			
Understand the fundamentals of numbering systems and conversion between them.	5,6		□		
Introduction to computer networks (1).	7	□			
Midterm Exam	8				
Introduction to computer networks (2).	9	□			
Illustrate the important topics in windows such as control panel topics and system tools.	10	□			
Understand and determine the computational complexity of simple algorithms with the help of flowcharts and pseudo code.	11,12			□	□
Introduction to computer programming languages.	13,14			□	□
Total		6	1	2	2

2.5. Lab Topics:

Lap Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to the world of computers.	1	□			
Introduce the computer system hardware.	2	□			
Present the computer software basics and operating systems.	3,4	□	□		
Understand the fundamentals of numbering systems and conversion between them.	5,6		□		
Introduction to computer networks (1).	7	□			
Introduction to computer networks (2).	9	□			
Illustrate the important topics in windows such as control panel topics and system tools.	10	□			
Understand and determine the computational complexity of simple algorithms with the help of flowcharts and pseudo code.	11,12			□	□
Introduction to computer programming languages.	13,14			□	□
Total		6	2	2	2

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1. Computer-based instruction	□			□
2. 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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	Midterm Exam	□	□		
	Quizzes	□	□		□
Assignments		□		□	
Summative Assessment Method					
Final Exam		□	□	□	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quizzes	6th,11th	20 %
Assignments	7th,9th	20 %
Midterm exam	8th	20 %
Final exam	14th	40 %
Total		100 %

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	D. Morley, C. S. Parker, D. Beskeen, C. M. Cram, J. Duffy, L. Friedrichsen, E. E. Reding, P. J. Pratt and M. Z. Last, Introduction To Computer Literacy: Understanding Computers Today and Tomorrow, Cengage Learning, 2017. Lipponen, L. (2023, January). Exploring foundations for computer-supported collaborative learning. In *Computer support for collaborative learning* (pp. 72-81). Routledge.
Recommended Books:	H.L Capron, J.A Johnson, Computers- Tools for an Information Age, Eighth Edition, prentice Hall, 2003.
Periodicals, Web Sites, … etc:	**Computer Fundamentals and Programming related Web Sites**

2.9. Facilities required for Teaching and Learning

Different Facilities
Library Usage
laboratory Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO.1	CO.2
PO.4	□	□

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO.1	CLO.2	CLO.3	CLO.4
PLO.4	□	□		
PLO.10			□	□

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO.4	**PO.4**	**CLO.1**	• Computer-based instruction	• Midterm Exam • Quizzes • Assignments • Final Exam
		CLO.2	• Problem-based learning	• Midterm Exam • Quizzes • Final Exam
PLO.10	**PO.4**	**CLO.3**	• Problem-based learning	• Assignments • Final exam
		CLO.4	• Computer-based instruction	• Quizzes

Course Coordinator: Dr. Maha Raof and Beshoy Abdou Maha Raof

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering Department				
Department Offering the course	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Computer Fundamentals and Programming (b)			Code	E1022
Type	Compulsory ☒		Elective ☐		
Semester	2nd Semester				
Teaching Hours	Lec.	Tut.	Lab.	Contact hours	
	-	-	2	2	

2. Professional Information:

2.1. Course description:

Types of programming languages, Problem solving methods: flowcharts, algorithms, structured programming. Application on a Python Programming language for solving engineering problems with emphasis on assignments of numeric data types, Analysis of errors in numerical computations, Input and output. Selection control structures, Loops and iteration structures, Procedures and functions, Modular program design, Array processing.

2.2. Course Objectives (CO):

At the end of course, the student will be able to:

Program objective		Course objective	
PO 4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	CO 1	Characterize different programming languages and fundamental of python environment
		CO 2	Apply programming skills in core Python

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	CLO 1	Recognize the basic concepts of python programming with the help of data types, operators and expressions, etc.
		CLO 2	Add control statements for altering the sequential execution of programs in solving problems
		CLO 3	Demonstrate operations on built-in functions and container data types (list, tuple, etc.)
PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO 4	Solve complicated practical and engineering problems using learned tools of python

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to Python	1	□			
Basic coding skills, working with data types, variables, Expressions, operators, and Strings	2	□			
Learning Python logic operators and conditional statements	3, 4		□		
Define loops and iterations in python	5, 6		□		
Understand and apply string manipulation, guess-and-check, approximations, and bisection methods	7		□		
Midterm Exam	8				
Learn how to write functions in Python.	9, 10			□	
Extra examples on learned programming tools in Python	11				□
Basic skills for working with tuples, lists and their operations	12			□	
Clarify how to build Python modules and how to read and write files	13			□	
Pre-exam Revision and discussion	14				□
Total		2	3	3	2

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to Python	1	□			
Basic coding skills, working with data types, variables, Expressions, operators, and Strings	2	□			
Learning Python logic operators and conditional statements	3, 4		□		
Define loops and iterations in python	5, 6		□		
Understand and apply string manipulation, guess-and-check, approximations, and bisection methods	7		□		
Midterm Exam	8				
Learn how to write functions in Python.	9, 10			□	
Extra examples on learned programming tools in Python	11				□
Basic skills for working with tuples, lists and their operations	12			□	
Clarify how to build Python modules and how to read and write files	13			□	
Pre-exam Revision and discussion	14				□
Total					

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1. Computer-based instruction	□	□	□	
2. 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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	Midterm Exam	☐	☐		
	Quizzes	☐	☐	☐	
Assignments					☐
Summative Assessment Method					
Final Exam			☐	☐	☐

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quizzes	6th,11th	20 %
Midterm exam	8th	20 %
Assignments	10th	20 %
Final exam	15th	40 %
Total		**100 %**

2.8. List of Reference: (max. five years ago)

Course Notes:	According to lecturer
Essential Books (Textbooks):	Ashok Kamthane, Amit Kamthane, "Programming and Problem Solving with Python", McGraw Hill Education (India) Private Limited, 2018
Recommended Books:	Yashavant Kanetkar, Aditya Kanetkar, "Let us Python", BPB publication, 1st Edition, 2019
Periodicals, Web Sites, … etc:	https://www.geeksforgeeks.org/python-programming-language/

2.9. Facilities required for Teaching and Learning

Different Facilities
Library Usage
laboratory Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO 4	□	□

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
PLO 4	□	□	□	
PLO 10				□

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 4	**PO 4**	**CLO 1**	• Computer-based instruction	• Midterm Exam • Quizzes
		CLO 2	• Computer-based instruction	• Midterm Exam • Quizzes • Final Exam
		CLO 3	• Computer-based instruction	• Quizzes • Final Exam
PLO 10	**PO 4**	**CLO 4**	• Problem-based learning	• Assignments • Final Exam

Course Coordinator: Dr. Maha Raouf Maha Raouf

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering Department				
Department Offering the course	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Technology & Society			Code	M1002
Type	Compulsory ☒		Elective ☐		
Academic Year	Preparatory Year				
Semester	2nd Semester				
Teaching Hours	Lec.	Tut.	Lab.	Contact hours	
	2	-	-	2	

2. Professional Information:

2.1. Course description:

Introduction - history of technology – understanding technology and its challenges (definition, use, origin, work, change, costs and benefits, evaluation) - technology, globalization and social development sociological factors and effects (values, ethics, lifestyle, institutions and groups, international) - case study technology and engineering profession (ethics, problems, practice, future environment).

2.2. Course Objectives (CO):

Program objective		Course objective	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and community and promote sustainability principles.	**CO1**	Understand what is technology and its benefits and challenges in modern societies.
		CO2	Explore the social dimensions and development according to technology advance and globalization.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams.	**CLO1**	**Explain** technology and the advantages and disadvantages of using it.
		CLO2	**Describe** how technology affects our way of thinking and the world.
PLO10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	**CLO3**	**Justify** the social impact in design sciences.
		CLO4	**Investigate** the role of technology in achieving sustainable economy

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Nature of Technology	**1**	√			
Technological Advance	**2**	√			
The Origin of Technologies	**3**	√			
Embodying the Concept in Physical Form	**4**		√		
Progress and Social Impact in Design Sciences	**5**		√		
Models of Engineering Methodology	**6**		√		
Revolutions in Design Sciences	**7**		√		
Mid-term Exam	**8**				
The Three Factors of Quality of Life	**9**			√	
Technological Systems and Innovation	**10**			√	
Technology and Social Progress	**11**			√	
Achieving Eco-Efficiency Through Design For The Environment	**12**				√
Design Practice	**13**				√
Toward a Sustainable Economy	**14**				√
The Social Dimension of Technology	**15**				√
Total		**3**	**4**	**3**	**4**

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**
1.Course Lectures	√	√	√	
2. Report				√
3. Class Discussion			√	√
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				

2.6 Assessment Methods

Assessment Methods:		Course LOs Covered			
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Tests	Mid-term Exam	√	√		
	Oral Test/Discussion			√	√
Summative Assessment Method					
Final Exam		√	√	√	

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-term exam	Week # 8	**30 %**
Oral exam	Week # 14	**10 %**
Final written exam	Scheduled by the faculty council	**60 %**
Total		**100 %**

2.7. List of Reference: (max. five years ago)

Course Notes:	Lecture Notes
Essential Books (Textbooks):	The Nature of Technology: What It Is and How It Evolves, W. Bian Arthur, Penguin Books, 2016.
Recommended Books:	• The Evolution of Technology, George Basalla, 1st Edition, Cambridge University Press, 1989.

2.8. 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
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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO7	√	√		
PLO10			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO7	**PO2**	**CLO1**	• Course Lectures • Class Discussion	• Oral Discussion
		CLO2	• Course Lectures	• Case Study
PLO10	**PO2**	**CLO3**	• Course Lectures • Class Discussion	• Oral Discussion
		CLO4	• Course Lectures • Self-learning	• Report • Oral Discussion

Course Coordinator: Prof. Dr. Ahmed M. El-Assal
Dr. Osama Hamdy

A. Assal
Osama

Head of Department: Prof: Tarek M. Abdolkader

Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Department			
Department Offering the course	Basic Engineering Sciences Department			
Date of Specification Approval	10/9/2024			
Course Title	Production engineering and workshops (A)		Code	M1071
Type	Compulsory √		Elective ☐	
Semester	1st Semester			
Teaching Hours	Lec.	Tut.	Lab.	Contact hours
	2	-	3	5

2. Professional Information:

2.1. Course description:

This course is introductory to principles of production, function and planning of workshop, industrial safety, measurements, carpentry tools, engineering materials, metal machining, joining of materials, sheet metal work, metal forming, bench work and filling, foundry and pattern making.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	CO1	Apply different branches of production engineering , i.e Manufacturing Technology, Industrial Engineering and Quality Control
PO6	Strengthening students' ability to make decisions, solve problems, and develop architectural and urban solutions to develop and serve the local community.	CO2	Application of particular materials for specific design requirements
		CO3	E valuate basic manufacturing processes and select the appropriate process to produce various products

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	CLO1	Characterize 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	Merge the use of principles and concepts to suggest appropriate solutions for engineering problems based on analytical thinking.
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO4	Explore 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	Employ the appropriate techniques, skills, and modern engineering tools necessary for engineering practice.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO 1	CLO 2	CLO 3	CLO 4	CLO 5	CLO 6
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		√			√	
Metal forming technology	7			√		√	√
Plastic processing	8		√		√		
Joining technology	9-10			√			√
Metal removal technology , Turning, drilling, milling, shaping and planning, broaching, sawing, grinding	11	√		√			
Turning technology, machining parameters, machining time, cutting tools, tool life	12-13		√		√		
Non - conventional manufacturing processes	14			√		√	√
Total		4	4	6	5	5	4

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered					
		CLO 1	CLO 2	CLO 3	CLO 4	CLO 6	CLO 6
Carpentry workshop	**1-3**	√					
Foundry workshop	**4-6**	√					
plumbing workshop	**7-9**	√					
lathe workshop	**10-12**	√					
Total	**12**						

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
Methods	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1. Lectures and slides	√	√	√	√		√
2. Tutorials		√	√	√		√
3. problem-based learning	√	√	√	√	√	√
4. discussion	√	√		√	√	
1. projects			√	√	√	
2. Reports			√	√		
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Brain storming						
2. Presentation on case study						

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Test	Discussion	8,13	**10 %**
	mid-term exam	8	**30 %**
Report of workshop		5,11	**10 %**
Project		2,4,6,14	**10 %**
Final written examination		15	**40 %**
Total			**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Galyer, JFC and Shotbolt , CR 1990, Metrology for engineers, 5th edn, Cassell, London
Recommended Books:	Manufacturing: Design, production, Automatic and Integration. New York, NY: Gordon and Breach science publishers,2003. ISBN:9780824742737
	Katsundo Hitomi , Manufacturing Systems Engineering, A Unified Approach to Manufacturing Technology, Production Management and Industrial Economics, Routledge, 2017, doi.org/10.1201/9780203748145
Periodicals, Web Sites, … etc:	Social media: www.youtube.com Free Books Download: search.4shared.com/search.html

2.9. 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	√		
PO6		√	√

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

Program Learning Outcomes	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
PLO4	√	√	√			
PLO6				√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO4	PO4	CLO1	• Lecture	• Oral test
			• Discussion	• Experimental
		CLO2	• Practical based learning	• Observation
			• Report	• Report
		CLO3	• Problem based on learning	• Experimental
			• Project based on learning	• observation
PLO6	PO6	CLO4	• Brain storming	• Observation
			• Presentation	• observation
		CLO5	• Design studies	• Design studies
			• Presentation	• observation
		CLO6	• Reports	• Reports
			• Presentation	• observation

Course Coordinator: Prof Saleh Kaytbay Sedah Kaytbay

Head of Department: Prof: Tarek M. Abdolkader Tark abolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Department			
Department Offering the course	Basic Engineering Sciences Department			
Date of Specification Approval	10/9/2024			
Course Title	Production engineering and workshops (B)		Code	M1072
Type	Compulsory √		Elective ☐	
Semester	2nd Semester			
Teaching Hours	Lec.	Tut.	Lab.	Contact hours
	-	-	3	3

2. Professional Information:

2.1. Course description:

This course is introductory to principles of production, function and planning of workshop, industrial safety, measurements, carpentry tools, engineering materials, metal machining, joining of materials, sheet metal work, metal forming, bench work and filling, foundry and pattern making.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	CO1	Apply different branches of production engineering , i.e Manufacturing Technology, Industrial Engineering and Quality Control

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		**Course Learning Outcomes**	
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	CLO1	Characterize the knowledge about workshop's equipment and hand tools of different manufacturing processes, and the necessary safety considerations.
		CLO2	Report principles of basic machining operations including welding, filings, milling , forging

2.4. Course Topics:

Course Topics	Week	Course LO's Covered	
		CLO1	CLO2
Welding workshop	**1-3**	√	
Filings workshop	**4-6**	√	
Milling workshop	**7-8, 10**		√
Blacksmithing workshop	**11-13**		√
Total		**5**	**8**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered	
		CLO1	CLO2
Welding workshop	**1-3**	√	
Filings workshop	**4-6**	√	
Milling workshop	**7-8, 10**		√
Blacksmithing workshop	**11-13**		√
Total		**5**	**8**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered	
Methods	**CLO1**	**CLO2**
2. Tutorials	√	
3. projects		√
4. Reports		√
Teaching and Learning Methods for Students with Special Needs:		
Methods		
1. Brain storming		
2. Presentation on case study		

2.7 Assessment Methods

Assessment Methods:	Course LOs Covered	
Methods	**CLO1**	**CLO2**
Formative Assessment Method		
projects		√
Reports	√	
Summative Assessment Method		
Practical exam		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Report of workshop	5,11	**33 %**
Project	2,4,6,14	**33 %**
Practical exam	15	**34 %**
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Galyer, JFC and Shotbolt , CR 1990, Metrology for engineers, 5th edn, Cassell, London
Recommended Books:	Manufacturing: Design, production, Automatic and Integration. New York, NY: Gordon and Breach science publishers,2003. ISBN:9780824742737
	Katsundo Hitomi , Manufacturing Systems Engineering, A Unified Approach to Manufacturing Technology, Production Management and Industrial Economics, Routledge, 2017, doi.org/10.1201/9780203748145
Periodicals, Web Sites, … etc:	Social media: www.youtube.com Free Books Download: search.4shared.com/search.html

2.9. 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	√		

3.2. Course Objectives VS Course Learning Outcomes

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

3.3. Program Learning Outcomes VS Course Learning Outcomes

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

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO4	PO4	CLO1	Discussion	Experimental
		CLO2	Discussion	Experimental

Course Coordinator: Prof Saleh Kaytbay Saleh Kaytbay

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Department			
Department Offering the course	Basic Engineering Sciences Department			
Date of Specification Approval	10/9/2024			
Course Title	Technical English Language		Code	U 1011
Type	Compulsory ☒	Elective ☐		
Semester	1st Semester			
Teaching Hours	Lec.	Tut.	Lab.	Contact hours
	0	2	0	2

2. Professional Information:

2.1. Course description:

This course aims to mastering the most important terminology related to profession. Developing strategies for understanding texts in a foreign language. And to enable students to read academic paragraphs effectively; build vocabulary and take notes. The course guide students to employ basic reading skills and strategies: It will also facilitate recognizing supporting details by using punctuation marks, numbers and connecting words. In addition, the course makes use of contextual clues to infer meanings of unfamiliar words from context. Enabling students for reading and understanding the original English texts from the various sources related to the specific aspects of Electromechanical Engineering.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO5	Enable students for reading and understanding the original English texts from the various sources related to the specific aspects of Engineering	CO1	Develop basic reading comprehension skills such as scanning reading passages.
		CO2	Identify the formatting and organization of the paragraph
		CO3	Learn & understand basic grammatical rules.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO1	Recall learnt vocabulary in different situations.
		CLO2	Recall the formatting and organization of the paragraph
PLO8	Communicate effectively - graphically, verbally and in writing - with a range of audiences using contemporary tools.	CLO3	Identify grammar rules in different context.
		CLO4	Use scanning, skimming, inferring, etc. in reading text.
PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO5	identify fine details in an audio text.
		CLO6	write various writing forms

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to course Technical English language	1		√				
Teaching adjectives and adverbs	2		√	√			
Teaching nouns and pronouns	3		√	√			
Overview of verb tenses	4		√	√			
Teaching of engineering terms: Vertical & horizontal measurements	5		√	√			
Teaching of engineering terms: Dimensions of circles	6		√				
Teaching of engineering terms: Design development	7	√		√			
Mid-term Exam	8			√			
Teaching of engineering terms: Polymers	9	√		√		√	
Teaching of engineering terms: Prefixes	10		√		√		
Compounds	11	√		√		√	√
Count and non-count numbers	12				√		
Using some and any	13&14		√		√	√	
Revision	15	√		√		√	√
Total		5	8	10	3	4	3

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lectures		√	√	√	√	
2. 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						

2.6 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
1.Tests	Oral Test						
	Midterm Exam	√	√	√	√	√	√
2. Discussions							
3. Projects							
4. Assignments			√	√	√		√
5. Presentations							
6. Modeling							
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-term Exam	Week # 8	40 %
Final Exam	Scheduled by the faculty council	60 %
Total		100 %

2.7. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Lbbotson,Mark, 2009. Professional English in Use , Cambridge university press, London
Recommended Books:	Murfy, Raymond, 2013. English Grammar in Use. Cambridge university press, London
	Pawlak, M., & Csizér, K. (2023). Investigating the use of grammar learning strategies in Hungary and Poland: A comparative study. *Applied Linguistics*, *44*(2), 347-369.
Periodicals, Web Sites, … etc:	2- Concrete & The organization of paragraphs 1.ppt

2.8. Facilities required for Teaching and Learning

Different Facilities
Class
Library usage
Data show
White board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
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

Program Learning Outcomes	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
PLO5	√	√				
PLO8			√	√		
PLO10					√	√

3.4. Assessment Alignment Matrix

PLO's	PO's	CLO's	Teaching M.	Assessment M.
PLO5	**PO5**	CLO1 CLO2	1. Lectures 2. Discussion	1. Mid-term Exam 2. Final Exam
PLO8	**PO5**	CLO3 CLO4	1. Lectures 2. Discussion	1. Mid-term Exam 2. Final Exam
PLO10	**PO5**	CLO5 CLO6	1. Lectures 2. Discussion	1. Mid-term Exam 2. Final Exam

Course Coordinator: Dr. Mohammad Abdelghany Shehata

Head of Department: Prof: Tarek M. Abdolkader

Date: 10 / 9 / 2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Department			
Department Offering the course	Basic Engineering Sciences Department			
Date of Specification Approval	10/9/2024			
Course Title	Technical English Language		Code	U 1012
Type	Compulsory ☒	Elective ☐		
Semester	2nd Semester			
Teaching Hours	Lec.	Tut.	Lab.	Contact hours
	0	2	0	2

2. Professional Information:

2.1. Course description:

This course aims to provide students the most important terminology related to their specialization, master grammatical rules needed to understand texts , apply strategies for understanding scientific texts in English, and to enable learners read academic texts effectively. The course help students develop reading skills and strategies: It will also facilitate recognizing supporting details by using punctuation marks, numbers and connecting words. In addition, the course makes use of contextual clues to infer meanings of unfamiliar words from context. Enabling students for reading and understanding the original English texts from the various sources related to the specific aspects of Electromechanical Engineering.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO5	Enable students read and understand the original English texts from the various sources related to their specialization	CO1	Develop essential reading comprehension skills such as scanning reading passages.
		CO2	mastering the formatting and organization of the paragraph
		CO3	Acquire & master basic grammatical rules.

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO1	Recall learnt vocabulary in different situations.
PLO8	Communicate effectively, graphically, verbally and in writing with a range of audiences using contemporary tools.	CLO2	Identify grammar rules in different context.
		CLO3	Use scanning, skimming, inferring, etc. in reading text.
PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO4	identify fine details in an audio text.
		CLO5	Identify the formatting and organization of the paragraph
		CLO6	write various writing forms

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to the basic course principles	1	√	√				
Pronunciation of (ed) and (s) endings	2			√			
Teaching of engineering terms: Material types	3	√					
Present cont & present simple	4						
Present perfect & past simple	5						
Teaching of engineering terms: Energy	6	√	√		√		
Revision	7	√					
Mid-term Exam	8						
Pronunciation of /s/ , /z/, /j/ , /w /	9			√			
Teaching of engineering terms: Material properties	10		√		√		
Using of (for) and (since)	11	√	√				
How to write a technical report	12&13		√		√	√	√
Definitions (how to write a definition)	14	√				√	√
Revision	15	√		√		√	√
Total		8	5	3	4	3	3

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lectures	√	√	√		√	√
2. Problem-based Learning	√		√		√	
3. Presentations	√	√	√	√	√	√
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						

2.6 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
1.Tests	Oral Test						
	Midterm Exam	√	√	√	√	√	√
2. Discussions					√	√	
3. Projects							
4. Assignments		√	√	√	√	√	√
5. Presentations							
6. Modeling							
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-term Exam	Week # 8	40 %
Final Exam	Scheduled by the faculty council	60 %
Total		100 %

2.7. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Lbbotson,Mark, 2009. Professional English in Use , Cambridge university press, London Dang, T. K. A., Bonar, G., & Yao, J. (2023). Professional learning for educators teaching in English-medium-instruction in higher education: A systematic review. *Teaching in Higher Education*, *28*(4), 840-858.
Recommended Books:	Murfy, Raymond, 2013. English Grammar in Use. Cambridge university press, London
Periodicals, Web Sites, … etc:	English for specific purposes journal

2.8. Facilities required for Teaching and Learning

Different Facilities
Class
Library usage
Data show
White board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective		
	CO1	CO2	CO3
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

Program Learning Outcomes	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
PLO5	√					
PLO8		√	√			
PLO10				√	√	√

3.4. Assessment Alignment Matrix

PLO's	PO's	CLO's	Teaching M.	Assessment M.
PLO5	**PO5**	CLO1	1. Lectures 2. Discussion 3. Problem-based Learning 4. Presentations	1. Mid-term Exam 2. Final Exam 3. Assignments
PLO8	**PO5**	CLO2 CLO3	1.Lectures 2.Presentation 3.Discussion 4. Problem-based Learning	1. Mid-term Exam 2. Final Exam 3. Assignments
PLO10	**PO5**	CLO4 CLO5 CLO6	1. Lectures 2. Discussion 3.presentation 4. Problem-based Learning	1. Mid-term Exam 2. Final Exam 3. Assignments

Course Coordinator: Dr. Safwat Mohamed Reda Shoaib Safwat M. Reda

Head of Department: Prof: Tarek M. Abdolkader Tarek abdolkader

Date: 10 / 9 / 2024

مقررات الفرقة الأولى

First Year

مقررات الفرقة الأولى

First Year -1

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Basic Engineering Sciences Department			
Date of Specification Approval	10/9/2024			
Course Title	Mathematics (2) (a)		**Code**	B1111
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**Fall Semester (First Year)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	0	5

2. Professional Information:

Differential Equation (A): Classification, formation and types of solutions of ordinary differential equations. First order differential equations (separable, homogeneous, exact and linear equations). Orthogonal trajectories, n^{th} order linear differential equation with constant coefficients. Particular solution of non-homogeneous equations by operators and variation of parameters methods. Euler's equations. Reduction of order. Linear system of differential equations. Gamma and Beta function.

Multivariable Calculus (A): surface and curves in three dimension, Vector functions of one variable. Scalar functions of several variables, partial derivative. Directional derivative, total derivative. Applications (tangent planes and normal lines. Taylor expansions, maxima and minima, Lagrange's multipleiers)

2.1. Course description:

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):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**CLO1**	Solve linear and non-linear first order ordinary differential equations (ODEs).
		CLO2	Solve higher order ODEs and Linear

			systems of ODEs.
		CLO3	Evaluate surfaces and curves in three dimensions, partial derivatives of functions of several variables, tangent planes, normal lines, Taylor expansions, maxima, minima, and Lagrange's multipliers.
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.
		CLO5	Analyze the final solutions for any problem

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction to ordinary differential equations (ODEs)	**1**	√			√	
Solve linear and non-linear first order ODEs (separable, homogeneous, exact and linear equations).	**2-4**	√			√	
Solve higher order ODEs (nth order linear differential equations with constant coefficients. Solution of nonhomogeneous equations).	**5,6**		√		√	
Methods of variation of parameters	**7**		√		√	
Midterm Exam	**8**					
Euler's equations. Reduction of order. Linear systems of differential Equations.	**9**		√		√	√
Gamma and Beta functions.	**10**			√		√
Surfaces and curves in three dimensions.	**11**			√		√
Vector functions of one variable.	**12**			√		√
Directional derivatives, total derivatives.	**13**			√		√
Applications	**14**			√		√
Oral and Practical exam	**15**					
Final Exam	**16**					
Total		**4**	**4**	**5**	**8**	**6**

2.5. Lab Topics:

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
1. Lecture	√	√	√		
2. Tutorials	√	√	√		
3. Discussion				√	√
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					

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	8	20%
Discussions	2-13	8%
Assignments	2-13	12%
Final Exam	16	60%
Total		**100%**

2.8. 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/ordinary-differential-equations/

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
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

Program Learning Outcomes	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
PLO1	√	√	√		
PLO2				√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	Lecture	Midterm Exam, Final Exam Assignments
			Tutorials	
		CLO2	Lecture	Midterm Exam, Final Exam Assignments
			Tutorials	
		CLO3	Lecture	Midterm Exams, Final Exam Assignments
			Tutorials	
PLO2		CLO4	Computer-based Instruction Discussion	Assignments Discussions
		CLO5	Computer-based Instruction Discussion	Assignments Discussions

Course Coordinator: Dr. Doaa Ahmed Abd-Elwahab

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering				
Department Offering the course	Civil Engineering				
Date of Specification Approval	10/9/2024				
Course Title	Computer Applications-(1-a)		**Code**	C1101	
Type	**Compulsory** ☒		**Elective** ☐		
Semester	Fall Semester (Second Level)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	0	**0**	**2**	**2**	

2. Professional Information:

2.1. Course Description:

Introduction to AutoCAD - Drawing Elements (Line - Circle - Polygon - …etc.)

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	Use techniques, and skills, in AutoCAD, which are necessary for engineering Projects.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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
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 Topics:
L.T
2.5 Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction.	1			√	
Drawing Commands	2-5			√	
Modifying Commends	6,7				√
Midterm exam	8				
Dimensions, Text, Modify text.	9				√
Layers, Block.	10				√
Irrigation structures drawing.	11,12	√			
Reinforced concrete structures drawing	13		√		
Steel structures drawing	14		√		
Oral and Practical exam	15				
Final Exam	16				
Total		**2**	**2**	**5**	**4**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. 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	**Experimental**			√	√
Assignment		√	√		
Summative Assessment Method					
Practical				√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	The weighting of Assessment %
Experimental Tests	8	40 % (20 Degree)
Assignment	12,15	20 % (10 Degree)
Practical	15	40% (20 Degree)
Total		100% (50 Degree)

2.7. 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
Periodicals, Web Sites, … etc:	https://www.autodesk.com/learn/ondemand/tutorial/getting-started-with-autocad

2.8. 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
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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO4	√	√		
PLO12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment
PLO4	PO4	CLO1	Computer-based Instruction	Assignment
		CLO2	Computer-based Instruction	
PLO12		CLO3	Computer-based Instruction	Experimental, Practical,
		CLO4	Computer-based Instruction	

Course Coordinator: Dr. Ahmed Youssef Kamal El-Deen

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Civil Engineering Department			
Date of Specification Approval	**10/9/2024**			
Course Title	Civil Drawing (a)		**Code**	C 1103
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**1st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	1	**0**	**2**	**3**

2. Professional Information:

2.1. Course description:

Technical expressions in civil drawing - Earth works and their projection - Types of retaining walls and abutments - Projection of different kinds of bridges - Projection of irrigation structures at water way intersections.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	**Classify** the Earth works and their projection & Types of retaining walls and abutments
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	**Draw** the different kinds of bridges and irrigation structures at water way intersections.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO1**	Identify the channel sections and change in its levels and roads intersection
		CLO2	Draw different kinds of Retaining walls, Abutment and bridges.
		CLO3	Draw the irrigation structures (Syphon and Culvert)

PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO4**	Describe different kinds of irrigation structures using contemporary tools.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to irrigation structures	**1**	√			
Channel section	**2**	√			
Change in levels	**3**	√			
Roads intersections	**4**	√			
Retaining walls& Abutment	**5,6**		√		
Bridges	**7**		√		
Midterm exam	**8**				
Culvert	**9,10**			√	
Syphon	**11**			√	
Aqued.	**12**				√
Reg.	**13**				√
Weirs	**14**				√
Oral and Practical exam	**15**				
Final Exam	**16**				
Total		**4**	**3**	**3**	**3**

2.5. Lab Topics:

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√		
2. Project-based Learning		√	√	
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2		CLO4
Formative Assessment Method					
Test	Midterm Exam	√	√		
Mini Projects			√		
Assignments		√	√		√
Summative Assessment Method					
Oral Exam			√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	**1 - 7 , 9 -14**	**20 %**
Midterm exam	**8**	**26 %**
Mini Projects	**15**	**14 %**
Oral Exam	**15**	**40 %**
Total		**100 %**

2.8. List of Reference:

Course Notes:	Dr. Amr R. Elgamal Notes
Essential Books (Textbooks):	• M. G. Shah, C. M. Kale, S. Y. Patki, Building Drawing: With an Integrated Approach to Built Environment, Tata McGraw-Hill, 2002 • Ying-Kit Choi, Principles of Applied Civil Engineering Design: Producing Drawings, Specifications, and Cost Estimates for Heavy Civil Projects, American Society of Civil Engineers, 2017
Recommended Books:	• David L. Goetsch, Structural, Civil and Pipe Drafting, Cengage Learning,2013
Periodicals, Web Sites, … etc:	**Not used**

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
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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO6	√	√	√	
PLO8				√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	PO3	CLO1	● Lecture ● Discussion	● Midterm Exam ● Assignments
		CLO2	● Lecture ● Discussion ● Project-based Learning	● Midterm Exam ● Assignments ● Mini Projects ● Oral Exam
PLO8	PO4	CLO3	● Discussion ● Project-based Learning	● Assignments ● Mini Projects ● Oral Exam
		CLO4	● Discussion	● Oral Exam ● Assignments ● Mini Projects

Course Coordinator: Dr. Amr Ramadan Elgamal

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering			
Department Offering the Course	Civil Engineering			
Date of Specification Approval	10/9/2024			
Course Title	Engineering Applications (1 - a)		**Code**	C1105
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**1st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	1	-	2	3

2. Professional Information:

2.1. Course description:

The Main Elements of Structures, Construction Techniques, Building by Bricks, Soil Investigation, Types of Foundations, Retaining Works, Excavation Works, Foundation Planning, Filling Works.

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**	Calculate the quantities of all types of civil work(Inventory works , excavation, concrete works, insulation, …..etc).
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	Master different types of Building Structures, precautions of execution, Steel types, usage, bending list and formworks through a heterogeneous team

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO1**	Identify different components of building such as building systems, wall bearing and skeleton systems, foundations concept
		CLO2	Discuss the plan, supervise and monitor implementation of buildings
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical	**CLO3**	Apply the engineering techniques to understand the standard specification and quality control for materials of buildings.

	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.	**CLO4**	Calculate quantities and cost of materials for buildings primary works primary works

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Introduction of Different Projects	**1**	√			
Civil Buildings – Materials used	**2**	√			
Excavation works & Precautions	**3 - 5**	√		√	√
Types of Foundations	**6**			√	√
Retaining Works	**7**			√	√
Mid term	**8**				
Concrete buildings perfection	**9**		√	√	
Steel works and forming	**10**	√	√		
Form works	**12**	√	√		
Foundation Planning, Filling Works.	**13,14**	√	√		
Oral and Practical exam	**15**				
Final Exam	**16**				
Total		**9**	**5**	**6**	**5**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Steel forming	**10,11**			√	√
Form works	**12**			√	√
Total				**3**	**3**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture	√	√	√	√
2. Practical-based Learning			√	√
3.Self-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

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Quiz	√		√	√
	Midterm Exam	√	√		
Mini Projects			√	√	
Report					√
Summative Assessment Method					
Oral exam			√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mini Projects	14	10 %
Report	14	10 %
Quiz	7	13 %
Mid-term exam	8	27 %
Oral exam	15	40 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	- Staff lectures notes
Recommended Books:	Encyclopedia El-Bakary
Periodicals, Web Sites, … etc:	https://theconstructor.org/building/12-basic-components-building-structure/34024/

2.9. 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	√	
PO3		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO6	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	PO3	CLO1	● Lecture.	● Mid-Term Exam. ● Quiz
		CLO2	● Lecture. ● Project-based Learning.	● Mid-Term Exam. ● Mini Projects ● Oral exam
PLO11	PO1	CLO3	● Lecture. ● Practical-based Learning. ● Project-based Learning	● Quiz ● Oral exam ● Mini Projects
		CLO4	● Lecture. ● Practical-based Learning. ● Self-Learning	● Quiz ● Oral exam ● Report.

Course Coordinator:Dr. Moustafa Hamdy Mansour

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Civil Engineering Department			
Date of Specification Approval	10/9/2024			
Course Title	Structural Analysis (1 -a)		**Code**	C1111
Type	**Compulsory** ☒		**Elective** ☐	
Semester	First Semester (First Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	0	5

2. Professional Information:

2.1. Course Description:

Principals of plane statics - Loads and reactions - Stability of structures - Normal force, shear force, and bending moment for beams - Normal force, shear force and bending moment for frames - Trusses - Arches.

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	Apply a wide spectrum of engineering, and specialized skills with analytic, critical, and systemic thinking to solve structural problems.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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	Explain the determinacy and stability of structures
PLO11	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements	**CLO3**	Analyze the structure and its support conditions**.**
		CLO4	Determine the internal forces in determinate structural elements using classical methods

	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.		

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Principle of Plane Statics	1,2	√			
Loads and Reactions.	3,4	√		√	
Stability of structures	5,6		√		
Analysis of Determinate Beam.	7			√	√
Mid term	**8**				
Analysis of Determinate Beam.	9,10			√	√
Analysis of Determinate Frame.	11,12			√	√
Analysis of Determinate Truss.	13,14			√	√
Oral and Practical exam	15				
Final Exam	16				
Total		**4**	**2**	**9**	**7**

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
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				

2.6 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Test	**Mid-Term Exam**	√	√	√	√
	Quizzes			√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	The weighting of Assessment %
Mid-Term Exam	8	20 %(25 Degree)
Quizzes	9-14	20 %(25 Degree)
Final Exam	16	60%(75 Degree)
Total		100

2.7. 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

2.8. 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			
	CL1	CL2	CL3	CL4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes			
	CL1	CL2	CL3	CL4
PLO1	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment
PLO1	PO1	CLO1	Lecture	Midterm Exam, Final Exam
		CLO2	Lecture Tutorials	Midterm Exam, Final Exam
PLO11		CLO3	Lecture	Midterm Exam, Final Exam.
			Tutorials	Quizzes, Midterm Exam, Final Exam.
		CLO4	Lecture	Midterm Exam, Final Exam.
			Tutorials	Quizzes, Midterm Exam, Final Exam.

Course Coordinator: Dr. Ahmed Youssef Kamal El-Deen

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Civil Engineering Department			
Date of Specification Approval	10/9/2024			
Course Title	Properties and Testing of Materials	**Code**	C 1121	
Type	**Compulsory** ☒	**Elective** ☐		
Semester	1st Semester			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	1	1	5

2. Professional Information:

2.1. Course description:

Properties and Testing of Materials: Types of tests and Testing machine - Behavior of Engineering Materials under Static Tension Load - Behavior of Engineering Materials under Static Compression Load - Behavior of Engineering Materials under Static Bending Load - Behavior of Engineering Materials under Static Shear Forces - Behavior of Engineering Materials under Static Torsion Load - Behavior of Engineering Materials under Impact Load.

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**	**Apply** the necessary tests on different types of materials and how to test them.
		CO2	**Design** of Engineering structural items under different types of static forces.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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**	**Explain** different types of testing machines, strain gauge devices, mechanical properties and behavior of engineering materials
		CLO2	**Apply** testing methods to determine mechanical properties of engineering materials, and quality control procedures.

PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	**Select** necessary tests and engineering materials according to required specification.
		CLO4	**Analyze** Properties and Strength of Materials.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction	**1**	√			
Behavior of Engineering Materials under Static Tension Load	**2,3**	√	√		
Behavior of Engineering Materials under Static Compression Load	**4**	√	√		
Behavior of Engineering Materials under Static Bending Load	**5,6**		√	√	
Behavior of Engineering Materials under Static Shear forces.	**7**		√	√	
Mid-term exam	**8**				
Behavior of Engineering Materials under Static Shear forces (contin.)	**9,10**	√		√	√
Behavior of Engineering Materials under Static Torsion Load	**11,12**			√	√
Behavior of Engineering Materials under Impact Load	**13,14**	√	√		√
Oral and Practical exam	**15**				
Final Exam	**16**				
Total		**8**	**8**	**7**	**6**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Tension test	3	√	√		
Compression test	4		√	√	
Bending test	6	√		√	
Total		**2**	**2**	**2**	

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lectures			√	√
2. Tutorials			√	√
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				

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 to 6 and 9 to 12	4%
Mid-term exam	8	20%
Experimental Test	14	6%
Oral Test	14	10%
Final exam	16	60 %
Total		**100%**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	1. المواصفات القياسية المصرية. 2. المواد الهندسية مقاومتها واختبارها (الجزء الأول والجزء الثاني)، ا.د. احمد العريان - ا.د. عبد الكريم عطا 3. مقاومة واختبار المواد، د. عبد الوهاب محمد عوض - د. إبراهيم على درويش
Recommended Books:	1. Mechanics of Materials, James M. Kere & Barry J. Goodno, CENGAGE Learning, ISBN-13: 978-1111577735 / ISBN-10: 1111577730. 2. Strength of Materials, S. S. Bhavikatti,Vikas, Vicas, ISBN-13: 978-9325971578, ISBN-10: 9325971577.
Periodicals, Web Sites, … etc:	https://byjusexamprep.com/mechanical-properties-of-engineering-materials-i https://mffeci.ekb.eg/linkresolver/openurl/v0.1 Egyptian Knowledge Bank

2.9. 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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO2	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Practical-based Learnings	• Oral Test • Experimental Test
		CLO2	• Practical-based Learnings	• Oral Test • Experimental Test
PLO11		CLO3	• Lectures • Tutorials • Practical-based Learnings	• Midterm Exam • Final Exam • Assignments • Oral Test • Experimental Test
		CLO4	• Lectures • Tutorials	• Final Exam • Assignments

Course Coordinator: Dr. Marwa Hany Bondok. مروة هاني

Head of Department: Prof. Dr. Hala Refat Date:

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Department			
Department Offering the course	Civil Engineering Department			
Date of Specification Approval	10/9/2024			
Course Title	Fluid Mechanics		**Code**	C 1141
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**1st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	1	1	5

2. Professional Information:

2.1. Course description:

Dimension and units - Properties of liquids – Fluid statics - Type of flow - Flow over weirs – Flow through orifices - Continuity equation - Bernoulli's equation - Momentum equation - Losses.

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**	Apply the fundamental principles of fluid mechanics for the solution of practical civil Engineering problems.
		CO2	Solve practical Civil Engineering problems of water conveyance in pipes and pipe networks

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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 experiments on hydraulic laboratory devices
		CLO2	Assess the results from physical equations and compare it with the experimental tests.

PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	Apply different techniques of fluid mechanics, for solving civil engineering problems.
		CLO4	Analyze fluid flow problems using Mass, Energy and Momentum equations

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Introduction & Dimensions and Units	1			√	
Properties of liquids	2			√	
Fluid statics and pressure measurements	3			√	
Forces on Submerged Surface	4			√	
Buoyancy and Floatation	5			√	
Fluids in Relative Equilibrium	6			√	
Types of flow	7			√	
Midterm exam	8				
Continuity equation	9			√	√
Bernoulli's equation	10			√	√
Flow over weirs & Flow through orifices	11			√	√
Momentum equation	12			√	√
Flow in pipes and losses	13			√	
Available software packages to solve flow problems	14			√	
Oral and Practical exam	15				
Final Exam	16				
Total				13	4

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Determine Densities, and Specific Gravities.	2	√	√		
Determine Weights and Viscosity.	3	√	√		
Bernoulli's Theorem Demonstration.	10	√	√		
Flow through sharp edged Orifice.	11	√	√		
Flow over Rectangular and Triangular Weir	12	√	√		
Analysis of flow in pipes and pipe networks	14	√	√		
Total	**6**	**6**	**6**	**-**	**-**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lectures			√	√
2. Tutorials			√	√
3. Practical-based Learning	√	√		
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2		CLO4
Formative Assessment Method					
Tests	Oral Test	√	√		
	Midterm Exam				
	Experimental	√	√		
	Quizzes				√
Reports					√
Summative Assessment Method					
Final Exam				√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quizzes	2-12	2%
Experimental	14	5%
Midterm Exam	8	20%
Reports	14	3%
Oral Test	15	10%
Final Exam	16 and above	60%
Total		100%

2.8. List of Reference:

Course Notes:	
Essential Books (Textbooks):	A Brief Introduction to Fluid Mechanics, sixth Edition by Donald F. Young, Bruce R. Munson, Theodore H. Okiishi, Wade W. Huebsch, Wiley 2010, ISBN: 0470596791, 9780470596791
Recommended Books:	• Frank M. White, Fluid Mechanics, 8th Edition, McGraw Hill, 2013. ISBN13: 9780073398273 Copyright: 2016 • Fundamentals of Fluid Mechanics, Bruce R. Munson, Donald F. Young, Theodore H. Okiishi, and Wade W. Huebsch, Wiley co., SI Version, 6th Edition, 2010., ISBN: 978-0-470-39881-4 • Solving Problems in Fluid Mechanics, volume 1& 2, J.F.Douglas, Longman scientific and technical, Longman group UK Ltd, Longman house, Burnt Mill, Harlow, Essex CM20 2JE, England.
Periodicals, Web Sites, … etc:	-

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board
laboratory Usage

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO2	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Practical-based Learning	• Oral Test • Experimental Test
		CLO2	• Practical-based Learning	• Oral Test • Experimental Test
PLO11		CLO3	• Lecture • Tutorials • Report	• Quizzes • Mid-Term Exam • Final Exam • Reports
		CLO4	• Lecture • Tutorials • Report	• Final Exam • Quizzes • Report

Course Coordinator: Dr. Fahmy Salah Abdelhaleem

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Electrical Engineering Department				
Date of Specification Approval	**10/9/2024**				
Course Title	Electrical Engineering Technology			**Code**	E1105
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**First Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	1	0	4	

2. Professional Information:

2.1. Course description:

The course topics are: -

Elements of electrical circuits - Linear circuits- circuit concepts. DC circuits and network theorems. Capacitance- inductance - Sinusoidal alternating current circuits at steady state - Balanced 3-phase circuits and power calculations. Electronics: diode circuits - transistors Op-amplifiers circuits - integrated circuits. Basics of Electrical distribution: Transmission lines – underground cables - electrical installations in buildings.

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**	Analyze simple (DC and AC) electric circuits and simple (diode, transistor, and Op-amplifier) electronic circuits.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Design a part of electrical installations in buildings.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	**CLO1**	Define the DC and AC variables and components.
		CLO2	Use network theorems to analyze DC circuits and AC single and 3-phase circuits.
		CLO3	Analyze simple diode, transistor, and Op-amplifier electronic circuits.
		CLO4	Compare between transmission lines and underground cables.
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**	Design the electrical illumination system in buildings.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Elements of electrical circuits - Linear circuits- circuit concepts.	**1**	√				
DC circuits and network theorems.	**2-4**		√			
Single phase and 3-phase AC circuits	**5-7**	√	√			
Mid term	**8**					
Electronics: Diode circuits – Transistors - Op-amplifiers circuits - Integrated circuits	**9,10**			√		
Basics of Electrical distribution: Transmission lines - Underground cables	**11,12**				√	
Electrical installations in buildings	**13,14**					√
Oral and Practical exam	**15**					
Final Exam	**16**					
Total		**4**	**6**	**2**	**2**	**2**

2.5. Lab Topics:

N.A

2.6 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					

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method						
Tests	Midterm Exam	√	√			
	Quiz	√		√		√
Assignment				√	√	√
Summative Assessment Method						
Final Exam			√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quiz	4,6,12	10%
Midterm	8	20%
Assignment	10-12	10%
Final Exam	16	60%
Total		**100%**

2.8. List of Reference:

Course Notes:	
Essential Books (Textbooks):	JAMES W. NILSSON, "Electric circuits"
Recommended Books:	Therja, "Basic Electrical Engineering" Fundamentals of Electrical Engineering I, Don H. Johnson ,2016, : http://cnx.org/content/col10040/
Periodicals, Web Sites, … etc:	https://www.mtu.edu/applied-computing/what-is-eet/

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	√	
PO6		√

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
PLO1	√	√	√	√	
PLO3					√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture	• Midterm Exam • Quiz
		CLO2	• Lecture • Tutorials	• Midterm Exam • Final Exam
		CLO3	• Lecture • Tutorials • Discussion	• Quiz • Assignment • Final Exam
		CLO4	• Lecture • Discussion	• Final Exam • Assignment
PLO3	PO6	CLO5	• Lecture • Tutorials • Discussion	• Quiz • Assignment • Final Exam

Course Coordinator: Dr. Khamis Allam Khamis

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**			
Department Offering the Program	**Civil Engineering Department**			
Department Offering the Course	**Basic Sciences Department**			
Date of Specification Approval	**10/9/2024**			
Course Title	English language		**Code**	U1111
Type	**Compulsory** ☒	**Elective** ☐		
Semester	1st Semester			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	-	2	-	2

2. Professional Information:

2.1. Course description:

English for Science is an ESP (English for Specific Purposes) course directed to students of civil engineering. It runs in the first semester of every year. The course is offered in14 weeks with a 2-hour-per-week teaching plan.

The main aim of this ESP (English for Specific Purposes) course is to equip students with the language essential for their scientific divisions by providing them with subject-specific language and terminology. Overall, it develops the language and skills that the students need to succeed in their programs. It integrates all language skills, reading, writing, listening, and speaking as well as scientific terminology

2.2. Course Objectives (CO):

The students will be able to:

Program objective		**Course objective**	
PO5	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	Identify academic terminologies related to their field of specialization.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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.
		CLO2	Practice research techniques using abstract ideas and arguments from a range of texts.
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of	**CLO3**	Identify appropriate written and oral communication in different situations in English.

	audiences using contemporary tools.	**CLO4**	Communicate efficiently to convey ideas verbally.
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 Topics:

Course Topics	**Week**	**Course LO's Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Introduction to course content	1		√	√	√		
Will &be going to	2						√
Working ,forming and heat treating metal	3					√	
Prefixes	4		√			√	
Minerals and ceramics	5						
Subject –verb agreement (1)	6						√
Subject –verb agreement (2)	7						√
Midterm Exam	8						
Design solutions	9	√			√	√	
Adjectives	10						√
Dimensions of circles	11	√		√			
Compounds	12	√		√			
Interconnection	13					√	√
Non-ferrous metals	14					√	√
Oral and Practical exam	15						
Final Exam	16						
Total		3	2	3	2	5	6

2.5 Teaching and Learning Methods:

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1. Tutorials			√	√		
2. Discussion			√	√		
3. Self- learning					√	√
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						

2.6 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
1.Tests	Oral Test	√	√			√	√
	Midterm Exam			√	√		
2. Discussions				√	√		
3.Reports		√	√			√	√
Summative Assessment Method							
Final Exam				√	√		

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-term Exam	8	30%
Oral Test	15	4%
Discussions	9-12	3%
Reports	15	3%
Final Exam	Scheduled by the faculty council	60%
Total		100%

2.7. List of Reference:

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

2.8. 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

Program Learning Outcomes	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
PLO5	√	√				
PLO8			√	√		
PLO10					√	√

3.4. Assessment Alignment Matrix

PLO's	PO's	CLO's	Teaching M.	Assessment M.
PLO5	PO5	CLO1 CLO2	Report	Oral Test Reports
PLO8		CLO3 CLO4	Tutorials Discussion	Midterm Exam Final Exam Discussions
PLO10		CLO5 CLO6	Reports Self- learning	Oral Test Reports

Course Coordinator: Dr. Yasmin Mohamed Essaid Yasmin

Head of Department: Prof. Dr. Hala Refat Date

10 / 9 /2024

مقررات الفرقة الأولى

First Year - 2

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**				
Department Offering the Program	**Civil Engineering Department**				
Department Offering the Course	**Basic Engineering Sciences Department**				
Date of Specification Approval	**10/9/2024**				
Course Title	**Mathematics (2 - b)**			**Code**	B 1112
Type	**Compulsory** ☒		**Elective** ☐		
Semester	Second Semester **(Third level)**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**0**	**5**	

2. Professional Information:

2.1. Course description:

Differential Equations (B): Series solution of differential equations. Special functions of mathematical physics (Legendre polynomials and Bessel functions). Laplace transforms with applications, Fourier series with applications. Partial Differential Equations (Classification and types of solutions, solution of linear partial differential equations with constant coefficients, canonical and standard forms, solution of some initial-boundary value problems).
Multivariable Calculus (B): Double integrals with applications. Triple integrals with applications, cylindrical and spherical polar coordinates. Line and surface integrals with applications. Vector analysis.

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 Series solution of differential equations. Special functions of mathematical physics.
		CO2	Evaluate applied engineering problems by selected a suitable item.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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
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 Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Series solution of differential equations. Special functions of mathematical physics (Legendre polynomials and Bessel functions).	1&2	√	√		
Laplace transforms with applications,	3		√		√
Partial Differential Equations (Classification and types of solutions, solution of linear partial differential equations with constant coefficients, canonical and standard forms, solution of some initial-boundary value problems) .	4&5	√			
Double integrals with applications	6&7	√	√		√
Midterm Exam	8				
Fourier series with applications.	9&10	√			√
Triple integrals with applications	11	√	√	√	
Cylindrical and spherical polar coordinates	12,13		√	√	
Line and surface integrals with applications. Vector analysis.	14	√			√
Practical and Oral Exam	15				
Final Exam	16				
Total		10	8	3	6

2.6 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				

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	**8**	**30%**
Discussion	**3,6,9,11**	**10%**
Final Exam	**16**	**60%**
Total		**100%**

2.8. List of Reference:

Course Notes:	Lecture notes
Essential Books (Textbooks):	1. 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**

2.9. 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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO2			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture • Tutorials	• Midterm Exam, Final Exam
			• Problem-based Learning	• Discussion
		CLO2	• Lecture • Tutorials	• Midterm Exam, Final Exam
			• Problem-based Learning	• Discussion
PLO2		CLO 3	• Lecture • Tutorials	• Midterm Exam, Final Exam
			• Problem-based Learning	• Discussion
		CLO4	• Lecture • Tutorials	• Midterm Exam, Final Exam
			• Problem-based Learning	• Discussion

Course Coordinator: Dr/Wageda ibrahim

Head of Department: Prof. Dr. Hala Refat Date:

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**			
Department Offering the Program	**Civil Engineering Department**			
Department Offering the Course	**Civil Engineering Department**			
Date of Specification Approval	**10/9/2024**			
Course Title	Structural Analysis (1 -b)		**Code**	C1112
Type	**Compulsory** ☒		**Elective** ☐	
Semester	Second Semester (First Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course Description:

Influence lines for beams, Frames and Trusses - Properties of cross sections - Normal stresses - Shear stresses - Torsional Stresses - Combined stresses.

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** principles of engineering to detect issues related to the structure.
		CO2	**Classify** a wide-ranging of engineering principles, techniques, and specialized skills, coupled with a rigorous and thorough approach to analysis, critical thinking, and holistic problem-solving, to accurately diagnose and by calculating the stresses on the structural sections.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identity, formulate and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	**CLO1**	**Identify** the Influence lines structures and different types of structural elements.
		CLO2	Determine normal stresses in complex cross sections.
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	**CLO3**	**Calculate** shear stresses in various types of structural members under different loading conditions .
		CLO4	**Calculate** the combined stresses in various types of structural members .

	of civil engineering concepts and techniques of Structural Analysis and Mechanics, Properties, and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.		

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Influence lines for beams, Frames and Trusses	1,2,3	√			
Properties of cross sections	4,5		√		
Normal stresses	6,7		√		
Mid-Term Exam	**8**				
Shear stresses	9,10			√	
Torsional Stresses	11,12			√	
Combined stresses.	13,14				√
Oral and Practical exam	**15**				
Final Exam	16				
Total		**5**	**3**	**10**	**8**

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
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				

2.6 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Test	**Mid-Term Exam**	√	√		
	Quizzes		√	√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Tests	**Mid-Term Exam**	8	20 %(25 Degree)
	Quizzes	9-14	20 %(25 Degree)
Final Exam		16	60%(75 Degree)
Total			100

2.7. 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 Learning 2012. ISBN-13: 978-0-495-66775-9

2.8. 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
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	Lecture	Quizzes, Midterm Exam, Final Exam
		CLO2	Lecture Tutorials	Quizzes, Midterm Exam, Final Exam
PLO11		CLO3	Lecture	Final Exam.
			Tutorials	Quizzes, Final Exam.
		CLO4	Lecture	Final Exam.
			Tutorials	Quizzes, Final Exam.

Course Coordinator: Dr. Ahmed Youssef Kamal El-Deen

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Civil Engineering Department			
Date of Specification Approval	10/9/2024			
Course Title	Technology of Building Materials		**Code**	1122
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**Second Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	1	1	5

2. Professional Information:

2.1. Course description:

Specifications and standard specifications of materials and products - Main properties of engineering materials - Building Rocks - Mineral binding materials {Lime, Gypsum & Cement} - Concrete aggregates - Steel reinforcement - Bricks - Fiber - Composite materials.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	**Evaluate** and judge the construction materials.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	**Design** of construction materials.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and	**CLO1**	Conduct appropriate experiments on building materials.

	evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**CLO2**	Judge on the experimental results.
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	Choose suitable materials and techniques for civil engineering applications.
		CLO4	Determine the properties of construction materials.
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.	**CLO5**	Manage appropriate construction techniques.
		CLO6	Assess the quality of construction materials.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Fundamental properties of constructions materials	**1**			√	√		
Building rocks	**2, 3**			√	√		
Mineral binder materials	**4**			√	√		
Air Lime	**5**			√	√		
Gypsum	**6**			√	√		
Cement	**7**	√	√	√	√		√
Mid-term Exam	**8**						
Concrete aggregates	**9,10**	√	√	√	√	√	√
Reinforcement steel	**11**			√	√	√	√
Bricks	**12**			√	√	√	√
Fiber reinforced polymers	**13,14**			√	√	√	√
Practical and Oral Exam	**15**						
Final Exam	**16**						
Total		**3**	**3**	**13**	**13**	**6**	**7**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Cement tests (I)	7	√	√		√		√
Cement tests (II)	9	√	√		√		√
Concrete aggregates tests	10	√	√		√		√
Total	**3**	**3**	**3**		**3**		**3**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1.Lecture			√	√	√	√
2.Tutorial			√	√	√	√
3.Practical-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						

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	Oral Test	√	√				
	Midterm Exam	√	√	√	√		
	Experimental Test	√	√		√		
Assignments		√	√	√	√	√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Assignments	2 to 8 & 10 to 14	5%
Midterm Exam	8	20%
Experimental	15	5%
Oral Exam	15	10%
Final Exam	16	60%
Total		**100%**

2.8. List of Reference:

Course Notes:	Used
Essential Books (Textbooks):	1- الكود المصري لتصميم وتنفيذ المنشآت الخرسانية - 203. 2- الكووود المصووري سسووم تصوووميم واتووترااذات تنفيووذ اللووووليمرات الم~وو ة باسلياف في مجالات التشييد – 208. 3- الم ق الثالو ل كوود المصوري لتصووميم وتنفيوذ المنشوآت الخرسوانية (دليوt الاختلارات المعم ية لمواد الخرسانة).
Recommended Books:	1- Construction Materials Their Nature and Behaviour, Fifth Edition, Edited By Marios Soutsos, Peter Domone, ISBN 9781498741101. 2- Building Materials (THIRD REVISED EDITION), S. K. Duggal, NEW AGE INTERNATIONAL (P) LIMITED PUBLISHERS, ISBN-13: 978-81-224-2975-6. 4- "خواص واختلار المواد" (الجزء اسول والثاني) أ.د. علد الكريم عطا أ.د. أحمد العريان.
Periodicals, Web Sites, … etc:	https://www.buildingmaterials.co.uk/ https://www.sciencedirect.com/journal/construction-and-building-materials

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 Objective	
	CO1	CO2
PO1	√	
PO6		√

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
PLO2	√	√				
PLO11			√	√		
PLO13					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Practical-based Learning • Discussion	• Oral test • Experimental Test • Written exam • Assignments
		CLO2	• Practical-based Learning • Discussion	• Oral test • Experimental Test • Written exam • Assignments
PLO11		CLO3	• Lecture • Tutorial	• Written exam • Assignments
		CLO4	• Lecture • Tutorial • Practical-based Learning	• Written exam • Assignments • Oral Test • Experimental Test
PLO13	PO6	CLO5	• Lecture • Tutorial	• Written exam • Assignments
		CLO6	• Lecture • Tutorial	• Written exam • Assignments

Course Coordinator: Prof. Dr\ Khaled Mohamed El-Sayed

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**			
Department Offering the program	**Civil Engineering Department**			
Department Offering the course	**Civil Engineering Department**			
Date of Specification Approval	**10/9/2024**			
Course Title	Plane Surveying		**Code**	C1132
Type	**Compulsory** ☒		**Elective** ☐	
Semester	second Semester (first Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**1**	**1**	**5**

2. Professional Information:

2.1. Course description:

Introduction to surveying and mapping - History - Definitions - Classifications - Units - Scales - Coordinates - Reconnaissance - Sketch drawing - Distance measurement - Electronic distance measurement - Angle and direction measurement - Theodolites - Vertical angle measurements - Horizontal angle measurements - Traverse - Traverse adjustment - Area measurements.

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** practical and theoretical skills in the surveying and setting out of buildings and solve surveying problems in real-life situations.
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO2**	**Apply** the student's sense and capabilities in performing plane surveying measurement techniques and instruments to establish horizontal and vertical control with the necessary adjustment.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water	**CLO1**	**Identify** the basic principles of plane survey.
		CLO2	**Calculate** Tacheometry measurements,

	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**	**Solve** the Traverse computations and adjustment
		CLO4	**Apply** Scale and area computation
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**	**Use** theodolite instrument for angle measurements.
		CLO6	**Apply** the basic principles of the EDM instrument.
PLO5	Practice research techniques and methods of investigation as an inherent part of learning	**CLO7**	**Practice** research about Surveying Maps

2.4. Course Topics:

Course Topics	Week	Course LO's Covered						
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
Review of plane survey -History - Definitions - Classifications – Units	1	√						
Scale and area computation	2,3		√				√	
Main Directions -A bearing of a line in surveying	4,5	√						√
Theodolites -Vertical angle measurements - Horizontal angle measurements	6,7		√			√		
Midterm exam	**8**							
Tacheometry measurements - Classification of Tacheometry	9	√						
Electromagnetic Distance Measurement	10.11	√					√	
Traverse definitions- Types of Traverses- Traverse computations and adjustment	12,13			√				
Surveying Maps	14				√			√
Practical and Oral Exam	**15**							
Final Exam	16							
Total		**6**	**4**	**2**	**1**	**2**	**4**	**3**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered						
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
Theodolite instrument	5,6,7					√	√	
Practical Exam	**15**	√	√			√		
Total	**3**	**1**	**1**			**2**	**1**	

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered						
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
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							

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered						
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
Formative Assessment Method								
Tests	Midterm Exam	√	√					
	Experimental Test					√	√	
	Oral Test							√
Discussion		√	√	√	√			
Report								√
Summative Assessment Method								
Final Exam		√	√	√	√			

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Tests	**Mid-Term**	8	16%(20degree)
Discussion		2,4,6,7,10,12	4%(5degree)
Report		14	4%(5degree)
Practical Exam		15	12%(15degree)
Oral Exam		15	4%(5degree)
Final Exam		16	60%(75degree)
Total			100

2.8. List of Reference:

Essential Books (Textbooks):	• Breaks, T. (2011), " A complete system of land-surveying: both in theory and practice", Printed by T. Saint for W. Charnley and J. Murray in London, 1771.
Recommended Books:	• El Maghraby, S. (2012), "E-Learing Courses in Engineering Surveying", Azhar. • University, Cairo.EL-Fiky G. S. (2014), "Plane Surveying". Faculty of Engineering, Zagazig University, pp 310.

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	√	
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

Program Learning Outcomes	Course Learning Outcomes						
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
PLO2					√	√	
PLO5							√
PLO11	√	√	√	√			

3.4. Assessment Alignment Matrix

PLO	PO	CLOs	Teaching M.	Assessment
PLO2	PO1	CLO5	Practical-based Learning	Practical Exam
		CLO6	Practical-based Learning	Practical Exam
PLO5	PO5	CLO7	Reports	Oral Exam
				Report
PLO11	PO1	CLO1	Lecture	Midterm Exam, Final Exam
			Tutorials	
		CLO2	Lecture	Midterm Exam, Final Exam
			Tutorials	
		CLO3	Lecture	Final Exam
			Tutorials	
		CLO4	Lecture	Final Exam
			Tutorials	

Course Coordinator: Dr. Ahmed Saber

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**			
Department Offering the Program	**Mechanical Engineering Department**			
Department Offering the Course	**Mechanical Engineering Department**			
Date of Specification Approval	**10/9/2024**			
Course Title	**Mechanical Engineering Technology**		**Code**	**M1104**
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**Spring Semester (First Year)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**1**	**0**	**4**

2. Professional Information:

2.1. Course Description:

Applications of mechanical engineering in civil engineering. Thermodynamics: Definitions and basic concepts – Properties of pure substances (pure substance, phase change process, properties diagram and tables, ideal gas)- First law of thermodynamics (closed system, open systems, applications) – Second law of thermodynamics (Heat engines, heat pump air conditioning and refrigerators). Heat Transfer: Introduction to Heat Transfer – Modes of heat transfer (conduction, convection, and radiation) – one dimensional steady heat conduction- Extended surfaces- Introduction to convection heat transfer (Free and forced) – Applications on civil work equipment.

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 first and second law of thermodynamics.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	**Use** the basic fundamental of heat transfer modes with appropriate attention to health and safety risks

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO1	Identify, formulate, and solve complex engineering problems by	**CLO1**	**Identify** the basic principles of thermodynamics.

	applying engineering fundamentals, basic science, and mathematics.	**CLO2**	**Apply** the first law of thermodynamics to closed and open systems.
		CLO3	**Apply** the first law of thermodynamics to engineering systems.
		CLO4	**Apply** the second law of thermodynamics
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**	**Evaluate** the thermal efficiency of heat engines and COP of the refrigerator cycle.
		CLO6	**Identify** the different modes of heat transfer and composite walls.
		CLO7	**Characterize** to convection heat transfer (Free and forced).
		CLO8	**Describe** Extended surfaces

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Introduction to thermodynamics	1,2	√							
Calculate work and heat	3	√	√						
First law of thermodynamics for closed systems	4,5	√	√	√	√	√			
First law of thermodynamics for open systems	6,7	√	√	√					
Midterm-Exam	**8**								
Second law of thermodynamics	9,10		√	√	√	√			
Introduction to heat transfer	11						√		
one dimensional steady heat conduction	12						√		√
Convection heat transfer (free and forced)	13						√	√	√
Extended surfaces	14						√	√	√
Practical and Oral Exam	**15**								
Final Exam	16								
Total		**8**	**8**	**7**	**4**	**4**	**4**	**2**	**3**

2.5 Lab Topics

N.A

2.6 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. 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								

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Formative Assessment Method									
Test	Midterm Exam	√	√	√					
	Quize	√	√	√	√				
Assignments		√	√	√	√	√	√	√	√
Report			√	√	√	√	√	√	
Summative Assessment Method									
Final Exam		√	√			√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Tests	Quiz	4, 12	10%
	Midterm-exam	8	20%
Report		7,13	5%
Assignments		3,6,10,13	5%
Final Exam		16	60%
Total			**100%**

2.8. List of Reference:

Essential Books (Textbooks):	Fundamentals of Thermal-Fluid Sciences, by Yunus Cengel and Robert Turnerm McGraw-Hill Education; 4th edition.
Recommended Books:	Thermodynamics: An Engineering Approach 8th Edition by Yunus Cengel (Author), Michael Boles.

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	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
PLO1	√	√	√	√				
PLO3					√	√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• 1. Lecture • 2. Tutorials	• Midterm exam and final exam • Assignment
		CLO2	• 1. Lecture • 2. Tutorials • Discussion	• Midterm exam and final exam • Assignment • Report
		CLO3	• 1. Lecture • 2. Tutorials • 3. Discussion	• Midterm exam and final exam • Assignment • Report
		CLO4	• 1. Lecture • 2. Tutorials • 3. Discussion	• Midterm exam and final exam • Assignment • Report
PLO3	PO6	CLO5	• 1. Lecture • 2. Tutorials • 3. Discussion	• Midterm exam and final exam • Assignment • Report
		CLO6	• 1. Lecture • 2. Tutorials • 3. Discussion	• Midterm exam and final exam • Assignment • Report
		CLO7	• 1. Lecture • 2. Tutorials • 3. Discussion	• Midterm exam and final exam • Assignment • Report
		CLO8	• 1. Lecture • 2. Tutorials	• Midterm exam and final exam • Assignment

Course Coordinator: Dr. Abdelgalil Mohamed

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**				
Department Offering the Program	**Civil Engineering Department**				
Department Offering the Course	**Civil Engineering Department**				
Date of Specification Approval	**10/9/2024**				
Course Title	Computer Applications-(1-b)			**Code**	**C1102**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**Spring Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	0	**0**	**2**	**2**	

2. Professional Information:

2.1. Course description:

Application of AutoCAD in drawing different types of civil structures (Irrigation structures - Reinforced concrete structures - Steel structures) - Selected Computer Language.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	Apply techniques, and skills, using selected computer language in different types of application of civil structures

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles	**CLO1**	**Draw** Irrigation, reinforced concrete and steel structures projects using AutoCAD
		CLO2	**Choose** suitable function of excel program for civil applications
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**	**Identify** main function of excel
		CLO4	**Use** excel program in civil applications

2.4 Course Topics:
L.T

2.5. Lab Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Review on AutoCAD	1,2	√			
Introduction to Microsoft Excel	3,4			√	
Date and Time Functions	5,6		√		
Formatting Values	7		√		
Mid-Term	8				
If function	9		√		
Convert	10		√		
VLOOKUP	11		√		
Approximation Functions.	12		√		
Application	13-14				√
Practical and Oral Exam	15				
Final Exam	16				
Total		2	7	2	2

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Computer-based Instruction	√	√	√	
2. 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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Test	Experimental	√	√	√	
Mini Projects					√
Summative Assessment Method					
Practical		√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Experimental Test	**8**	40 % (20Degree)
Mini Projects	**14**	20 % (10Degree)
Practical Exam	**15**	40% (20 Degree)
Total		100% (50Degree)

2.8. List of Reference:

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
Lecture Hall
Laboratory 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

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

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment
PLO4	PO4	CLO1	Computer-based Instruction	Experimental, Practical
		CLO2	Computer-based Instruction	Experimental, Practical
PLO12		CLO3	Computer-based Instruction	Experimental, Practical
		CLO4	Project-based Learning	Mini Projects

Course Coordinator: Dr. Ahmed Youssef Kamal El-Deen

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**				
Department Offering the Program	**Civil Engineering Department**				
Department Offering the Course	**Civil Engineering Department**				
Date of Specification Approval	**10/9/2024**				
Course Title	**Civil Drawing (b)**			**Code**	**C 1104**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**2nd Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	1	**0**	**2**	**3**	

2. Professional Information:

2.1. Course description:

Technical expressions of reinforced concrete structures - Projection of RC sections and joints - Technical expressions of steel structures - Projection of steel sections and joints.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	**Classify** steel structures, Projection of steel sections and joints, and Connections Details.
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	**Draw** the Reinforced Concrete structures, Projection of RC sections and joints, and the Reinforcement Details for Each RC Elements with skills.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO1**	**Define** Steel elements and Difference in its Objective in Steel Structures (Remember)
		CLO2	**Draw** different Steel Elements Frames., Trusses, Space Trusses, and Space Frames.
		CLO3	**Model** a proposal of Steel Column Base (Frames and Trusses)
PLO8		**CLO4**	**Describe** different kinds of Reinforced

	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.		Concrete Elements and Difference in their Objective in Concrete Structures.
		CLO5	**Diagram** the Reinforcement Details for RC sections

2.4. Course Topics:

Course Topics	Week	Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction to Steel Structures	1	√				
Steel Beams Connections	2		√			
Steel Beams-Columns Connections	3		√			
	4		√			
Steel Column Base (Frames and Trusses)	5			√		
	6			√		
General Steel Layout	7		√			
Midterm exam	8					
Steel Bridges Connections (Frames and Trusses)	9		√			
	10		√			
Introduction to Concrete Structures and Reinforced Concrete Foundation	11				√	
Reinforced Concrete Floor Plan	12					√
Reinforced Concrete Columns and Foundation Details	13					√
Reinforced Concrete Slabs and Beams Details	14					√
Practical and Oral Exam	15					
Final Exam	16					
Total		**1**	**6**	2	**1**	**3**

2.5. Lab Topics:

Lab Topics	Week	Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction to Steel Structures	1	√				
Steel Beams Connections	2		√			
Steel Beams-Columns Connections	3		√			
	4		√			
Steel Column Base (Frames and Trusses)	5			√		
	6			√		
General Steel Layout	7		√			
Midterm exam	8	√	√			
Steel Bridges Connections (Frames and Trusses)	9		√			
	10		√			

Introduction to Concrete Structures and Reinforced Concrete Foundation	**11**				√	
Reinforced Concrete Floor Plan	**12**					√
Reinforced Concrete Columns and Foundation Details	**13**					√
Reinforced Concrete Slabs and Beams Details	**14**					√
Laboratory exam	**15**	√	√		√	√
Total	**15**	**2**	**6**	**2**	**1**	**3**

2.6 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	√	√	√		
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	Midterm Exam	√	√			
Mini Projects				√	√	√
Assignments					√	√
Summative Assessment Method						
Oral Exam		√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	**Week**	**Weighting of Asses.**
Assignments	**1 - 7 , 9 -14**	**20 %**
Midterm exam	**8**	**26 %**
Mini Projects	**15**	**14 %**
Oral Exam	**15**	**40 %**
Total		**100 %**

2.8. List of Reference:

Course Notes:	Dr. Amr R. Elgamal Notes
Essential Books (Textbooks):	• M. G. Shah, C. M. Kale, S. Y. Patki, Building Drawing: With an Integrated Approach to Built Environment, Tata McGraw-Hill, 2002 • Ying-Kit Choi, Principles of Applied Civil Engineering Design: Producing Drawings, Specifications, and Cost Estimates for Heavy Civil Projects, American Society of Civil Engineers, 2017
Recommended Books:	• David L. Goetsch, Structural, Civil and Pipe Drafting, Cengage Learning,2013
Periodicals, Web Sites, … etc:	**Not used**

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	
	CO1	CO2
PO4	√	
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

Program Learning Outcomes	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
PLO6	√	√	√		
PLO8				√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	PO3	CLO1	● Lecture ● Project-based Learning	● Midterm Exam ● Oral Exam
		CLO2	● Lecture Project-based Learning	● Midterm Exam ● Oral Exam
		CLO3	● Lecture ● Project-based Learning	● Midterm Exam ● Oral Exam ● Mini Projects
PLO8	PO4	CLO4	● Lecture ● Discussion	● Oral Exam ● Assignments ● Mini Projects
		CLO5	● Lecture Discussion	● Oral Exam ● Assignments ● Mini Projects

Course Coordinator: Dr. Amr Ramadan Elgamal

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**			
Department Offering the Program	**Civil Engineering Department**			
Department Offering the Course	**Civil Engineering Department**			
Date of Specification Approval	**10/9/2024**			
Course Title	Engineering Applications (1 - b) √		**Code**	**C1106**
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**2nd Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	1	**-**	**2**	**3**

2. Professional Information:

2.1. Course description:

The Main Elements of Structures, Construction Techniques, Building by Bricks, Soil Investigation, Types of Foundations, Retaining Works, Excavation Works, Foundation Planning, Filling Works.

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**	**Master** different types of Building Structures, precautions of execution, Steel types, usage, bending list and formworks
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Calculate quantities of all types of civil work (excavation, concrete works, insulation **,**inventory works,, …..etc).

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**CourseLearning Outcomes**	
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO1**	**Discuss** Plan, supervise and monitor implementation of buildings primary works
		CLO2	**Calculate** quantities and cost of materials for buildings primary works
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water	**CLO3**	**Apply** engineering techniques to understanding of standard specification and quality control for

	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.		materials of buildings.
		CLO4	**Use** rate of implementation of construction execution to Calculate required the number of workers, technicians, and duration time.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction of Form Works	**1**	√	√		
Foundation Form works	**2**	√	√		
Shuttering of Columns, Slabs,…..etc	**3,4,5**	√	√	√	√
Quiz	**6**		√		
Inventory Works	**7**	√	√	√	
Mid term	**8**				
Brick Types	**9,10**	√	√	√	
Brick Usage / Inventory Works	**11,12,13**	√	√	√	
Water & Heat Insulation	**14**	√	√		
Practical and Oral Exam	**15**				
Final Exam	**16**				
Total		**12**	**13**	**9**	**3**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Shuttering	**4**	√	√	√	
Brick works	**12**	√	√	√	
Total					

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√	√	√
2. Discussion		√		√
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

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Quiz		√		√
	Midterm Exam	√	√	√	√
Assignments			√	√	√
Summative Assessment Method					
Oral exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	**2&3&5&11&12**	**20 %**
Quiz	**7**	**10 %**
Mid-term exam	**8**	**30 %**
Oral exam	**15**	**40 %**
Total		**100 %**

2.8. List of Reference:

Course Notes:	- Staff lectures notes
Recommended Books:	Encyclopedia El-Bakary
Periodicals, Web Sites, … etc:	

2.9. 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	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO6	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	PO6	CLO1	• Lecture. • Practical-based Learning.	• Mid-Term Exams. • Oral exam
		CLO2	• Lecture. • Discussion.	• Mid-Term Exams. • Oral Exam • Assignments.
PLO11	PO1	CLO3	• Lecture. • Practical-based Learning.	• Mid-Term Exams. • Quiz. • Oral exam
		CLO4	• Lecture. • Discussion.	• Mid-Term Exams. • Quiz • Oral Exam • Assignments

Course Coordinator: Dr. Amir Sabry Ibrahim

Head of Department: Prof. Dr. Hala Refat Date:

10 / 9 /2024

مقررات الفرقة الثانية

Second Year

مقررات الفرقة الثانية

Second Year - 1

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**			
Department Offering the program	**Civil Engineering Department**			
Department Offering the course	**Basic Engineering Department**			
Date of Specification Approval	**10/9/2024**			
Course Title	Mathematics (5 - a)		**Code**	B 1217
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**2nd Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	0	5

2. Professional Information:

2.1. Course description:

Functions of a Complex variable: Complex numbers and the complex plane. Cauchy-Riemann conditions and analytic functions. Complex differentiation. Conformal transformations. Some elementary transformations (linear function, rational and bilinear functions, irrational functions, the exponential function, trigonometric functions). Complex integration. Taylor's and Laurent's series. Contour integration. Applications for steady state heat distribution and elasticity. Mathematical Programming Problems: Graphical approach of linear programming. The simplex method. Application to the transportation problem.

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 applied engineering problems.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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
PLO2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective	**CLO3**	Evaluate the suitable solution methods for various mathematics elements

	engineering judgment to draw conclusions.		

2.4. Course Topics:

Course Topics	Week	CLO1	CLO2	CLO3
Functions of a Complex variable: Complex numbers and the complex plane.	**1&2**	√	√	
Cauchy-Riemann conditions and analytic functions.	**3**		√	
Complex differentiation.	**4&5**	√		
Conformal transformations. Complex integration.	**6&7**	√	√	
Midterm Exam	**8**			
Some elementary transformations	**9**	√		√
Taylor's and Laurent's series.	**10**	√		
Contour integration	**11**		√	√
The exponential function, trigonometric functions.	**12**	√	√	√
Mathematical Programming Problems**.**	**13**		√	√
Graphical approach of linear programming.	**14**	√		
Practical and Oral Exam	**15**			
Final Exam	**16**			
Total		**10**	**8**	**4**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered		
		CLO1	CLO2	CLO3
Formative Assessment Method				
Tests	**Midterm Exam**	√	√	
	Quizzes		√	
Assignments				√
Discussion		√		√
Final Exam		√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	8	20%
Discussion	3,6,9,11	10%
Assignments	12	5%
Quiz	6	5%
Final Exam	16	60%
Total		**100%**

2.8. List of Reference:

Course Notes:	Lecture notes
Essential Books (Textbooks):	1. 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

2.9. 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
PO1	√

3.2. Course Objectives VS Course Learning Outcomes

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

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes		
	CLO1	CLO2	CLO3
PLO1	√	√	
PLO2			√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	**PO1**	**CLO1**	• Lecture • Tutorials • Discussion	• Midterm Exam • Final Exam • Discussion
		CLO2	• Lecture • Tutorials	• Midterm Exam • Final Exam • Quiz
PLO2		**CLO3**	• Discussion	• Assignments • Discussion

Course Coordinator: Dr. Tamer Rageh

Head of Department: Prof. Dr. Hala Refat Dat

10 / 9 /2024

Course Specification

1. Basic Information:

Department Offering the program	**Civil Engineering Program**				
Department Offering the course	**Basic Engineering Sciences Department**				
Date of Specification Approval	**10/9/2024**				
Course Title	**Mathematics (5) (b)**			**Code**	**B 1218**
Type	**Compulsory ☒**		**Elective ☐**		
Semester	**2nd Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**0**	**5**	

2. Professional Information:

2.1. Course description:

Numerical Methods: Least square approximation. Lagrange, Newton and Hermite interpolations. Newton-Cotes and Steifel integration methods. Numerical solution of a system of linear and nonlinear equations. One step and multi-step methods for the solution of initial value problems in ordinary differential equations. Finite difference methods for boundary value problems in ordinary differential equations and initial-boundary value problems for partial differential equations. Computational
continuum mechanics (fluids, elasticity and soil mechanics).

Probability and Statistics: The probability space. Conditional probability. Probability functions and distributions. Basic theorems. Discrete and continuous distributions. Statistical estimation. Tests of hypotheses.

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	Explain different methods for solving system of equation numerically ,applications of numerical in interpolation and differential equations. initial-boundary value problems for partial differential equations. Computational continuum mechanics.
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	CO2	Select The probability space. Conditional probability. Probability functions and distributions. Basic theorems. Statistical estimation. Tests of hypotheses.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Identify types of solutions of ordinary differential equations.
		CLO2	Explain how to use all items of the course in applied engineering problems
PLO3		CLO3	Evaluate the suitable solution methods for various mathematics elements

	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.		
		CLO4	Analyze the different problems and verifications

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Numerical solution of a system of linear and nonlinear equations. Least square approximation.	**1**	√	√		
Lagrange, Newton and Hermite interpolations. Newton-Cotes	**2,3**		√		
Steifel integration methods.	**4&5**	√			
Finite difference methods for boundary value problems in ordinary differential equations	**6&7**	√	√		√
Midterm Exam	**8**				
One step and multi-step methods for the solution of initial value problems in ordinary differential equations.initial-boundary value problems for partial differential equations. Computational continuum mechanics (fluids, elasticity and soil mechanics). The probability space. Conditional probability.	**9-11**	√		√	√
Probability functions and distributions. Basic theorems.	**13**	√	√	√	
Discrete and continuous distributions. Statistical estimation.	**14**		√	√	
Tests of hypotheses.	**15**	√			√
Total	**15**				

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
Methods	**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				

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	**8**	**30%**
Quizzes	**3,11**	**5%**
Discussion	**6,9**	**5%**
Final Exam	**16**	**60%**
Total		**100%**

2.8. List of Reference:

Essential Books (Textbooks):	1. Applied Numerical Methods Using Matlab Won Young Yang, Wenwu Cao And John Morris, John Wiley & Sons, Inc.(2005). 2. Applied Engineering Analysis, Tai-Ran Hsu, published by John Wiley & Sons, 2018 (ISBN 97811119071204) 3. W.J. DeCoursey" Statistics and Probability for Engineering Applications", Elsevier Science (USA),2003. 4. Douglas C. Montgomery and George C. Runger, "Applied Statistics and Probability for Engineers Fifth Edition", John Wiley & Sons,2011. 5. Hwei P. Hsu "Theory and Problems of Probability, Random Variables, and Random Processes" The McGraw-Hill Companies, Inc, 1997.
Periodicals, Web Sites, … etc:	**1.** **https://nm.mathforcollege.com/#sthash.PNSXVhd9.kUtiF6vQ.dpbs** **2.** **https://study.com/academy/topic/probability-and-statistics.html**

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	√	
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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO2			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture • Tutorials	• Midterm Exam, Final Exam
			• Problem-based Learning	• Discussion
		CLO2	• Lecture • Tutorials	• Midterm Exam, Final Exam
			• Problem-based Learning	• Discussion
PLO3	PO2	CLO 3	• Lecture • Tutorials	• Midterm Exam, • Final Exam
			• Problem-based Learning	• Discussion
		CLO4	• Lecture • Tutorials	• Midterm Exam, Final Exam
			• Problem-based Learning	• Discussion

Course Coordinator: Dr. Tamer Rageh

Head of Department: Prof. Dr. Hala Refat Dat

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**				
Department Offering the program	**Civil Engineering Department**				
Department Offering the course	**Civil Engineering Department**				
Date of Specification Approval	**10/9/2024**				
Course Title	Computer Applications (2 - a)			**Code**	C1201
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**1st Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	0	0	3	3	

2. Professional Information:

2.1. Course description:

Computer Applications for Structural Analysis: Determination of internal forces in statically determinate and indeterminate structures (beams, frames & trusses) - Structural deformations - Thermal effect on 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 situation.	**CO1**	Use the finite element program tools
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Analyze the determinate and indeterminate problems

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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**	Simulate different structural element in finite element program
		CLO2	Use different shape of loads

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 different structural element
		CLO4	Determine the deformed shape for different structural elements

2.4. Course Topics:
N.A

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Learn how use finite element program	**1**	√			
Simulate simple beam	**2**	√			
Simulate indeterminate beams	**3**	√			
Simulate frame	**4**	√	√		
Simulate truss	**5**	√	√		
Apply point load	**6**		√		
Apply distributed load	**7**		√		
Midterm exam	**8**				
Learn how display normal force	**9**			√	
Learn how display shear force	**10**			√	
Learn how display bending moment	**11**			√	
Display beam deformed shape	**12**				√
Display frame deformed shape	**13**				√
Display truss deformed shape	**14**				√
Oral and Practical exam	**15**				
Final Exam	**16**				
Total		**5**	**4**	**3**	**3**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1.Computer-based Instruction	√	√	√	√
2.Simulation	√			√
Teaching and Learning Methods for Students with Special Needs:				
Methods				
1. Discussion Session				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Test	Experimental Test	√	√		
Assignment			√	√	√
Mini-Project		√			√
Summative Assessment Method					
Practical Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignment	**3,4,5,6,7,9,10,11,12,13**	**13%**
Mini-Project	**14**	**13%**
Experimental Test	**8**	**34%**
Practical Exam	**15**	**40%**
Total		**100%**

2.8. List of Reference:

Periodicals, Web Sites, … etc:	**https://www.csiamerica.com/**

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 Objective	
	CO1	CO2
PO1	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO2	√	√		
PLO12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Computer-based Instruction • Simulation	Experimental Test Practical Exam Mini-Project
		CLO2	• Computer-based Instruction	Experimental Test Practical Exam Assignment
PLO12	PO6	CLO3	• Computer-based Instruction	Practical Exam Assignment
		CLO4	• Computer-based Instruction • Simulation	Assignment Practical Exam Mini-Project

Course Coordinator: Dr. Ahmed Abdelsalam

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering Program			
Department Offering the course	Civil Engineering Program			
Date of Specification Approval	**10/9/2024**			
Course Title	Engineering Applications (2 - a)		**Code**	C1205
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**1st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	1	-	2	3

2. Professional Information:

2.1. Course description:

Thermal insulation - Water proofing - Plastering - Painting - Flooring - Doors and windows - Sanitary works.

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**	Apply the implementation specification and engineering skills for buildings finishes.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Use specifications standard of codes to specify safety risks, health, economic, environmental, considerations.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO1**	Discuss the plan, supervise and monitor implementation of buildings finishes.
		CLO2	Calculate quantities and cost of materials for buildings finishes.
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical	**CLO3**	Apply engineering techniques in thermal insulation, water proofing and Sanitary works.
		CLO4	Use rate of implementation of

	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.		construction finishes to Calculate required number of workers, technicians and duration time.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Thermal insulation	**1**			√	
Water proofing	**2**			√	
Plastering	**3-5**				√
Painting	**6-7**	√			√
Mid-term	**8**				
Flooring	**9,10**	√			√
Doors and windows	**11**	√			√
Sanitary works	**12**			√	
Quantities and cost of materials	**13,14**		√		√
Oral and Practical exam	**15**				
Final Exam	**16**				
Total		**5**	**2**	**3**	**10**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Flooring	**9**			√	√
Doors and windows	**11**			√	√
Sanitary works	**12**			√	√
Total				**3**	**3**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√	√	√
2. 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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Quiz	√	√		
	Midterm Exam			√	√
Discussions		√	√		
Summative Assessment Method					
Oral Exam				√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Discussions	6,9,13	13 %
Quiz	10,13,14	13 %
Mid-Term Exam	8	34 %
Oral Exam	15	40 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	- Staff lectures notes
Recommended Books:	Encyclopedia El-Bakary Thermal Insulation: A Building Guide ,2015, ISBN 9781632384515
Periodicals, Web Sites, … etc:	https://www.energy.gov/energysaver/types-insulation

2.9. 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	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO6	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	PO6	CLO1	• Lecture.	• Quiz • Discussions
		CLO2	• Lecture.	• Quiz • Discussions
PLO11	PO1	CLO3	• Lecture. • Practical-based Learning.	• Mid-Term Exams. • Oral Exam
		CLO4	• Lecture. • Practical-based Learning.	• Mid-Term Exams. • Oral Exam

Course Coordinator: Dr. Ibrahim Elazab

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**			
Department Offering the Program	**Civil Engineering Department**			
Department Offering the Course	**Civil Engineering Department**			
Date of Specification Approval	**10/9/2024**			
Course Title	Structural Analysis (2 - a)		**Code**	C1211
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**1st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	-	5

2. Professional Information:

2.1. Course description:

Determination of deflection by double Integration and conjugate beam methods - Determination of deflections by virtual work method - Method of three moments equation for analyzing statically indeterminate beams and frames.

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**	Evaluate a wide spectrum of engineering, with analytic, critical, and systemic thinking to solve indeterminate structural problems

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	**CLO1**	Identify the indeterminate structures methods.
		CLO2	Calculate elastic deflections in determinate structures using the double integration method and the virtual work method.
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range	**CLO3**	Evaluate statically indeterminate structures using the three-moment equations.

	of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO4**	Analysis the indeterminate structures methods

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Introduction to statically determinate and indeterminate structures	**1,2**	√			
Double integration method	**3**		√		
Conjugate beam method	**4**		√		
Virtual work method to analyzing the deformation of beam	**5**		√		
Virtual work method to analyzing the deformation of frames	**6**		√		
Virtual work method to analyzing the deformation of trusses	**7**		√		
Midterm exam	**8**				
Virtual work method to analyze the deformation of no-load effect	**9**		√		
Using the three-moment equation to analyze the indeterminate beams.	**10,11**			√	√
Using the three-moment equation to analyze the indeterminate frames.	**12-14**			√	√
Oral and Practical exam	**15**				
Final Exam	**16**				
Total		**2**	**6**	**5**	**5**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2		CLO4
Formative Assessment Method					
Tests	Quiz		√		√
	Midterm Exam	√	√		
Assignments			√		√
Discussion		√	√	√	√
Summative Assessment Method					
Final Exam		√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
assignments	**2-6&9-12**	**6%**
Midterm Exam	**8**	**20%**
Quiz	**3,5,9,11,12**	**6%**
Discussion	**2-6&9-12**	**8%**
Final Exam	**15**	**60%**
Total		**100%**

2.8. List of Reference:

Course Notes:	Not used
Essential Books (Textbooks):	Structural analysis text book
Recommended Books:	Dr/Kassem book & dr/ Hassan hegab book and el dakhakhny book and bazaraa
Periodicals, Web Sites, … etc:	https://mathalino.com/reviewer/strength-materials/deflections-determined-three-moment-equation

2.9. 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
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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture • Tutorials	• Midterm Exam • Discussion • Final Exam
		CLO2	• .Lecture • Tutorials	• Quiz • Midterm Exam • Discussion • Assignments • Final Exam
PLO11		CLO3	• .Lecture • Tutorials	• Quiz • Discussion • Final Exam • Assignments
		CLO4	• .Lecture • Tutorials	• Quiz • Discussion • Final Exam • Assignments

Course Coordinator: Prof. Dr. Hala Mohamed Refaat

Head of Department: Prof. Dr. Hala Refat
Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**				
Department Offering the Program	**Civil Engineering Department**				
Department Offering the Course	**Civil Engineering Department**				
Date of Specification Approval	**10/9/2024**				
Course Title	Concrete Technology			**Code**	1221
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**First Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	2	1	6	

2. Professional Information:

2.1. Course description:

Introduction to concrete as a structural material (History - Advantages - Disadvantages - Components - Quality of concrete) - Mixing water - Concrete manufacture (Batching - Mixing - Transportation - Placing - Compacting - Surface finishing, Repair and curing) - Properties of fresh concrete (Consistency - Workability - Segregation and bleeding) - Properties of hardened concrete (Strength - Shrinkage - Elasticity - creep) - Durability of concrete - Mix design (Empirical methods - Engineered methods) - Non-destructive testing (Rebound hammer - Ultrasonic Pulse velocity and core) - Statistical analysis to judge concrete quality - Concrete admixtures - Special concretes

.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Evaluate the existing reinforced concrete structures.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Construct reinforced concrete structures with attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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** appropriate experiments on fresh and hardened concrete.
		CLO2	**Evaluate** appropriate experiments on Non-destructive testing.
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	**Choose** suitable materials and techniques for concrete manufacturing.
		CLO4	**Determine** the properties of fresh, hardened, and Special concrete.
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.	**CLO5**	**Design** of concrete mix to fulfill specific requirements.
		CLO6	**Assess** Durability of concrete and concrete quality.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to concrete as a structural material	**1**			√			
Mixing water	**2**			√			
Concrete manufacture (I)	**3**			√			
Concrete manufacture (II)	**4**	√	√	√	√		
Properties of fresh concrete	**5**			√	√		
Properties of hardened concrete (I)	**6**	√	√	√	√		
Properties of hardened concrete (II)	**7**			√	√		
Mid-term Exam	**8**			√	√		
Durability of concrete	**9**						√
Mix design (I)	**10**	√	√		√	√	
Mix design (II)	**11**					√	
Statistical analysis to judge concrete quality	**12**						√
Concrete admixtures	**13**					√	

Special concretes	**14**				√	√	
Experimental / Oral Exam	**15**				√		
Final exam	**16**			√	√	√	√
Total		**3**	**3**	**7**	**6**	**4**	**2**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Fresh Concrete tests	**4**	√	√		√		
Hardened Concrete tests	**6**	√	√		√		
Non-destructive testing	**10**	√	√		√		
Total	**3**	**3**	**3**		**3**		

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1.Lecture			√	√	√	√
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						

2.7 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	Oral Exam	√	√		√		
	Midterm Exam			√	√		
	Experimental	√	√		√		
Assignments				√	√	√	√
Summative Assessment Method							
Final Exam				√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	**2 - 6 & 9 - 14**	**7%**
Midterm Exam	**8**	**13%**
Experimental	**15**	**5%**
Oral Exam	**15**	**15%**
Final Exam	**16 or more**	**60%**
Total		**100%**

2.8. List of Reference:

Course Notes:	Used
Essential Books (Textbooks):	1- الكود المصري لتصميم وتنفيذ المنشآت الخرسانية - 203. 2- الملحق الثالث للكود المصري لتصميم وتنفيذ المنشآت الخرسانية (دليل الاختبارات المعملية لمواد الخرسانة).
Recommended Books:	1- Concrete Technology, AM Neville, JJ Brooks, Longman, ISBN-10: 0273732196, ISBN-13: 978-0273732198. 2- Properties of Concrete and Structures, P.K. Mehta, Prentice Hall, ISBN-10: 0131671154, ISBN-13: 978-0131671157. 3- أ.د. عبد الكريم عطا. تكنولوجيا الخرسانة" (الجزء الأول والجزء الثاني)، أ.د. أحمد العريان -
Periodicals, Web Sites, … etc:	**https://www.concrete.org** **https://www.cement.org**

2.9. 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	√	
PO6		√

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
PLO2	√	√				
PLO11			√	√		
PLO13					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Practical-based Learning	• Oral Test • Experimental Test
		CLO2	• Practical-based Learning	• Oral Test • Experimental Test
PLO11		CLO3	• Lecture • Tutorial	• Written exam • Assignments
		CLO4	• Lecture • Tutorial • Practical-based Learning	• Written exam • Assignments • Oral Test • Experimental Test
PLO13	PO6	CLO5	• Lecture • Tutorial	• Final exam • Assignments
		CLO6	• Lecture • Tutorial	• Written exam • Assignments

Course Coordinator: Prof. Dr\ Khaled Mohamed El-Sayed

Head of Department: Prof. Dr. Hala Refat Date:

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Civil Engineering Department			
Date of Specification Approval	10/9/2024			
Course Title	Topographic Surveying		**Code**	C1231
Type	Compulsory ☒	Elective ☐		
Semester	First Semester (Second Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	1	1	5

2. Professional Information:

2.1. Course description:

Vertical control – Leveling - Definitions - Methods of determining relative heights - Bench marks Errors - Profile level notes - Topographic maps -contours - Ordinary level - Precise leveling - Grid leveling - Contour lines and volume computations -Trigonometric leveling - Horizontal and vertical curves - Intersection and Resection.

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.
		CO2	Use the surveying techniques and skills using modern surveying instruments effectively in academic/professional fields
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields	**CO3**	Practice the research techniques and self-learning in the survey applications.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements	**CLO1**	Identify the basic principles of topographic survey.
		CLO2	Calculate the reduced level of points and volume of earthwork

	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**	Solve the intersection and resection problems.
		CLO4	Apply the techniques of survey and setting out for curves
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**	Use theodolite instrument for trigonometric leveling.
		CLO6	Apply the basic principles of the Level instrument.
PLO5	Practice research techniques and methods of investigation as an inherent part of learning	**CLO7**	Practice research techniques in the principles of contour map.
		CLO8	Practice research techniques in vertical curves.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Review of plan survey	1					√			
Levelling	2,3	√	√				√		
Gridding and contour lines	4	√						√	
Volumes and Earth – Work Quantities	5,6		√						
Trigonometric Levelling	7	√				√			
Midterm Exam	8								
Trigonometric Levelling	9	√					√		
Intersection and Resection	10,11			√					
Curves	12,13,14				√				√
Experimental and Oral Test	15								
Final Exam	16								
Total		**5**	**4**	**2**	**3**	**2**	**3**	**1**	**3**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Theodolite instrument	1, 10					√			
Level instrument.	2,4,10						√		
Practical Exam	**15**					√	√		
Total						**2**	**3**		

2.6 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. Problem-based Learning	√	√	√	√				
5. Co-operative Learning					√	√		
6. Interactive learning					√	√		
7. 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								

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Formative Assessment Method									
Tests	Midterm Exam	√	√						
	Experimental Test					√	√		
	Oral Test							√	√
Discussion		√	√	√	√				
Observation						√	√		
Report								√	√
Summative Assessment Method									
Final Exam		√	√	√	√				

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-Term	8	16%(20degree)
Discussion	2,4,6,8,10,12	4%(5degree)
Observation	1,3,7,9	3.2%(4degree)
Report	14	4%(5degree)
Experimental Test	15	8%(10degree)
Oral Test	15	4.8%(6degree)
Final Exam	16	60%(75degree)
Total		**100 %**

2.8. List of Reference:

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

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	CO3
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							√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
PLO2					√	√		
PLO5							√	√
PLO11	√	√	√	√				

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment
PLO2	PO1	CLO5	Practical-based Learning	Experimental Exam
			Co-operative Learning	Observation
			Interactive learning	
		CLO6	Practical-based Learning	Experimental Exam
			Co-operative Learning	Observation
			Interactive learning	
PLO5	PO5	CLO7	Reports	Oral Exam
				Report
		CLO8	Report	Oral Exam
				Report
PLO11	PO1	CLO1	Lecture	Midterm Exam, Final Exam
			Tutorials	
			Problem-based Learning	Discussion
		CLO2	Lecture	Midterm Exam, Final Exam
			Tutorials	
			Problem-based Learning	Discussion
		CLO3	Lecture	Final Exam
			Tutorials	
			Problem-based Learning	Discussion
		CLO4	Lecture	Final Exam
			Tutorials	
			Problem-based Learning	Discussion

Course Coordinator: Dr.Rasha Mohey Al-Deen

Head of Department: Prof. Dr. Hala Refat Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**			
Department Offering the Program	**Civil Engineering Department**			
Department Offering the Course	**Civil Engineering Department**			
Date of Specification Approval	**10/9/2024**			
Course Title	Hydraulics		**Code**	C 1241
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**1st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	1	1	5

2. Professional Information:

2.1. Course description:

Basic concepts of open channel flow - Uniform flow in open channel - Velocity distribution and flow measurements - Non-uniform flow in open channel - Hydraulic jump - Gradually varied flow -Dimensional analysis - Modeling - Hydraulic turbines - 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 situation.	**CO1**	Apply wide sets of experimental civil engineering knowledge to identify and solve different problems related to hydraulic engineering
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Classify different types of flow, dimensional analysis, modelling turbines and pump

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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**	Identify different types of flow such as uniform flow and non-uniform flow
		CLO2	Discuss different types of flow such as gradual varied flow
PLO11	Select appropriate and sustainable technologies for construction of buildings,	**CLO3**	Formulate the dimensional analysis and modelling

	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.	**CLO4**	Illustrate different types of turbines and pump
		CLO5	Explain Basic concepts of open channel flow

2.4. Course Topics:

Course Topics	Week	Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Basic concepts of open channel flow	**1**					√
Uniform flow in open channel	**2**					√
Velocity distribution and flow measurements	**3,4**			√		
Non-uniform flow in open channel	**5,6**			√		√
Hydraulic jump	**7**			√		
Midterm exam	**8**			√		√
Dimensional analysis	**9**			√		
Gradually varied flow	**10,11**			√		
Hydraulic models	**12**			√		
Flow through pipes	**13,14**				√	
Oral and Practical exam	**15**					
Final Exam	**16**			√	√	√
Total				**9**	**2**	**3**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Uniform Flow in Open Channel	**4**	√				
Calibration of Critical Depth Meters	**6**	√				
Energy-Depth Relationship in Open Channel at Constant Discharge	**8**	√				
Discharge- Depth Relationship in Open Channel at Constant specific Energy	**10**		√			
Application of Specific Energy and Momentum Functions	**12**		√			
Total		**3**	**2**			

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
1. Lecture			√	√	√
2. Tutorials			√	√	√
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					

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 & 9 - 13	5 %
Midterm exam	8	20 %
Oral & Experimental	15	15 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	Not used
Essential Books (Textbooks):	Hydraulics of open channel flow, Chanson Butterworth–Heinemann, Oxford, UK, 2018, ISBN-13: 978-0750659789
Recommended Books:	Chadwick, A., Morfett, J. and Borthwick, M. (2021), Hydraulics in Civil and Environmental Engineering, 6th Edn., Published June 8, 2021, by CRC Press. ISBN 9780367460891. Wynn P. (2014), Hydraulics for Civil Engineers by, ICE Publishing. First Edition. ISBN-13: 978-0727758453.

Periodicals, Web Sites, … etc:	Journal of hydraulic Engineering, ASCE https://www.youtube.com/watch?v=bY0PJgnITTI&ab_channel=GerardaMaryShields

2.9. 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	√	
PO6		√

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
PLO2	√	√			
PLO11			√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Lecture • Tutorials	• Oral Test • Experimental Test
		CLO2	• Lecture • Tutorials	• Oral Test • Experimental Test
PLO11	PO6	CLO3	• Lecture • Tutorials	• Written Exam • Assignments
		CLO4	• Lecture • Tutorials	• Final Exam • Assignments
		CLO5	• Lecture • Tutorials •	• Written Exam • Assignments

Course Coordinator: Dr. Tarek Hemdan

Head of Department: Prof. Dr. Hala Refat Date:

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	**Civil Engineering Program**				
Department Offering the course	**Mechanical Program**				
Date of Specification Approval	**10/9/2024**				
Course Title	Industrial safety			**Code**	M1283
Type	**Compulsory** ☒		**Elective** ☐		
Semester	First Semester (Second Year)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	2	0	0	2	

2. Professional Information:

2.1. Course description:

Introduction - Principles of Industrial safety – Risk sources safety requirements (Gases, Dust and Fire}–Occupational diseases and occupational health–Safety regulations for industrial facilities–Prevention and control of industrial risks , accidents and fire – Safety procedures, rescue and evacuation –Safety improvement – Performance evaluation

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**	Evaluate the general rules for the safety of the industrial environment
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO2**	Apply techniques of safe materials handling and explain the concepts used in industrial health
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO3**	Use techniques and skills in establishments to avoid risks leading to accidents.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering, fundamentals, basic science, and mathematics.	**CLO1**	Explain the basics of environmental and chemical monitoring and mitigation strategies in industry
		CLO2	Identify elements of Prevention and control of industrial risks , accidents and fire
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**	Evaluate workplace to determine the existence of occupational safety and health hazards
		CLO4	Analyze hazards and risk assessment of the project
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles	**CLO5**	Describe the dangers associated with fire and the explosion prevention.
		CLO6	Use the fire extinguishing methods

2.4. Course Topics:

Course Topics	Course LO's Covered						
	Week	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Introduction to Professional Safety	**1**	√					
Risk sources safety requirements	**2**	√					
Occupational diseases and occupational health	**3**			√			
Safety regulations for industrial facilities	**4-5**			√			
-Handling of Chemical Materials	**6-7**	√					
Mid term Exam	**8**						
Prevention and control of industrial risks , accidents and fire	**9**		√			√	√

Safety procedures, rescue and evacuation	**10,11**		√			√	√
Safety improvement	**12,13**				√		
Performance evaluation	**14**				√		
Oral and Practical exam	**15**						
Final Exam	**16**						
Total		**4**	**3**	**3**	**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. Lectures.	√	√	√	√	√	√
2. Discussions.		√	√			
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	**Mid-Term Exam**	√		√			
Report			√	√			
Discussions					√	√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.8.1. Assessment Schedule & Grades Distribution

Assessment Method	**Week**	**Weighting of Asses.**
Reports	14	**10%**
Discussions	9-11	**10%**
Mid-term exam	8	**20%**
Final written exam	16	**60%**
Total		**100%**

2.8. List of Reference:

Course Notes:	
Essential Books (Textbooks):	- Althouse, A. "Modern Refrigeration and Air Conditioning" Goodheart-Wilcox - Tenenbaum, D. "Air Conditioning and Refrigeration Toolbox Manual" Arco's on the Job Reference Series
Recommended Books:	- Laboratory Manual "Refrigeration and Air Conditioning" Prenctice Hall
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	CO3
PO1	√		
PO2		√	
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

Program Learning Outcomes	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
PLO1	√	√				
PLO3			√	√		
PLO4					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture	• Midterm Exam • Final Exam
		CLO2	• .Lecture • Discussion	• Final Exam • Report
PLO3	PO2	CLO3	• Lecture • Discussion	• Midterm Exam • Final Exam • Report
		CLO4	• .Lecture	• Discussion • Final Exam
PLO4	PO4	CLO5	• Lecture	• Discussion • Final Exam
		CLO6	• Lecture	• Discussion • Final Exam

Course Coordinator: Assoc. Prof./ Wisam Mohamed Farouk

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

مقررات الفرقة الثانية

Second Year - 2

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	**Structural Analysis (2 - b)**			**Code**	**C1212**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**2nd Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**-**	**5**	

2. Professional Information:

2.1. Course description:

Consistent deformation method - Elastic center method - Slope deflection method - Moment distribution method - Influence line for indeterminate beams and frames.

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**	**Apply** scenarios in Civil Engineering.
		CO2	**Evaluate** Civil Engineering problems of building Apply the principles of mathematics, science and technology in problem and sols technologies, Structures, and construction methods.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	**CLO1**	**Apply** engineering fundamentals to Solve complex engineering problems (Apply)
		CLO2	**Analyze** the data to solve complex engineering problems (Analyze)
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and	**CLO3**	**Select** an appropriate Method to solve Civil Engineering problems (Select)
		CLO4	**Analyze** civil engineering problems to reach proper solutions. (Analyze)

	techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.		

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
The deference between the determinate and the indeterminate structures.	1	√			
Solving the indeterminate beams by the slope deflection method	2		√		
Solving the indeterminate frames by the slope deflection method	3		√		
Solving the indeterminate frames with sidesway by the slope deflection method	4		√		
Solving the indeterminate beams by the moment distribution method	5			√	
Solving the indeterminate frames by the moment distribution method	6			√	
Solving the indeterminate frames with sidesway by the moment distribution method	7			√	
Midterm Exam	8				
Applying examples for the deflection in beams and frames.	9	√		√	
Using the force method to analyze the indeterminate beams.	10				√
Using the force method to analyze the indeterminate frames.	11				√
Using the force method to analyze the indeterminate trusses.	12				√
Using the force method to analyze the indeterminate Composite Structures	13				√
Applying examples for the deformation in beams and frames.	14	√			√
Practical and Oral Exam	15				
Final Exam	16				
Total		**3**	**3**	**4**	5

2.5 Lab Topics
N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Quiz		√	√	√
	Midterm Exam	√	√	√	
Assignments		√	√	√	
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2-6&9-12	10%
Midterm Exam	8	20%
Quiz	13	10%
Final Exam	16	60%
Total		**100%**

2.8. List of Reference:

Essential Books (Textbooks):	Structural analysis, R.C. Hibbeler, 10th Edition, Pearson Prentice Hall, 2017
Recommended Books:	- Structural Analysis, Aslam Kassimali, 6th Edition, Cengage Learning Hall, 2018 - Structural Analysis, Felix Undoeyo, 6th Edition, Temple University Press, 2020 - Dr/Kassem book & dr/ Hassan hegab book and el dakhakhny book and bazaraa

2.9. 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
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	● Lecture ● Discussion	● Midterm Exam ● Assignments
		CLO2	● lecture ● tutorials ● Discussion	● Quizzes ● Midterm Exam ● Assignments
PLO11		CLO3	● lecture ● tutorials ● Discussion	● Quizzes ● Midterm Exam ● Assignments
		CLO4	● tutorials ● Discussion	● Quizzes

Course Coordinator: Prof.Dr. Hala Mohamed Refaat

Dr./ Amr Ramadan El-Gamal

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

2.

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	**10/9/2024**				
Course Title	**Design of Concrete Structures (1)**			**Code**	**C 1252**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**2nd Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**0**	**5**	

2. Professional Information:

2.1. Course description:

Properties of concrete materials - Ultimate limit states design method - Design of section under pure bending moment (Rectangular, L & T - sections) using ultimate limit state method - Load distribution - Check of shear - Simple and continuous beams - Design of one-way and two-ways solid slabs - Design of short columns.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	**Behave** professionally and adhere to engineering ethics and standards.
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO2**	**Use** techniques, skills and modern engineering tools for reinforced concrete structures.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO3**	**Design** the Concrete Structures geometrically & structure

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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.
		CLO2	**Apply** the Principals of designing reinforced concrete elements**.**
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO3**	**Utilize** Egyptian codes for reinforced concrete structures.
		CLO4	**Use** different structural systems for planning the RC buildings.
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**	**Analyze** the different RC structure elements.
		CLO6	**Design** the different reinforcement concrete structural elements according to ECP.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Properties of concrete materials.	**1**	√	√				
Ultimate limit states design method.	**2**		√				
	3	√					√
Design of section under pure bending moment (Rectangular, L & T - sections) using ultimate limit state method.	**4**	√	√				
	5		√				
	6		√	√			√
Load distribution.	**7**				√	√	
Midterm Exam	**8**						
Check of shear.	**9**			√			√
Design Simple and continuous beams.	**10**		√	√			
	11		√	√			
	12			√		√	√

Design of one-way and two-ways solid slabs.	**13**	√	√		√		
Design of short columns.	**14**		√	√			√
Practical and Oral Exam	**15**						
Final Exam	**16**						
Total		**4**	**9**	**6**	**2**	**2**	**5**

2..5 Lab Topics
N.A

2.6 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	√		√			√
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**	**CLO6**
Formative Assessment Method							
Tests	Discussion	√	√		√	√	
	Midterm Exam	√	√	√	√	√	√
Projects	Mini Projects	√		√			√
Assignments		√	√	√	√	√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	**Week**	**Weighting of Asses.**
Assignments	2 to 6 & 9 to 13	8 %
Midterm exam	8	24 %
Mini Projects	7	4 %
Discussion	2 to 6 & 9 to 15	4%
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	Not used
Essential Books (Textbooks):	• Shaker elbehary handbook. • ECP203-2020. • Design of RC Structure halls – DR.M. Hilal • lectures
Recommended Books:	• Design of RC Structure - V. 2 - DR. Mashhour A. Ghoneim.

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	CO3
PO2	√		
PO4		√	
PO6			√

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

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	PO2	CLO1	• Lecture • Tutorials • Project-based Learning	• Written Exam • Mini Projects • Assignments • Discussion
		CLO2	• Lecture • Tutorials	• Written Exam • Assignments • Discussion
PLO4	PO4	CLO3	• Lecture • Tutorials • Project-based Learning	• Written Exam • Assignments • Mini Projects
		CLO4	• Lecture • Tutorials	• Written Exam • Assignments • Mini Projects • Discussion
PLO12	PO6	CLO5	• Lecture • Tutorials	• Written Exam • Assignments • Discussion
		CLO6	• Lecture • Tutorials • Project-based Learning	• Written Exam • Assignments • Mini Projects

Course Coordinator: Dr. Ahmed Saeed Debaiky

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Civil Engineering Department			
Date of Specification Approval	**10/9/2024**			
Course Title	**Hydrology**		**Code**	**C 1242**
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**2nd Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course description:

Introduction: (Hydrologic cycle – Environment and hydrology – Importance of hydrology) – Hydrometeorology: (Solar energy – Temperature – Vapor pressure – Humidity – Wind – Evaporation – evapotranspiration) – Precipitation – Rainfall – Infiltration – Hydromorphlogy: (Watershed – Characteristics – Morphological parameters – Time parameters) – Surface runoff – Soil erosion and sedimentation - Protection works against flash floods – Subsurface hydrology – Water quality and pollution control – Introduction to application of remote sensing and GIS in hydrological studies.

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**	Illustrate the Egyptian water resources, the cause of water shortage, challenges and initiatives to counter the shortage for sustainability.
		CO2	Solve real engineering problems in surface and groundwater hydrology.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	**CLO1**	Identify hydrological components like precipitation, evaporation, infiltration, runoff, and subsurface flow.

		CLO2	Solve practical problems in surface hydrology and groundwater hydrology
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	Apply the available software to perform exercises.
		CLO4	Analyze in quantitative terms the processes of the surface and groundwater hydrology for solving civil engineering problems

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Introduction- Hydrologic cycle	1	√			
Hydrometeorology	2	√			
Precipitation – Rainfall	3	√	√	√	√
Evaporation	4	√	√		√
Infiltration	5	√	√		√
Hydro-morphology	6	√			
Surface Runoff and Stream Flow Hydrograph	7	√	√	√	√
Midterm	8				
Soil erosion and sedimentation	9	√			
Flow Measurements	10	√	√	√	√
Hydrology of the Nile basin	11	√			
Groundwater Hydrology	12	√			√
Constructions and design of wells;	13		√	√	√
Methods of Groundwater Investigations	14		√		√
Introduction to application of remote sensing and GIS in hydrological studies	14			√	
Practical and Oral Exam	**15**				
Final Exam	**16**				
Total		**11**	**7**	**5**	**8**

2.5 Lab Topics

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lectures	√	√		√
2. Tutorials		√	√	√
3. Simulation			√	√
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					
	Midterm Exam	√	√		√
	Quizzes	√	√	√	
Mini project				√	√
Summative Assessment Method					
Final Exam		√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quizzes	At end of each topic	5%
Midterm Exam	8	20%
Mini project	14	5%
Oral Test	15	10%
Final Exam	16 and above	60%
Total		100%

2.8. List of Reference:

Essential Books (Textbooks):	Mays, L.W., Ground and surface water hydrology. John Wiley & Sons, Inc., 2012. ISBN: 978-0-470-16987-2
Recommended Books:	Subramanya, K., Engineering Hydrology. 4th Edition 2017.
Periodicals, Web Sites, … etc:	Journal of Hydrology. Elsevier B.V. https://www.sciencedirect.com/journal/journal-of-hydrology

29. 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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO11			√	√

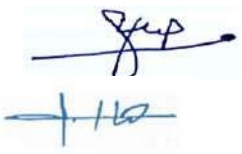
3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture	• written Exam • Quizzes
		CLO2	• Lecture • Tutorial	• written Exam • Quizzes
PLO11		CLO3	• Tutorials • Simulation	• Quizzes • Mini project
		CLO4	• Lecture • Tutorials • Simulation	• written Exam • Quizzes • Mini project

Course Coordinator: Dr. Fahmy Salah Abdelhaleem

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024



Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Architecture Engineering Department			
Date of Specification Approval	**10/9/2024**			
Course Title	**Architecture Design**		**Code**	C1208
Type	**Compulsory** ☒		**Elective** ☐	
Semester	2nd **Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course description:

The architectural elements of buildings (Function -Finishes - Building materials) - Types of covering (Plan roofs - Inclined roofs - Domes) - Service elements (Stairs - Elevators) - Openings (Doors -Windows - Dimensions according to their function - Construction materials) - Introduction to architectural drawings (Axes - Interior and exterior dimensions - Finishes tables).

2.2. Course Objectives (CO):

At the end of course, the student will be able to:

Program objective		Course objective	
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO1**	**Illustrate** techniques and modern engineering tools of construction and finishing materials.
		CO2	Make decisions in the architectural issues.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO1**	**Identify** all necessary construction, technology and architectural drawings that meet technical requirements.
		CLO2	**Discuss** the constraints of: project financing.
PLO8	Communicate effectively –graphically,	**CLO3**	**Apply** the methods and mechanisms of architectural drawings.

	verbally and in writing – with a range of audiences using contemporary tools.	**CLO4**	**Use** graphically, verbally and in writing communication skills

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to course content	**1**	√		√	√
Explain how to draw working plans	**2,3,4**	√	√	√	√
Explain how to draw working sections	**5,6**	√	√	√	√
Mid-term Exam	**8**				
Explain how to draw working elevations	**9**	√	√	√	√
Explain how to draw working layout	**10,11**	√	√	√	√
Explain how to draw working wall sections	**12**	√		√	√
Explain how to draw working details	**13,14**	√		√	√
Practical and Oral Exam	**15**				
Final Exam	**16**				
Total		**13**	**8**	**13**	**13**

2.5 Lab Topics
N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture			√	√
2. Tutorials			√	√
3. Projects based Learning			√	√
4. presentation		√		
5.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

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Midterm Exam			√	√
Mini-Projects		√	√	√	√
Assignments				√	√
Report		√	√		
Summative Assessment Method					
Final Exam		√		√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-term Exam	8	12%
Oral-Projects	15	20%
Assignments	2-7,9- 13	8%
Final Exam	16	60%
Total		100%

2.8. List of Reference:

Essential Books (Textbooks):	محمد أحمد عبد الله. 2018.الرسوممت النفيذيذو مالنيتلوذل المرمترذوو. مكنبوو انفلووم الملرذو. ملر.
Recommended Books:	R Conway and Roenisch, 1987, Understanding Architecture, Routledge of Keegan, London
Periodicals, Web Sites, … etc:	http:// www.greatbuilding.com http:// www.architecture.com

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
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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO5	√	√		
PLO8			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO5	PO5	CLO1	• Self-learning.	• Mini-Projects • Report • Final exam
		CLO2	• Presentation.	• Mini-Projects • Report
PL08		CLO3	• Lectures • Tutorials • Projects based Learning	• Written exam • Assignments • Mini-Projects
		CLO4	• Lectures • Tutorials • Projects based Learning	• Written exam • Assignments • Mini-Projects

Course Coordinator: Ass.Pro.Dr Ahmed Elsaadany

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	**10/9/2024**				
Course Title	**Computer Applications (2 - b)**			**Code**	**C1202**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**2nd Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	0	**0**	**3**	**3**	

2. Professional Information:

2.1. Course description:

Computer Applications for Design of Reinforced Concrete Structures (Design of columns and beams) - Data Base Forming - Curves and Charts Drawing – Optimization.

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**	**Apply** a excel program tool
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO3**	**Generate** the optimization in excel

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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**	Simulate different equation
		CLO2	Analyze different element

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**	Apply different curves and charts
		CLO4	Explore data base forming

2.4. Course Topics:
L.T

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Learn how use equation	**1**	√			
Simulate and analyze equation of columns	**2,3,4&5**	√	√		
Simulate and analyze equation of beams	**6&7**	√	√		
Midterm exam	**8**				
Simulate and analyze equation of beams	**9&10**	√	√		
Simulate different curves and charts	**11&12**			√	
Explore data base forming	**13&14**				√
Practical exam	**15**				
Final exam	**16**				
Total		**9**	**8**	**2**	**2**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. 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	Experimental Test			√	
Assessment		√	√	√	√
Summative Assessment Method					
Practical Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quizzes	**9,10,11,12,13,14**	**20%**
Assessment	**4,6**	**10%**
Midterm Exam	**8**	**30%**
Practical	**15**	**40%**
Total		**100%**

2.8. List of Reference:

Periodicals, Web Sites, … etc:	**https://www.c**siamerica**.**com/

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 Objective	
	CO1	CO2
PO1	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO2	√	√		
PLO12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Computer-based Instruction	• Assessment • Practical Exam
		CLO2	• Computer-based Instruction	• Assessment • Practical Exam
PLO12	PO6	CLO3	• Computer-based Instruction	• Assessment • Practical Exam • Experimental Test
		CLO4	• Computer-based Instruction	• Assessment • Practical Exam

Course Coordinator: Dr. Ahmed Abdelsalam

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	**10/9/2024**				
Course Title	Engineering Applications (2 - b)			**Code**	**C1206**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**2st Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	1	**-**	**2**	**3**	

2. Professional Information:

2.1. Course description:

Construction of Steel Structures (Cutting - Drilling - Shaping - Welding - Bolts - Erection – Cladding).

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**	**Apply** of implementation specification and engineering skills for construction of steel structures.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	**Use** specifications standard of codes to specify safety risks, health, economic, environmental, considerations.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO1**	**Discuss** Plan, supervise and monitor implementation of steel structures.
		CLO2	**Calculate** quantities and cost of materials for steel.
PLO11	Select appropriate and sustainable technologies	**CLO3**	**Apply** engineering

	for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.		techniques to understanding of standard specification and quality control for steel materials.
		CLO4	**Use** rate of implementation of steel structures to calculate duration time of project.

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Construction of Steel Structures (Layout)	**1**	√			
Construction of Steel Structures (Calculate of different loads)	**2**	√			
Cutting	**3,4**	√	√		√
Drilling	**5,6**	√	√		√
Shaping	**7**	√	√	√	√
Mid term	**8**				
Welding	**9,10**	√	√	√	√
Bolts	**11,12**	√	√		√
Erection – Cladding	**13,14**	√	√	√	√
Oral and Practical exam	**15**				
Final Exam	**16**				
Total		**13**	**11**	**5**	**11**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Cutting	**5**	√		√	
Drilling	**7**	√		√	
Welding	**12**	√		√	
Total		**3**		**3**	

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture	√	√		√
2. Discussion		√	√	√
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

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Quiz		√		√
	Midterm Exam	√	√		√
Assignments			√	√	√
Summative Assessment Method					
Oral exam		√		√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2,3,5,11,12	20 %
Quiz	7	10 %
Mid-term exam	8	30 %
Oral exam	15	40 %
Total		**100 %**

2.8. List of Reference: (max. five years ago)

Course Notes:	- Staff lectures notes
Recommended Books:	Steel structures design by Prof Dr. Abdelrahim Khalil Dessouki
Periodicals, Web Sites, … etc:	

2.9. 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	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO6	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	PO6	CLO1	• Lecture. • Practical-based Learning.	• Mid-Term Exams. • Assignments. • Oral exam
		CLO2	• Lecture. • Discussion.	• Quiz • Mid-Term Exams. • Assignments.
PLO11	PO1	CLO3	• Discussion. • Practical-based Learning.	• Assignments. • Oral exam
		CLO4	• Lecture. • Discussion.	• Quiz • Mid-Term Exams. • Assignments

Course Coordinator: Dr. Ayman Abd-allah Zaky

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**				
Department Offering the Program	**Civil Engineering Department**				
Department Offering the Course	**Civil Engineering Department**				
Date of Specification Approval	**10/9/2024**				
Course Title	Profession and Society			**Code**	C 1204
Type	**Compulsory** ☒		**Elective** ☐		
Semester	2nd Semester				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	0	0	3	

2. Professional Information:

2.1. Course description:

Basic concepts in the study of human social behavior - The labor force - Social structures of the workplace - Relation between profession and society - The role of civil engineer - The society problems with respect to the field of Civil engineering (Housing - Water - Sewage - Traffic and transportation - New communities).

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**	**Build** strong relationships with team members and promote collaboration and teamwork.
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO2**	**Apply** the engineering principles and their applications in civil engineering sites, to gain practical experience in using a range of modern engineering tools.
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO3**	**Apply** a set of skills and habits that allow individuals to continuously learn and adapt to new information and challenges in their chosen field.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO1**	**Explain** the environmental issues related to civil engineering projects.
		CLO2	**Identify** Social structures of the workplace
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO3**	**Define** the codes of practice and standards related to civil engineering projects.
		CLO4	**Discuss** The society problems with respect to the field of Civil engineering
PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**CLO5**	**Apply** the profession principles related to civil engineering projects.
		CLO6	**Identify** Relation between profession and society
PLO10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	**CLO7**	**Apply** knowledge, and ethics in different civil engineering projects.
		CLO8	**Identify** The role of civil engineer

2.4. Course Topics:

Course Topics	Week	Course LO's Covered							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Basic concepts in the study of human social behavior.	1, 2	√	√	√					
The labor force	3, 4			√	√				
Social structures of the workplace	5, 6	√				√	√		
Relation between profession and society	7		√		√		√		
Midterm Exam	8								
The role of civil engineer	9	√						√	√
The society problems with respect to (Housing – Water)	10,11					√			√
The society problems with respect to Sewage - Traffic and transportation)	12,13		√					√	
The society problems with respect to New communities.	14	√					√		√
Practical and Oral Exam	15								
Final Exam	16								
Total		**7**	**6**	**4**	**3**	**4**	**4**	**3**	**5**

2.5. Lab Topics:
N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
1. Lecture	√	√						
2. Report			√	√	√	√	√	√
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								

2.7 Assessment Methods

Assessment Methods:	Course LOs Covered							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Formative Assessment Method								
Tests Midterm Exam	√	√						
Reports			√	√	√	√	√	√
Presentation			√	√				
Summative Assessment Method								
Final Exam	√	√						

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm exam	8	13%
Report	4, 12	10%
Presentation	4, 12	10%
Final exam	16	67%
Total		**100%**

2.8. List of Reference:

Essential Books (Textbooks):	قواعد واخلاقيات ممارسة مهنة الهندسة. نبيل عبدالرازق جاسم، 2013، دار مكتبة البصائر، بيروت، لبنان.
Recommended Books:	مدخل إلي اخلاقيات مهنة الهندسة، يحيي خليف، جامعة الملك فهد للبترول والمعادن

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 Objective		
	CO1	CO2	CO3
PO3	√		
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

Program Learning Outcomes	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
PLO4	√	√						
PLO5			√	√				
PLO7					√	√		
PLO10							√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO4	PO4	CLO1	• Lecture	• Written Exam
		CLO2	• Lecture	• Written Exam
PLO5	PO5	CLO3	• Presentation • Report	• Presentation • Report
		CLO4	• Presentation • Report	• Presentation • Report
PLO7	PO3	CLO5	• Report	• Report
		CLO6	• Report	• Report
PLO10	PO5	CLO7	• Report	• Report
		CLO8	• Report	• Report

Course Coordinator: Dr. Ahmed Elhadary

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

مقررات الفرقة الثالثة

Third Year

مقررات الفرقة الثالثة

Third Year - 1

Course Specification

1. Basic Information:

Department Offering the Program	Civil Engineering Program			
Department Offering the Course	Civil Engineering			
Program Title	Civil Engineering			
Date of Specification Approval	10/9/2024			
Course Title	Technical Report		**Code**	C 1300
Type	Compulsory ☒	Elective ☐		
Semester	First Semester (Third Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	0	0	2	2

2. Professional Information:

2.1. Course description:

Each student prepares a report about a selected topic of civil engineering. The report is submitted and discussed at the end of the term.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO5	Master Self-learning and life-long learning strategies to communicate effectively in academic/professional fields	**CO1**	Collect, analyze, document, and report research clearly, concisely, logically, and ethically.
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	Develop and support professional work habits, including those necessary for effective collaboration and cooperation with other students, instructors, and Service.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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
PLO9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills	**CLO3**	**Develop** skill in composing and revising on the computer documents with formats and language

	to anticipate and respond to new situations.		appropriate for those purposes
		CLO4	**Demonstrate** in your writing the effective communication principles encouraged by professional writers

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to Technical Report Writing-	1-3	√			
Different Parts of a Technical Report (Formatting)	4-7			√	
Midterm Exam	8	N.A			
Discussion in Practice of Technical Report Writing	9-11		√		
What is a Presentation?	12				√
Discussion in a Presentation	13-14				√
Practical Exam	15	N.A			
Final Exam	16	N.A			
Total		3	3	4	3

2.5. Lab Topics:

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
Discussions	√	√		
Report			√	√
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				

2.7 Assessment Methods

Assessment Methods:	Course LOs Covered			
	CLO1	CLO2	CLO3	CLO4
Formative Assessment Method				
Reports	√	√	√	√
Presentation			√	√
Summative Assessment Method				
Oral Exam	√	√		

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Reports	11	20 %
Presentation	14	20 %
Oral Exam	15	60 %
Total		**100 %**

2.8. List of Reference:

Essential Books (Textbooks):	Technical Writing Essentials: Introduction to Professional Communications in the Technical Fields by Suzan Last, University of Victoria, 2018, ISBN 9781550586657 - 31 pages.
Recommended Books:	Van Laan, Krista. "The Insider's Guide to Technical Writing." XML Press, 2022.
Periodicals, Web Sites, … etc:	

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
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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO8	√	√		
PLO9			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO8	PO5	CLO1	• Discussions	• Report • Oral Exam
		CLO2	Discussions	• Report • Oral Exam
PLO9	PO3	CLO3	• Report • Presentation	• Report • Presentation
		CLO4	• Report • Presentation	• Report • Presentation

Course Coordinator: Dr. Ibrahim Mohamed El-Shenawy

Head of Department: Prof. Dr. Hala Refaat

Date: ١٠/ 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering program				
Department Offering the Program	Civil Engineering				
Department Offering the Course	Civil Engineering				
Date of Specification Approval	10/9/2024				
Course Title	Personals Skills			**Code**	C 1301
Type	Compulsory ☒		Elective ☐		
Semester	First Semester (Third Year)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	0	0	2	2	

2. Professional Information:

2.1. Course description:

Communication - Critical thinking and problem solving - Leadership - Negotiation - Self-directed learning.

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**	Apply Leadership skills, critical thinking and problem-solving skills and negotiation skills
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO2**	Apply Self-directed learning and communicate effectively in academic/professional fields.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO1**	Apply the concept of communication that help the student to communicate by using contemporary tools
		CLO2	Apply Self-directed learning
PLO9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO3**	Understand the concept of negotiation
		CLO4	Understand Critical thinking and problem solving
		CLO5	Apply the concept leadership

2.4. Course Topics:

Course Topics	Week	Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction includes: Personal skill types.	1	√				
Communication types	2-3	√				
Self-directed learning definition.	4-5		√			
Negotiation: Definition, Stages, Skills, and Strategies	6-7			√		
Midterm Exam	8					
What is critical thinking?	9-10				√	
Problem-solving definition and examples.	11-12				√	
What is leadership?	13-14					√
Oral Exam	15					
Final Exam						
Total		3	2	2	4	2

2.5. Lab Topics:

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
Report			√		
Presentation				√	√
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					

2.7 Assessment Methods

Assessment Methods:	Course LOs Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method					
Report			√	√	√
Presentation			√	√	√
Discussion	√	√			
Summative Assessment Method					
Oral Exam	√	√			

2.7.1. Assessment Schedule & Grades Distribution (total mark from 50)

Assessment Method	Week	Weighting of Asses.
Report	7,12	24 %
Presentation	13	12 %
Discussion	2-4	24 %
Oral exam	15	40 %
Total		**100 %**

2.8. List of Reference:

Essential Books (Textbooks):	Mike Markel; Stuart Selber, "Technical Communication", Macmillan Learning, 13th edition, 2021 Afsaneh Nahavandi, "Art and Science of Leadership", Pearson, 7th edition, 2015. James M. Kouzes and Barry Z. Posner, " The Student Leadership Challenge: Five Practices of Exemplary Leaders", Jossey-Bass, 3rd edition, 2018, ISBN: 978-0-470-17705-1 John Butterworth, Geoff Thwaites, "Thinking Skills: Critical Thinking and Problem Solving", 2nd edition, 2016, ISBN-13 : 978-1107606302
Periodicals, Web Sites, … etc:	The student can use the internet network to collect data. https://www.zippia.com/advice/personal-skills/ https://www.betterup.com/blog/self-directed-learning https://www.betterup.com/blog/leadership-characteristics https://www.betterup.com/blog/problem-solving-strategies https://www.betterup.com/blog/critical-thinking-skills https://www.investopedia.com/terms/n/negotiation.asp

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
PO3	√	
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

Program Learning Outcomes	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
PLO 8	√	√			
PLO9			√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO8	PO5	CLO1	• Discussion	• Discussion • Oral exam
		CLO2	• Discussion	• Discussion • Oral exam
PLO9	PO3	CLO3	• Report	• Report • Presentation
		CLO4	• Presentation	• Report • Presentation
		CLO5	• Presentation	• Report • Presentation

Course Coordinator: Dr. Mohab Roshdy Ahmed

Head of Department: Prof. Dr. Hala Refaat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Department Offering the program	Civil Engineering Department				
Department Offering the course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Structural Analysis-3			**Code**	**C1311**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**Fall Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**0**	**5**	

2. Professional Information:

2.1 Course description:

Matrix Structural Analysis for 2D and 3D structures (Stiffness method) - Using computers to perform 2D and 3D analysis of structures.

2.2 Course Objectives

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	Apply engineering science on a lot of structures and analyze the structural elements to solve engineering problems

2.3 Course Learning Outcomes (CLOs)

Program Learning Outcomes		**Course Learning Outcomes**	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	**CLO1**	Determine the unknowns of indeterminate structures.
		CLO2	Analyze the indeterminate structures by stiffness method.
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by	**CLO3**	Illustrate the straining actions of indeterminate structures.

	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.	**CLO4**	Compare the results of stiffness method with computer outputs.

2.4 Course Topics:

Course Topics	**Week**	**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Mathematical models of elements	**1**	√			
Introduction to matrix displacement method	**2**	√			
Analyze of beams by matrix method	**3,4**		√	√	
Analyze of trusses	**5-7**		√	√	
Mid-Term	**8**				
Analyze of frames	**9-11**		√	√	
Space trusses	**12**			√	
Special topics	**13,14**				√
Total	**14**	**2**	**8**	**9**	**2**

2.5 **Lab Topics:**
N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LOs Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1.Lectures	√	√	√	√
2.Tutorials	√	√	√	
Methods				
1. Discussion Session				
2. Extra Lectures				

2.7.1. Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Formative Assessment Method					
Test	**Mid-Term Exam**	√	√	√	
	Quizzes		√	√	√
Assignments		√	√	√	√
Summative Assessment Method					
Final Exam		√	√	√	

2.7.2. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.
Test	Mid-Term Exam	8	20%
	Quizzes	5, 9, 11, 12	10%
Assignments		2- 6, 9- 13	10%
Final Exam		16	60%
Total			**100%**

2.8. List of Reference:

Recommended Books:	"Finite Element Applications", Springer Tracts in Mechanical Engineering, Michael Okereke & Simeon Keates, ISBN 978-3-319-67124-6
Periodicals, Web Sites, … etc:	https://doi.org/10.1007/978-3-319-67125-3

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board
PDF Notes

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• .Lecture, Tutorials	Assignments Mid-term Final Exam
		CLO2	• Lecture, Tutorials	Assignments Quizzes Mid-term Final Exam
PLO11		CLO3	• Lecture, Tutorials	Assignments Quizzes Mid-term Final Exam Assignments,
		CLO4	• Lecture	Assignments Quizzes

Course Coordinator: Prof. Asharf Mohamed Abourayan

Head of Department: Prof. Dr. Hala Refaat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering program				
Department Offering the program	Civil Engineering Program				
Department Offering the course	Civil Engineering Program				
Date of Specification Approval	١٠/9/2024				
Course Title	Photogrammetry and Geodesy			**Code**	C 1331
Type	Compulsory ☒		Elective ☐		
Semester	First Semester (Third Year)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	1	1	5	

2. Professional Information:

2.1. Course description:

Uses of photogrammetry - Types of Aerial photographs - Relief displacement on a vertical photograph - Stereoscope - Parallax - Flight planning - Triangulation and Trialteration - Choice of figures - Measurements of triangulation – Introduction to GPS- Theory of errors and their application in surveying.

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**	Apply wide sets of surveying knowledge, science, and specialized skills.
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO2**	Identify and Evaluate surveying problems using different learning strategies in academic and professional fields.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of	**CLO1**	Identify the geodesy and photogrammetry techniques.
		CLO2	Evaluate the surveying observations by using the statistical analyses.

	civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.		
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO3**	Determine suitable survey instrument and technique for surveying as an inherent part of learning.
		CLO4	Apply the research techniques in application of photogrammetry in surveying.
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 Total Station and Stereoscope in lab.

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Introduction to geodesy	1	√				
Spherical triangles and towers	2	√				
Conditions	3		√			
Strength of figures	4	√				
Introduction to GPS	5	√				
Theory of errors	6,7		√			
Midterm Exam	8					
Total Station	9			√		√
Introduction to photogrammetry	10	√		√	√	√
Aerial Photogrammetry	11	√		√	√	√
Flight planning	12		√			
Parallax	13		√	√		√
Relief Displacement	14		√			
Practical Exam	**15**					
Final Exam	**16**					
Total		**6**	**6**	**4**	**2**	**4**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Total Station1	9					√
Total Station2	10					√
Stereoscopic Instrument1	11					√
Stereoscopic Instrument2	12					√
Total						**4**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
1. Lecture	√	√			
2. Tutorials	√	√			
3. Practical-based Learning					√
4.Report				√	
5. 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					

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm exam	8	20%
Oral Test	15	10%
Experimental Test	15	10%
Final exam	16 and above	60%
Total		**100%**

2.8. 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:	1. 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 2. Surveying Engineering & Instruments- Valeria Shank- First Edition-2012- ISBN 978-81-323-4403-2

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 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

Program Learning Outcomes	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
PLO2					√
PLO5			√	√	
PLO11	√	√			

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO11	PO1	CLO1	• Lecture • Tutorials	• Midterm Exam • Final Exam
		CLO2	• Lecture • Tutorials	• Midterm Exam • Final Exam
PLO5	PO5	CLO3	• Self-Learning	• Final Exam • Oral Test
		CLO4	• Report	• Report • Oral Test
PLO2	PO1	CLO5	• Practical-based Learning	• Experimental Test • Oral Test

Course Coordinator: Dr. Ahmed Elhadary

Head of Department: Prof. Dr. Hala Refaat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Design of Concrete Structures(2-a)			**Code**	C 1351
Type	Compulsory ☒		Elective ☐		
Semester	First Semester (Third Year)				
Teaching Hours	Lec.	Tut.	Lab.	Contact hours	
	3	2	0	5	

2. Professional Information:

2.1. Course description:

Design of Concrete Structures: Design of hollow block slabs - Design of paneled beams - Design of flat slabs - Torsion - Design of sections subjected to bending moment and axial force - Check stresses for sections under bending moment and axial force - Frames - Design of stairs - Design of deep beams - Design of short cantilever.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Behave professionally and adhere to engineering ethics and standards for the reinforced concrete structures.
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO2**	Use techniques, skills and modern engineering tools for reinforced concrete structures.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO3**	design the Concrete Structures geometrically & structure

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic,	**CLO1**	**Apply** knowledge to choose the better type of structural system.

	environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**CLO2**	**Apply** knowledge to choose the most economical system.
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO3**	**Use** different structural systems for planning the RC buildings.
		CLO4	**Utilize** Egyptian codes for reinforced concrete structures.
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**	**Analyze** the different RC structure elements.
		CLO6	**Design** the different reinforcement concrete structural elements according to ECP.

2.4. Course Topics:

Course Topics	**Week**	**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Introduction in design of concrete structures	**1**	√					
Design of hollow block slabs - Design of hidden beams	**2,3**			√	√		√
Design of paneled beams	**4,5**			√	√		√
Design of flat slabs	**6,7**				√		√
Midterm Exam	**8**						
Design the reinforced concrete structures subjected to torsion ,bending moment and axial force	**9,10**	√			√	√	√
Design the reinforced concrete frames	**11**		√	√	√		√
Design of stairs	**12**		√		√		√
Design of short cantilever	**13**		√		√		√
Design of deep beams	**14**		√		√		√
Practical Exam	**15**	**N. A**					
Final Exam	**16**						
Total		**3**	**4**	**5**	**12**	**2**	**12**

2.5. Lab Topics:

N.A

2.6 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		√			√	√
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	CLO6
Formative Assessment Method							
Tests	Oral Test		√			√	√
	Midterm Exam	√		√	√		√
Mini Projects			√			√	√
Assignments		√	√	√	√	√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 & 9 -13	5 %
Midterm exam	8	20 %
Mini Projects	15	10 %
Oral	15	5 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference: (max. five years ago)

Course Notes:	Not used
Essential Books (Textbooks):	• Shaker elbehary hand book, . • Egyptian code ECP203-2020. • Design of RC Structure halls – DR.M. Hilal • lectures
Recommended Books:	• Design of RC Structure - V. 2 - DR. Mashhour A. Ghoneim.

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	CO3
PO2	√		
PO4		√	
PO6			√

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

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	PO2	CLO1	• Lecture • Tutorials	• Final Exam • Midterm Exam • Assignments
		CLO2	• Lecture • Tutorials • Project-based Learning	• Midterm Exam ,Final Exam • Assignments • Mini Projects • Oral Test
PLO4	PO4	CLO3	• Lecture • Tutorials	• Midterm Exam • Final Exam • Assignments
		CLO4	• Lecture • Tutorials	• Midterm Exam • Final Exam • Assignments
PLO12	PO6	CLO5	• Lecture • Tutorials • Project-based Learning	• Final Exam • Assignments • Mini Projects • Oral Test
		CLO6	• Lecture • Tutorials • Project-based Learning	• Midterm Exam ,Final Exam • Assignments • Mini Projects • Oral Test

Course Coordinator: Prof. Dr. Gamal Ismail

Head of Department: Prof. Dr. Hala Refaat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Geotechnical Engineering (a)			**Code**	C 1361
Type	Compulsory ☒		Elective ☐		
Semester	First Semester (Third Year)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	1	1	5	

2. Professional Information:

2.1. Course description:

Introduction to Geotechnical Engineering -Definitions and Relationships - Index properties of Soil - Permeability and Seepage - Seepage through Earth Dams - Stress Distribution in Soil - Shear strength of Soil.

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**	Study the effect of water on soil's behavior in different situations, through the application of engineering principles and skills and laboratory experiments.
		CO2	Select the suitable laws learned through understanding the behavior of soil and the analytical thinking to reach the best design conditions.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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 the experimental data for soil classification, determination of permeability coefficient and soil shear parameters.
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a	**CLO2**	Evaluate the variable soil parameters according to the knowledge of soil properties and classifications.
		CLO3	Evaluate the seepage of water

	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.		in the soil and the flow nets.
		CLO4	Evaluate the stresses on soil due to different loads.
		CLO5	Evaluate the shear strength of a soil mass.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction to Geotechnical Engineering	**1**		√			
Definitions and Relationships	**2**		√			
Index properties of Soil	**3-5**		√			
Permeability and Seepage	**6**			√		
Seepage through Earth Dams	**7**			√		
Midterm Exam						
Stress Distribution in Soil	**9-11**				√	
Shear strength of Soil	**12-14**					√
Practical Exam	**15**					
Final Exam	**16**					
Total			**5**	**2**	**3**	**3**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Determination of water content and unit weight.	**4**	√				
Determination of plastic, liquid limits, and classification of soil.	**5**	√				
Constant and Falling head permeability test.	**7**	√				
Direct shear box test, Triaxial test, and Unconfined test.	**13**	√				
Total		**4**				

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
Lecture		√	√	√	√
Tutorials		√	√	√	√
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					

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 & 9 - 13	4 %
Midterm exam	8	16 %
Oral	15	10 %
Experimental	15	10 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of References:

Course Notes:	Not used
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. • Hemed a, Advances in Soil Mechanics and Foundation Engineering, IntechOpen, London ISBN: 978-1-78984-

	290-6, 2020.
Recommended Books:	• Das, B. M, Soil Mechanics Laboratory Manual, Oxford University Press, 9th. Ed., ISBN 978 – 019 – 020 – 966 – 7, 2016.
Periodicals, Web Sites, … etc:	https://www.geoengineer.org/education/karl-terzaghi/legacy-in-geotechnical-engineering

2.9. 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	CLO5
CO1	√	√	√		
CO2				√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes				
	CLO1	CLO4	CLO5	CLO6	CLO7
PLO2	√				
PLO11		√	√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	**PO1**	**CLO1**	• Practical-based Learning	• Oral Test • Experimental Test
PLO11		**CLO2**	• Lecture • Tutorials	• Midterm Exam • Final Exam • Assignments
		CLO3	• Lecture • Tutorials	• Midterm Exam • Final Exam • Assignments
		CLO4	• Lecture • Tutorials	• Final Exam • Assignments
		CLO5	• Lecture • Tutorials	• Final Exam • Assignments

Course Coordinator: Ass. Prof. Dr. Alnos Aly Eissa

Head of Department: Prof. Dr. Hala Refaat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Design of Steel Structures (1 - a)			**Code**	C1371
Type	Compulsory ☒		Elective ☐		
Semester	First Semester (Third Year)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	2	-	5	

2. Professional Information:

2.1. Course description:

Steel as a construction material - Material properties and steel sections - Steel design codes and the Allowable Stress Design method (ASD) - Design of tension members. Design of axially loaded compression members - Behavior of short columns - Behavior of slender columns - Elastic and inelastic buckling - Design of columns - Effective length concept - Columns in braced and unbraced frames - Design of flexure members - Types and classification of beam cross sections - Bending strength of compact and non-compact cross sections - Design of laterally supported beams - Lateral-torsional buckling - Design of laterally unsupported beams - Design of beam-columns (combined axial and flexural forces) - Design of bolted connections - Bearing type and friction type bolted connections - Design of welded connections.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Using a structural analysis principles to get a critical cases for design steel element.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Construction, design of steel elements according to standard codes.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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.
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.
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)

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Steel as a construction material - Material properties and steel sections	**1**	√	√				
Steel design codes and the Allowable Stress Design method (ASD)	**2**	√	√	√			
Design of tension members	**3**			√			
Design of axially loaded compression members	**4**				√	√	√
Design of flexure members -	**5**				√	√	√
Design of laterally supported beams	**6,7**			√	√	√	√
Midterm Exam	**8**						
Design of laterally unsupported beams	**9**				√	√	√
Design of welded connections.	**10,11**				√		

Design of bolted connections (Bearing type)	**12**				√		
Design of bolted connections (Friction type)	**13**				√		
Computer application by excel	**14**				√		
Practical Exam	**15**	**Not Applicable**					
Final Exam	**16**						
Total		**2**	**2**	**4**	**10**	**5**	**5**

2.5. Lab Topics:

N.A

2.6 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						

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	**Week**	**Weighting of Asses.**
Assignments	4,7,10,12,13	5 %
Quiz	5,9,11	5 %
Mid-term exam	8	30 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	- Staff lectures notes
Essential Books (Textbooks):	1- Egyptian code for design of steel structure 2- Steel structures design by Prof Dr. Abdelrahim Khalil Dessouki, ISBN: 977-5423-65-1, (2018).
Recommended Books:	1- Steel design hand book by. Prof Dr. Bahaa M. Mashaly Part 1 Steel design hand book by. Prof Dr. Bahaa M. Mashaly Part 3 Steel Designers' Manual, by (Steel Construction Institute), Edited by Buick Davison and Graham W. Owens, ISBN-13 9781119249863

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
PO2	√	
PO6		√

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	PO2	CLO1	• Lecture. • Tutorials.	• Assignments. • Written Exams.
		CLO2	• Lecture. • Tutorials.	• Assignments. • Written Exams.
PLO12	PO6	CLO3	• Lecture. • Tutorials.	• Assignments. • Written Exams. • Quiz
		CLO4	• Lecture. • Tutorials.	• Assignments. • Written Exams. • Quiz
PLO4		CLO5	• Lecture. • Tutorials.	• Assignments. • Written Exams. • Quiz
		CLO6	• Lecture. • Tutorials.	• Assignments. • Written Exams. • Quiz

Course Coordinator: Dr. Ayman Abd-allah Zaky

Head of Department: Prof. Dr. Hala Refaat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering program**			
Department Offering the Program	**Civil Engineering**			
Department Offering the Course	**Civil Engineering**			
Date of Specification Approval	**10/9/2024**			
Course Title	Transportation Planning & Traffic Engineering		**Code**	C 1381
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**1st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	1	1	5

2. Professional Information:

2.1. Course description:

Transportation Planning: Introduction to transportation planning - Transportation problem definition and defining study area - Data collection (Origin and destination studies) - Travel forecast (Trip generation - Trip distribution - Modal split - traffic assignment) - Transportation evaluation.
Traffic Engineering: Introduction (Human characteristics and vehicle characteristics) - Traffic volume - Traffic speed - Traffic density – Travel time and delay studies - Traffic flow characteristics - Highway capacity (Two-lane highway) – Parking studies - Traffic control devices – Intersections control (Conflict points at intersections, Types of intersection control) - Traffic signals design - Weaving for intersections, freeways, and expressways.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO1**	Evaluate transportation planning process with respect to design, financing, regulations and policies, environmental related issues, land use and contemporary issues.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Design traffic signal, plan parking area, and evaluate traffic operation

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO1**	Describe study area and the methods of data surveying required for transportation planning.
		CLO2	Predict travel demand
		CLO3	Evaluate transportation project
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**	Calculate Human characteristics and vehicle characteristics
		CLO5	Collect traffic data
		CLO6	Analyze traffic data
		CLO7	Analyze traffic flow characteristics & highway capacity
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.	**CLO8**	Plan parking area
		CLO9	Design of traffic signal

2.4. Course Topics:

Course Topics	Week	Course LOs Covered								
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**
Introduction to transportation planning -	**1**	√							√	
Travel forecast (Trip generation - ……)	**2,3**	√	√							
Transportation evaluation	**4**			√						
Human characteristics and vehicle characteristics	**5**				√					
Traffic data collection and analyzing	**6,7**					√	√			
Midterm exam	**8**									
Traffic flow characteristics	**9**			√				√		
Highway capacity	**10**				√			√		
Parking studies	**11**								√	
Intersections control	**12**									√

Traffic signals design	**13**									√
Weaving for intersections	**14**									√
Practical exam	**15**									
Total	**13**	**3**	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**3**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**								
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**
Traffic data collection	**9-11**					√				
Total	**3**					**3**				

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**								
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**
1. Lecture	√	√	√	√	√	√	√	√	√
2. Tutorials		√	√	√		√	√	√	√
3. Practical-based Learning					√				
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									

2.7 Assessment Methods

Assessment Methods:		**Course LOs Covered**								
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**
Formative Assessment Method										
Tests	Oral Test					√				
	Midterm Exam	√	√	√	√					
Assignments			√	√	√		√	√	√	√
Discussion		√				√				
Mini project						√				
Summative Assessment Method										
Final Exam			√	√	√		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Oral Test	15	8 %
Mini project	15	8 %
Discussion	14	4 %
Assignments	2- 7, 12 - 14	4 %
Midterm exam	8	16 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	Not used
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.
Recommended Books:	----------
Periodicals, Web Sites, … etc:	----------

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Library Usage
laboratory Usage (Field practical)
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO1	CO2
PO5	√	
PO6		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes								
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9
CO1	√	√	√						
CO2				√	√	√	√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes								
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9
PLO 5	√	√	√						
PLO13				√	√	√	√		
PLO12								√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO5	PO5	CLO1	• Lectures • Report	• Midterm Exam • Discussion
		CLO2	• Lectures • Tutorials	• Midterm Exam • Final Exam • Assignments
		CLO3	• Lectures • Tutorials	• Midterm Exam • Final Exam • Assignments
PLO13	PO6	CLO4	• Lectures • Tutorials	• Midterm Exam • Final Exam • Assignments
		CLO5	• Lectures • Practical-based Learning	• Discussion • Oral test • Mini project
		CLO6	• Lectures • Tutorials	• Final Exam • Assignments
		CLO7	• Lectures • Tutorials	• Final Exam • Assignments
PLO12		CLO8	• Lectures • Tutorials	• Final Exam • Assignments
		CLO9	• Lectures • Tutorials	• Final Exam • Assignments

Course Coordinator: Dr Ayman Abdelhamid

Head of Department: Prof. Dr. Hala Refaat

Date: 10 / 9 /2024

مقررات الفرقة الثالثة

Third Year - 2

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Civil Engineering Department			
Date of Specification Approval	10/9/2024			
Course Title	Design of Concrete Structures (2 - b)		**Code**	**C 1352**
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**2nd Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course description:

Design of Concrete Structures: Analysis of columns - Shear walls - Halls - Indirect lighting roofs (saw-tooth) - Arched systems (slab -girder) - Trusses - Vierendeel - Prestressed beams (simple beams) - Serviceability limit states (deflection - crack width) - Types of joints (construction - shrinkage - expansion)- Short cantilever - Deep beam.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	Use techniques, skills and modern engineering tools for reinforced concrete structures.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Design the Concrete Structures geometrically & structure

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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	**CLO1**	**Apply** knowledge to choose the better type of structural system.

	appropriate to the discipline and within the principles and contexts of sustainable design and development.	**CLO2**	**Apply** knowledge to choose the most economical system.
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO3**	**Use** different structural systems for planning the RC buildings.
		CLO4	**Utilize** Egyptian codes for reinforced concrete structures.
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**	**Analyze** the different RC structure elements.
		CLO6	**Design** the different reinforcement concrete structural elements according to ECP.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Analysis of columns	1	√	√	√			
	2				√	√	√
Prestressed beams (simple beams)	3	√	√	√			
	4				√	√	√
Halls + Indirect lighting roofs (saw-tooth)	5	√	√		√		√
Arch slab	6	√	√		√		√
Arch girder	7		√		√	√	√
Mid-term exam	8						
Trusses	9			√	√		√
Vierendeel	10			√	√		√
Shear walls	11		√		√	√	√
Short cantilever + Deep beam	12			√	√		√
Serviceability limit states (deflection - crack width)	13		√		√		√
Types of joints (construction - shrinkage - expansion).	14	√	√		√	√	√
Oral and Practical exam	15						
Final Exam	16						
Total		**5**	**8**	**5**	**11**	**5**	**11**

2.5 Lab Topics

N.A

2.6 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	√	√		√		√
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	CLO6
Formative Assessment Method							
Test	Midterm Exam	√	√	√	√	√	√
Mini Projects		√	√		√		√
Assignments		√	√	√	√	√	√
Discussion		√	√	√		√	
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 , 9 - 13	8 %
Midterm exam	8	24 %
Mini Projects	7	4 %
Discussion	2 - 6 , 9 - 15	4 %
Final exam	16 and above	60 %
Total		**100 %**

2.7. List of Reference:

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

2.8. 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	√	
PO6		√

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	PO6	CLO1	• Lecture • Tutorials • Project-based Learning	• Written Exam • Discussion • Assignments • Mini Projects
		CLO2	• Lecture • Tutorials • Project-based Learning	• Written Exam • Discussion • Assignments • Mini Projects

PLO4	**PO4**	**CLO3**	• Lecture • Tutorials	• Written Exam • Assignments • Discussion
		CLO4	• Lecture • Tutorials • Project-based Learning	• Written Exam • Assignments • Mini Projects
PLO12	**PO6**	**CLO5**	• Lecture • Tutorials	• Written Exam • Assignments • Discussion
		CLO6	• Lecture • Tutorials • Project-based Learning	• Written Exam • Assignments • Mini Projects

Course Coordinator: Prof. Dr. Gamal Ismail

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Geotechnical Engineering (b)			**Code**	C 1362
Type	Compulsory ☒		Elective ☐		
Semester	Second Semester (Third Year)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	1	1	5	

2. Professional Information:

2.1. Course Description:

Soil Compaction - Consolidation of Soil – Lateral Earth Pressure - Stability of Slopes - Difficult Soil - Ground Water and its Control - Stabilization and Improvement - Soil Exploration and Site 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 the fundamental of the nature and properties of soil and its different types through the application of engineering principles and skills and laboratory experiments.
		CO2	Evaluate the laws of soil and the use of analytical and critical thinking to solve the surrounding realistic engineering problems and study the soil-structure interaction to reach the best design conditions.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use	**CLO1**	Determine the maximum dry density of soil corresponding to the optimum moisture content through compaction tests.

	statistical analyses and objective engineering judgment to draw conclusions.	**CLO2**	Determine the soil consolidation parameters for estimating the settlement value.
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	Evaluate the lateral earth pressure.
		CLO4	Evaluate the slopes by checking their stability by different methods.
		CLO5	Illustrate most of the site problems, such as difficult soil, and suggestions solutions for them by making site investigations and soil improvement.
		CLO6	Evaluate the soil settlement by studying soil compressibility and compaction.
		CLO7	Evaluate the best method for dewatering from the site according to soil type and foundation level.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered						
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**
Lateral Earth Pressure	**1**			√				
Lateral Earth Pressure	**2**			√				
Stability of Slopes	**3**				√			
Stability of Slopes	**4**				√			
Soil Compaction	**5**	√					√	
Site Investigation and Soil improvement	**6**	√				√		
Site Investigation and Soil improvement	**7**	√				√		
Midterm	**8**							
Difficult soil	**9**					√		
Consolidation of Soil	**10**						√	
Consolidation of Soil	**11**		√				√	
Consolidation of Soil	**12**		√				√	
Ground Water and its Control	**13**							√

Ground Water and its Control	**14**							√
Practical Exam	**15**							
Final Exam	**16**							
Total		**3**	**2**	**2**	**2**	**3**	**4**	**2**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**						
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**
Determination of the maximum dry density of soil and optimum moisture content.	**5-7**	√						
Determination of the soil consolidation parameters.	**11,12**		√					
Total		**3**	**2**					

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**						
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**
1. Lecture			√	√	√	√	√
2. Tutorials			√	√	√	√	√
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							

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 , 9 - 13	0.8 %
Quiz	2 - 6 , 10 - 13	4.8%
Midterm exam	8	14.4 %
Oral Test	15	12 %
Experimental	15	8 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. 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. • Hemed a, Advances in Soil Mechanics and Foundation Engineering, IntechOpen, London ISBN: 978-1-78984-290-6, 2020.
Recommended Books:	• Das, B. M, Soil Mechanics Laboratory Manual, Oxford University Press, 9th. Ed., ISBN 978 – 019 – 020 – 966 – 7, 2016.
Periodicals, Web Sites, … etc:	https://www.geoengineer.org/education/karl-terzaghi/legacy-in-geotechnical-engineering

2.9. 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	CLO5	CLO6	CLO7
CO1	√	√	√		√		
CO2				√		√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes						
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
PLO2	√	√					
PLO11			√	√	√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Practical-based Learning	• Oral Test • Experimental Exam
		CLO2	• Practical-based Learning	• Oral Test • Experimental Exam
PLO11		CLO3	• Lecture • Tutorials	• Midterm Exam • Quiz • Final Exam • Assignments
		CLO4	• Lecture • Tutorials	• Midterm Exam • Quiz • Final Exam • Assignments
		CLO5	• Lecture • Tutorials	• Final Exam • Assignments
		CLO6	• Lecture • Tutorials	• Midterm Exam • Quiz • Final Exam • Assignments
		CLO7	• Lecture • Tutorials	• Quiz • Final Exam

Course Coordinator: Ass. Prof. Dr. Alnos Aly Eissa

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**			
Department Offering the Program	**Civil Engineering Department**			
Department Offering the Course	**Civil Engineering Department**			
Date of Specification Approval	**10/9/2024**			
Course Title	Design of Steel Structures (1 - b)		**Code**	**C1372**
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**2st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**-**	**5**

2. Professional Information:

2.1. Course Description:

Introduction to composite construction - Design of composite floor beams (Strength requirement - Design of shear connectors - Use of formed metal deck) - Design of composite columns - Flexure design of slender sections - Connection classification and design (Flexible - Rigid - Semi-rigid) - Design of base plates and anchor bolts - Introduction to Load and Resistance Factor Design (LRFD) - Identification of Limit states (Strength limit state and Serviceability limit state)
- Design of tension, compression and flexure members using LRFD approach.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Use structural analysis principles to get critical cases for design steel element.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Construct, design of steel elements according to standard codes.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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 ultimate load design method LRFD.
		CLO2	Apply specified consideration to understand the properties of slender sections and their connections.
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.
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 structure to check the allowable stresses.
		CLO6	Utilize codes of practice and standards of steel structural to check safety requirements (serviceability &deflection)

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Design of hinged bases	**1**				√	√	
Design of fixed bases	**2**				√	√	
Introduction to slender sections	**3**		√				
Flexure design of slender sections	**4**			√	√	√	√
Introduction to composite construction	**5**	√					
Design of composite floor beams (Strength requirement)	**6**			√	√	√	√
Design of composite floor beams (shear connectors)	**7**			√	√	√	√

Midterm	**8**						
Design of composite columns	**9**				√	√	
Connection classification and design (Flexible - Rigid - Semi-rigid)	**10**		√				
Introduction to (LRFD), Identification of Limit states (Strength limit state and Serviceability limit state)	**11**	√					
Design of tension members (LRFD).	**12**			√	√	√	√
Design of compression members (LRFD).	**13**			√	√	√	√
Design of flexure members (LRFD).	**14**			√	√	√	√
Practical and Oral Exam	**15**						
Final Exam	**16**						
Total		**2**	**2**	**7**	**10**	**10**	**6**

2.5. Lab Topics:

N.A

2.6 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						

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	4,7,10,12,13	5 %
Quiz	5,9,11	3 %
Discussion	12	2%
Mid-term exam	8	30 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. 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.
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:	

2.9. 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	
	CO1	CO2
PO2	√	
PO6		√

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	PO2	CLO1	• Lecture. • Tutorials.	• Mid-Term Exam • Final Exam. • Assignments.
		CLO2	• Lecture. • Tutorials.	• Mid-Term Exam • Final Exam. • Assignments.
PLO12	PO6	CLO3	• Lecture • Tutorials. • Report	• Mid-Term Exam • Final Exam. • Quiz • Assignments. • Discussion
		CLO4	• Lecture • Tutorials. • Report	• Mid-Term Exam • Final Exam. • Quiz • Assignments. • Discussion
PLO4		CLO5	• Lecture • Tutorials. • Report	• Mid-Term Exam • Final Exam. • Quiz • Assignments. • Discussion
		CLO6	• Lecture. • Tutorials.	• Mid-Term Exam • Final Exam. • Quiz • Assignments.

Course Coordinator: Assoc. Prof. Nader Nabih Khalil

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering				
Department Offering the course	Civil Engineering				
Date of Specification Approval	10/9/2024				
Course Title	Highway Engineering			**Code**	C1382
Type	Compulsory ☒		Elective ☐		
Semester	2nd Semester				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	1	1	5	

2. Professional Information:

2.1. Course description:

Geometric design:

Road classification - planning and road selection - Geometric design criteria Sight distance - Horizontal alignment - Vertical alignment - Cross section elements - Planning and design of at grade intersections design - Roundabout and interchange design.

Structural design:

Pavement types and components - Subgrade soil classification -Subgrade soil Strength- Soil stabilization - Stresses in flexible pavement - Stresses in rigid pavement -Traffic loads considerations - Flexible pavement design- Rigid pavement design.

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 situation.	**CO1**	Evaluate soil strength
PO 4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO 2**	Choose the road dimensions and Calculate sigh distance.
PO 6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO 3**	Design the alignment and the thickness of highway.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO 4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO1**	Choose the road dimensions with respect to road and area classification according to Egyptian Code.
		CLO2	Calculate sigh distance as a road safety requirement for geometric design
PLO 2	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**	Evaluate soil characteristics.
PLO 12	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 different elements of highway (vertical alignment, horizontal alignment, and intersections)
		CLO4	Classify soil for highway construction.
		CLO6	Apply practice research techniques to perform soil stabilization.
		CLO7	Calculate Equivalent Single Axle Loads (ESAL) for designing the pavement.
		CLO8	Calculate the pavements of highway.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO 8**
Road classification – Planning	**1**	√							
Sight distance	**2**		√						
Vertical alignment	**3**			√					
Horizontal alignment	**4**			√					
Planning and design of at grade intersections	**5**		√	√				√	

Roundabout and interchange design	**6**	√		√					
Pavement types and components - Subgrade soil classification	**7**				√				
Midterm Exam	**8**								
Subgrade soil strength	**9**					√			
Stresses in pavement	**10**						√		
Soil stabilization	**11**					√	√		
Traffic loads considerations	**12**							√	
Pavement design	**13,14**				√				√
Practical and Oral Exam	**15**								
Final Exam	**16**								
Total		**2**	**2**	**4**	**3**	**2**	**2**	**2**	**2**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Subgrade soil strength	**9,10**					√			
Total						**2**			

2.6 Teaching and Learning Methods

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

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Formative Assessment Method									
Tests	Midterm Exam	√	√	√					
	Experimental Test					√			
	Oral Test					√			
Assignments		√	√	√	√		√		
Mini Projects								√	√
Summative Assessment Method									
Final Exam			√	√	√		√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Assignments	1-7, 11	5
Mini Projects	14	5
Midterm Exam	8	15
Experimental Test	15	15
Oral Test	15	10
Final Exam	16 and after	75
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to 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.
Recommended Books:	Egyptian Codes for Highways.
Periodicals, Web Sites, … etc:	https://www.mot.gov.eg/#/ https://highways.dot.gov/

2.9. 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		
	CO 1	CO 2	CO 3
PO 1	√		
PO 4		√	
PO 6			√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes							
	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5	CLO 6	CLO 7	CLO 8
CO 1					√			
CO 2	√	√						
CO 3			√	√		√	√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes							
	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5	CLO 6	CLO 7	CLO 8
PLO 2					√			
PLO 4	√	√						
PLO 12			√	√		√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	**PO1**	**CLO5**	• Practical-based Learning	• Experimental Test • Oral Test
PLO4	**PO4**	**CLO1**	• Lecture • Tutorials	• Midterm Exam • Assignments
		CLO2	• Lecture • Tutorials	• Midterm Exam • Assignments • Final Exam
PLO12	**PO6**	**CLO3**	• Lecture • Tutorials	• Midterm Exam • Assignments • Final Exam
		CLO4	• Lecture • Tutorials	• Assignments • Final Exam
		CLO6	• Lecture • Tutorials	• Assignments • Final Exam
		CLO7	• Lecture • Project-based Learning	• Mini Projects • Final Exam
		CLO8	• Lecture • Project-based Learning	• Mini Projects • Final Exam

Course Coordinator: Dr Ahmed Gamal M. Morsi

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	10/9/2024			
Course Title	Irrigation & Drainage Engineering		**Code**	**C 1342**
Type	**Compulsory** ☒		**Elective** ☐	
Semester	**2nd Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	1	6

2. Professional Information:

2.1. Course description:

Introduction - Methods of Irrigation and drainage – Alignment and design of canals and drains – Sprinkler irrigation system - Drip irrigation system - Canals lining - Ground water - Reclamation of soil.

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.	**CO 1**	Use different water resources, Egyptian irrigation networks, the rotation irrigation system, the traditional irrigation, system and the modern irrigation systems
PO 6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural, and societal considerations.	**CO 2**	Evaluate the sprinkler irrigation system, drip irrigation system and well systems .

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO 1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic	**CLO 1**	Identify different water resources of Nile River basin and different methods of irrigation in Egypt.

	science, and mathematics.	**CLO 2**	Apply the modern irrigation systems.
PLO 12	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.	**CLO 3**	Design of canals, drains and different types of sprinkler and drip irrigation networks
		CLO 4	Design of canal lining and well system for ground water

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction	1	√			
Methods of Irrigation and drainage	2	√			
Water resources of Nile River basin	3	√			
History of irrigation and irrigation structures in Egypt	4	√			
Alignment of canals and drains	5		√	√	
design of canals and drains	6		√	√	
Synoptic diagram	7		√	√	
Mid term	8				
modern irrigation system	9		√	√	
Design of sprinkler irrigation network	10		√	√	
Design of Drip irrigation network	11		√	√	
Canals lining	12				√
Ground water and design of wells	13				√
Reclamation of soil	14				√
Practical and Oral Exam	15				
Final Exam	16				
Total		**4**	**6**	**6**	**3**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Flow over weir	4			√	√
Flow through gate	9			√	√
Total				**2**	**2**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lectures	√	√	√	√
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Oral Test			√	√
	Midterm Exam	√	√	√	√
Assignments		√	√	√	√
Report				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm exam	8	15%
Report	6 - 10	10 %
Assignments	3,9 , 12	5 %
Oral exam	15	10 %
Final exam	16 and above	60 %
Total		

2.8. List of Reference:

Essential Books (Textbooks):	Irrigation Engineering by Reddy 2018 ISBN 81-89729-98-5

2.9. 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	
	CO 1	CO 2
PO1	√	
PO 6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
PLO 1	√	√		
PLO 12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 1	PO 1	CLO 1	• Lecture • Tutorial	• Written Exam • Report
		CLO 2	• Lecture • Tutorial	• Written Exam • Assignment
PLO 12	PO 6	CLO 3	• Lecture • Tutorial • Report	• Written Exam • Assignment • Oral Test • Report
		CLO 4	• Lecture • Tutorial • Report	• Written Exam • Assignment • Oral Test • Report

Course Coordinator: Dr. Ahmed Abouelfettoh

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering				
Department Offering the course	Civil Engineering				
Date of Specification Approval	**10/9/2024**				
Course Title	**Water Supply Engineering**			**Code**	**C 1392**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**Second Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**1**	**6**	

2. Professional Information:

2.1. Course description:

Water Supply Engineering: Sources of water (surface and ground) - Water characteristics - Estimation of water consumption in the future - Design of water intakes - Sedimentation - Coagulation and Flocculation - Filtration - Disinfection - Storage - Water distribution system.

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**	Illustrate the sources of water, water characteristics and collection works which used as concept for water treatment.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations	**CO2**	Design the different units of WTPand water distribution system.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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 the different data about water characteristics, future population and water consumption
		CLO2	Discuss the different data about collection works .
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 of different water treatment unites (Sedimentation, Filtration and Storage tank)
		CLO4	Plane the water distribution system.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Population Projection	**1**	√			
Water Consumption	**2**	√	√		
Water Quality	**3**	√			
	4	√			
Collection Works for Surface Water	**5**		√		
Sedimentation	**6**			√	
Coagulation and Flocculation	**7**			√	
Mid-Term Exam	**8**				
Filtration	**9**			√	
Disinfection	**10**			√	
Storage (Water Tanks)	**11**			√	
Water Distribution	**12**				√
Water Distribution	**13**				√
Water Distribution	**14**				√
Practical exam	**15**				
Final Exam	**16**				
Total		**4**	**2**	**5**	**3**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Turbidity, PH, Temperature, Total Dissolved Solids (TDS), Total Suspended Solids (TSS) andVolatile Solids (VS)	**9**	√			
Chloride, Iron and Manganese, Arsenic, Fluorides and total bacteria account	**10**	√			
Jar test	**11,12**		√		
Total		**2**	**2**		

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. Practical-based 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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Quizzes			√	√
	Midterm Exam	√	√	√	
	Experimental Test	√		√	
Mini Projects					√
Assignments		√	√		√
Summative Assessment Method					
Final Exam		√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 , 9 - 13	5 %
Midterm exam	8	10 %
Mini Projects	7	2.5 %
Quizzes	3.,5,7,10,13	2.5 %
Experimental	15	20 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Essential Books (Textbooks):	• Water and Wastewater Technology: Pearson New International Edition ISBN-13: 9781292021041 • Water supply, prof. Dr. M. Basiouny (2019) • شبكات المياه - الكود المصرى (2019) • محطات تنقية مياه الشرب - الكود المصرى- (2019)

2.9. 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	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO2	√	√		
PLO12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment
PLO2	PO1	CLO1	• Discussion • Practical-based Learning	• Written Exam • Assignments • Experimental Test
		CLO2	• Discussion • Practical-based Learning	• Written Exam • Assignments • Experimental Test
PLO12	PO6	CLO3	• Lecture • Tutorials • Project-based Learning	• Written Exam • Quiz • Assignments • Mini-Project
		CLO4	• Lecture • Tutorials • Project-based Learning	• Final Exam • Assignments • Quiz • Mini Projects

Course Coordinator: Dr. Osama Abdelaziz Abosiada

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering				
Department Offering the course	Civil Engineering				
Date of Specification Approval	**10/9/2024**				
Course Title	Pollution and Environment			**Code**	**C 1304**
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**Second Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	1	**1**		**2**	

2. Professional Information:

2.1. Course description:

Pollution and Environment: Philosophy of Environmental Controls - Introduction to National and International Regulatory Structures - Emissions Control - Environmental Impact Assessment - Ecological Sanitation - Nature and Sources of Air Pollution (Chemical and Biological Aspects, Effects on Health and Environment) - Air Pollution Control and Reduction.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	Apply the Philosophy of Environmental Controls, Emissions Control, Environmental Impact Assessment, Air Pollution, water pollution
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Illustrate different pollutants for environmental (Soil pollution, noise pollution and solid waste management) with appropriate attention to health and safety risks.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety	**CLO1**	Discuss the national and international regulatory related to environment pollution .

	requirements, environmental issues, and risk management principles.	**CLO2**	Explain nature and sources of air pollution and ways for control and reduction.
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 water pollution,
		CLO4	Describe nature and sources of water pollution, Soil pollution, noise pollution, solid waste management and ways for control and reduction.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Philosophy of environmental controls	**1,2**	√			
Emissions control and environmental impact assessment	**3,4**	√	√		
Nature and sources of air pollution and air pollution control and reduction	**5,6**		√		
water pollution and ecological sanitation	**7**			√	
Mid-Term Exam	**8**				
noise pollution	**9**				√
	10				√
Soil pollution	**11,12**				√
Solid wastes management	**13,14**				√
Practical Exam	**15**				
Final Exam	**16**				
Total		**3**	**3**	**1**	**7**

2.5 Lab Topics:

NA

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2		CLO4
Formative Assessment Method					
Tests	Quizzes	√	√		√
	Midterm Exam	√	√		
Assignments		√	√		√
Summative Assessment Method					
Final Exam		√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 , 9 - 13	10 %
Midterm exam	8	20 %
Quizzes	3,5,7,9 - 13	10 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	Not used
Essential Books (Textbooks):	• Peavy, Rowe and Tchobangolous " Environmental Engineering" McGraw Hill • Jeremy Colls, “Air Pollution”, second edition, by Spon Press 2002 • Prof. M. Bassuieny, “Pollution and Environment “ (2019)

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	
	CO1	CO2
PO4	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO4	√	√		
PLO13			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO4	PO4	CLO1	• Lecture • Tutorials	• Written Exam • Assignments • Quiz
		CLO2	• Lecture • Tutorials	• Written Exam • Assignments • Quiz
PLO13	PO6	CLO3	• Lecture • Tutorials	• Written Exam • Assignments • Quiz
		CLO4	• Lecture • Tutorials	• Written Exam • Assignments • Quiz

Course Coordinator: Dr. Osama Abdelaziz Abosiada

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

مقررات الفرقة الرابعة

Fourth Year

مقررات الفرقة الرابعة

Fourth Year - 1

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering			
Department Offering the Course	Civil Engineering			
Date of Specification Approval	10/9/2024			
Course Title	Design of irrigation works		**Code**	C 1441
Type	Compulsory ☒	Elective ☐		
Semester	First Semester (Fourth Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	4	2	0	6

2. Professional Information:

2.1. Course description:

Basic concept of irrigation structures design -Design of culverts - Design of syphon - Design of aqueducts - Design of retaining walls - Design of tail escapes - Design of bridges - Design of weirs -Heading up structure - Head regulator design -Types of dams - Navigation structures (locks).

2.2. Course Objectives (CO):

Program objective		Course objective	
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO1**	Create Classification of irrigation structures.
		CO2	Evaluate the Crossing structures: Small R.C. bridges, Culverts, Syphons, Aqueducts. Escapes: Types, Functions, Design.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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	**CLO1**	Design the irrigation works as the tail escape, culvert, syphon, retaining wall, regulator, and bridges.
		CLO2	Design the Navigation works as (locks).

	discipline.		
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**	Determine the heading up of the irrigation works.
		CLO4	Classify the different cases of loading for irrigation structure.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Introduction	1	√		√	√
Design of Tail escape	2	√			√
Design of Box Culvert	3,4	√			√
Design of Pipe Culvert	5	√			
Design of Box Syphon	6	√			√
Design of Pipe Syphon	7	√			
Midterm Exam	8				
Design of Box aqueduct	9	√			√
Design of Pipe aqueduct	10	√			
Design of Bridges	11	√			√
Design of Retaining Walls	12	√			√
Design of Regulators	13	√	√	√	
Design of Navigation structures	14		√	√	
Practical Exam	15	Not Applicable			
Final Exam	16				
Total		12	2	3	7

2.5. Lab Topics:
N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lectures	√	√	√	√
2. Tutorials	√	√	√	√
3. Reports			√	
3. Project-based 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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Oral Test	√		√	√
	Midterm Exam	√			√
	Quizzes	√	√	√	√
Mini projects		√			√
Reports				√	
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quizzes	6,11	4%
Midterm Exam	8	20%
Reports	14	4%
Mini Project	15	4%
Oral Test	15	8%
Final Exam	16 and above	60%
Total		100%

2.8. List of Reference:

Course Notes:	
Recommended Books:	Irrigation and Drainage Principle (Dr. Sharl Irrigation Engineering and Hydraulic Structures by Santosh Kuma- By Easy Engineering, 2012
Periodicals, Web Sites, … etc:	-

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	
	CO1	CO2
PO6	√	√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO12	√	√		
PLO13			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO12	PO6	CLO1	• Lecture • Tutorials • Project-based Learning	• Midterm Exam • Final Exam • Quizzes • Mini projects • Oral Test
		CLO2	• Lecture • Tutorials	• Final Exam • Quizzes
PLO13		CLO3	• Lecture • Tutorials • Reports	• Final Exam • Quizzes • Reports • Oral Test
		CLO4	• Lecture • Tutorials • Project-based Learning	• Midterm Exam • Final Exam • Quizzes • Mini projects • Oral Test

Course Coordinator: Dr. Ahmed Abou Elfetoh

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering program			
Department Offering the Program	Civil Engineering			
Department Offering the Course	Civil Engineering			
Date of Specification Approval	10/9/2024			
Course Title	Design of Concrete Structures (3)		**Code**	C 1451
Type	Compulsory ☒	Elective ☐		
Semester	First Semester (Fourth Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	0	5

2. Professional Information:

2.1. Course description:

Design of Concrete Structures (3): Working stresses design method - Design of water structures (Circular tank - Rectangular tanks - Underground tanks - Elevated tanks - Wide tanks) - Design of shell structures (domes - cones).

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Behave professionally and adhere to engineering ethics and standards.
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO2**	Use techniques, skills and modern engineering tools for reinforced concrete structures.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO3**	Design the Concrete Structures geometrically & structure

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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.
		CLO2	**Apply** the Principals of designing to the water-structural elements**.**
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO3**	**Utilize** Egyptian codes for reinforced concrete structures.
		CLO4	**Use** different structural systems for planning the RC buildings.
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**	**Analyze** the different RC structure elements.
		CLO6	**Design** the different reinforcement concrete structural elements according to ECP.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Working stresses design method	**1**	√					
Control of cracking	**2**	√					
Design of elevated rectangular water tanks	**3,4**		√	√			√
Design of Wide tanks	**5,6**		√	√			√
Design of tower tank under wind load	**7**			√			√
Midterm Exam	**8**						
Rested on soil &underground RC water tanks	**9**		√		√	√	
Design of Circular R.C. Water Tanks	**10,11**		√		√	√	√

Evaluate Types of R.C. water structures	**12**		√		√	√	
Design of R.C shell structures (domes - cones)	**13,14**	√		√	√	√	√
Practical Exam	**15**						
Final Exam	**16**						
Total		**4**	**8**	**7**	**6**	**6**	**9**

2.5. Lab Topics:

N.A

2.6 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	√	√			√	√
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**					
Methods		**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	Oral Test		√			√	
	Midterm Exam	√	√	√			√
Assignments		√	√	√	√	√	√
Mini Project		√	√			√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	**Week**	**Weighting of Asses.**
Assignments	2 - 6 , 9 , 13	6 %
Mini Project	14	8 %
Midterm Exam	8	20 %
Oral Exam	15	6 %
Final Exam	16 and above	60 %
Total		**100 %**

2.9. List of Reference:

Course Notes:	Not used
Essential Books (Textbooks):	• Shaker elbehary handbook. • ECP203-2020. • Design of RC Structure halls – DR.M. Hilal. • Lectures.
Recommended Books:	• Design of RC Structure - DR. Mashhour A. Ghoneim.

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	CO3
PO2	√		
PO4		√	
PO6			√

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

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	PO2	CLO1	• Lecture • Tutorials • Project-based Learning	• Midterm Exam • Final Exam • Assignments • Mini Project
		CLO2	• Lecture • Tutorials • Project-based Learning	• Midterm Exam • Final Exam • Assignments • Mini Project • Oral Test
PLO4	PO4	CLO3	• Lecture • Tutorials	• Midterm Exam • Final Exam • Assignments
		CLO4	• Lecture • Tutorials	• Final Exam • Assignments
PLO12	PO6	CLO5	• Lecture • Tutorials • Project-based Learning	• Final Exam • Assignments • Mini Project • Oral Test
		CLO6	• Lecture • Tutorials • Project-based Learning	• Midterm Exam • Final Exam • Assignments • Mini Project

Course Coordinator: Dr. Marwa Hany Bondok.

Head of Department: Prof. Dr. Hala Refat Da[illegible]

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	**Civil Engineering Program**				
Department Offering the Program	**Civil Engineering**				
Department Offering the Course	**Civil Engineering**				
Date of Specification Approval	**10/9/2024**				
Course Title	Design of Foundations (a)			**Code**	C1461
Type	**Compulsory** ☒		**Elective** ☐		
Semester	**First Semester (Fourth Year)**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	2	-	5	

2. Professional Information:

2.1. Course Description:

Bearing capacity - Shallow foundation (Construction considerations - Design considerations) - Design of shallow foundation (Isolated footings - Strip footings - Combined footings - Strap beam footings - Rafts) - Deep foundations (Construction considerations - Design considerations).

2.2. Course Objectives (CO):

Program objective		Course objective	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Apply the principles of soil bearing capacity and choose an appropriate type of foundation that is appropriate to safety standards considering economic and societal factors.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Design the different types of shallow foundations taking into consideration the safety risks, applicable standards, and economics.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic,	**CLO1**	Calculate the bearing capacity of soil for the shallow foundation.

	environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**CLO2**	Explain the construction and design considerations for shallow and deep foundations to produce cost-effective solutions.
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 of combined footings and strap footings and rafts

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Bearing capacity of soil	**1**	√			
Bearing capacity of soil	**2**	√			
Bearing capacity of soil	**3**	√			
Shallow foundation (Construction & Design considerations)	**4**		√		
Design of isolated footings	**5**			√	
Design of isolated footings subjected to eccentric force	**6**			√	
Design of strip footings	**7**			√	
Midterm Exam	**8**				
Design of combined footings (Rect.)	**9**				√
Design of combined footings (Trap.)	**10**				√
Design of strap foundations	**11**				√
Design of raft foundations	**12**				√
Design of raft foundations	**13**				√
Deep foundations (Construction & Design considerations)	**14**		√		
Practical exam	**15**				
Final Exam	**16**				
Total		**3**	**2**	**3**	**5**

2.5. Lab Topics:

N.A

2.6 Teaching and Learning Methods:

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
Lecture	√	√	√	√
Tutorials	√	√	√	√
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				

2.7 Assessment Methods:

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Midterm Exam	√	√	√	
	Quizzes	√		√	√
Mini Projects				√	√
Assignments		√	√	√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution:

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 , 9 - 13	5 %
Midterm exam	8	20 %
Mini Projects	12,13	5 %
Quizzes	4 ,7,11	10 %
Final exam	16 and above	60%
Total		

2.8. 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. • Hemed a, Advances in Soil Mechanics and Foundation Engineering, IntechOpen, London ISBN: 978-1-78984-290-6,2020

Recommended Books:	• Bowles, J., Foundation Analysis and Design, McGraw - Hill, 5th. Ed., ISBN 978 – 007 - 912 – 247 – 7, 2009.

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
PO2	√	
PO6		√

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:

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO3	√	√		
PLO12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO3	PO2	CLO1	• Lecture • Tutorials	• Midterm Exam • Quiz • Assignment • Final Exam
		CLO2	• Lecture • Tutorials	• Midterm Exam • Assignment • Final Exam
PLO12	PO6	CLO3	• Lecture • Tutorials • Project-based Learning	• Midterm Exam • Quiz • Assignment • Final Exam • Mini Project
		CLO4	• Lecture • Tutorials • Project-based Learning	• Quiz • Final Exam • Assignment • Mini Project

Course Coordinator: Dr. Mohab Roshdy Ahmed 

Head of Department: Prof. Dr. Hala Refat 

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering			
Department Offering the Course	Civil Engineering			
Date of Specification Approval	10/9/2024			
Course Title	Highway and Airport Engineering		**Code**	C 1481
Type	Compulsory ☒	Elective ☐		
Semester	First Semester (Fourth Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	1	6

2. Professional Information:

2.1. Course description:

Airport Engineering: Airport planning and component - Aircraft characteristics related to airport design - Airport classification – Airport configuration - Runway orientation – Airport obstruction clearance surfaces - Airport capacity - Geometric design of the airport (runway, taxiway, exit taxiway - and apron) - Heliports landing strip - Structural design of airports - Airport lighting, marking, and sings - Drainage.
Highway Engineering: Testing and specifications of road aggregates - Testing and specifications of bituminous materials characteristics and tests – Hot mix asphalt concrete characteristics and design -Asphalt concrete mix planet - Pavement layers construction - Pavement maintenance - Drainage.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO1**	Plan and design the airport system
		CO2	Construct and maintain pavement layers

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least	**CLO1**	Describe aircraft characteristics related to airport design
		CLO2	Analyze the wind rose
		CLO3	Plan the different elements of the

	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.		airport (Apron, Taxiway, Runway, Exits,…etc) According to ICAO
		CLO4	Design the pavement of the airport according to FAA specification
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.	**CLO5**	Test the road materials
		CLO6	Design asphalt concrete mixture
		CLO7	Construct the pavement layers According to Egyptian code.
		CLO8	Evaluate the pavement distresses According to Egyptian code.

2.4. Course Topics:

Course Topics	**Week**	**Course LOs Covered**							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Airport planning , component and characteristics .	**1**	√	√						
Airport classification and configuration	**2**	√	√						
Geometric design of the airport and its capacity.	**3-5**			√					
Airport obstruction clearance surfaces	**6**			√					
Structural design of airports	**7**				√				
Midterm exam	**8**								
Airport lighting, marking, and sings	**9**				√				
Testing and specifications of road aggregates	**10**					√			
Hot mix asphalt concrete characteristics and design	**11**					√	√		
Asphalt concrete mix planet	**12**					√	√		
Pavement layers construction and maintenance	**13,14**							√	√
Practical exam	**15**								
Final Exam	**16**								
Total		**2**	**2**	**4**	**2**	**3**	**2**	**2**	**2**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered							
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Penetration test, Softening point test	10					√			
Flash point test, thin film oven test	11					√			
Extraction test and compaction percent	12					√			
Total	**3**					**3**			

2.6 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. Project-based Learning			√	√				
4. 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								

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered							
Methods		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Formative Assessment Method									
Tests	Oral Test					√			
	Midterm Exam	√	√	√	√				
	Experimental					√			
Mini Projects				√	√				
Assignments		√	√				√	√	√
Summative Assessment Method									
Final Exam		√	√	√	√		√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 7 , 13 - 14	2 %
Midterm exam	8	16 %
Mini Projects	9	2 %
Oral & Experimental	15	20 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Essential Books (Textbooks):	• Pavement Engineering Principles and Practice, Rajib B. Mallick and Tahar El-Korchi, CRC Press Taylor & Francis Group, Third Edition, 2018, ISBN-13: 978-1-4987-5880-2. • Airport Design and Operation, ANTONI´N KAZDA & ROBERT E. CAVES, Emerald Group Publishing Limited, Third Edition, 2015, ISBN: 978-1-78441-870-0.
Recommended Books:	• Planning and Design of Airports, Robert Horonjeff, Francis X. McKelvey, William J. Sproule, and Seth B. Young, Fifth Edition, Mc Graw Hill, 2010, ISBN-13: 978- 0071446419. • Pavement Analysis and Design, Yang Huang, Second International Edition, Pearson, 2012, ISBN-13: 978-0-13-272610-8.
Periodicals, Web Sites, … etc:	**https://www.faa.gov/** **https://www.icao.int/Pages/default.aspx**

2.9. 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
PO6	√	√

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

Program Learning Outcomes	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
PLO12	√	√	√	√				
PLO13					√	√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO12	PO6	CLO1	• Lectures • Tutorials	• Assignment • Midterm Exam • Final Exam
		CLO2	• Lectures • Tutorials	• Assignment • Midterm Exam • Final Exam
		CLO3	• Lectures • Tutorials • Project-based Learning	• Midterm Exam • Mini Project • Final Exam
		CLO4	• Lectures • Tutorials • Project-based Learning	• Midterm Exam • Mini Project • Final Exam
PLO13		CLO5	• Practical-based Learning	• Experimental Test • Oral Test
		CLO6	• Lectures • Tutorials	• Assignment • Final Exam
		CLO7	• Lectures • Tutorials	• Assignment • Final Exam
		CLO8	• Lectures • Tutorials	• Assignments • Final Exam

Course Coordinator: Dr. Ahmed Gamal

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering			
Department Offering the Course	Civil Engineering			
Date of Specification Approval	10/9/2024			
Course Title	Sewerage		**Code**	C 1491
Type	Compulsory ☒	Elective ☐		
Semester	First Semester (Fourth Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	1	6

2. Professional Information:

2.1. Course description:

Sewerage: Sources, types and characteristics of municipal wastewater - Municipal wastewater collection and transportation - Preliminary treatment of municipal Wastewater (Deceleration chamber - Screen and Gritchamber) - Primary treatment of municipal wastewater - Secondary treatment of municipal wastewater (Oxidation pond - Activated sludge process - Trickling filter process - Rotating biological contactor - Aerated lagoon) - Sludge disposal (Thickening - Stabilization - Dewatering).

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**	Illustrate the sources, characteristics of municipal wastewater and Wastewater gravity system.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations	**CO2**	Design the different units of WWTP

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate	**CLO1**	Discuss the different sources of wastewater and wastewater characteristics.

	findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**CLO2**	Analyze the sewer system and Preliminary treatment of municipal Wastewater
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 different methods of Secondary treatment of municipal wastewater (Oxidation pond - Activated sludge process - Trickling filter process - Rotating biological contactor - Aerated lagoon)
		CLO4	Use the different methods of Sludge treatment and disposal (Thickening - Stabilization - Dewatering).

2.4. Course Topics:

Course Topics	Week	Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Wastewater concept and its sources	**1**	√			
Characteristics of wastewater	**2**	√			
Characteristics of wastewater	**3**	√			
Sewer system design	**4**		√		
Sewer system design	**5**		√		
Primary treatment	**6**		√		
Oxidation ponds	**7**			√	
Midterm Exam	**8**				
Trickling filter	**9**			√	
Rotating biological contactor	**10**			√	
Activated sludge	**11**			√	
Aerated lagoons	**12**			√	
Sludge treatment	**13**				√
Sludge treatment	**14**				√
Practical Exam	**15**				
Final Exam	**16**				
Total		**3**	**3**	**6**	**2**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
PH, Temperature, Total Solids (TS), Chloride, Nitrogen, Phosphorus, Heavy Metals, Dissolved Oxygen (DO), total bacteria account and Total coliform.	**9**	√	√		

Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD)	**10**	√	√		
Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD).	**11**	√	√		
Total	**3**				

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. Practical-based 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				

2.7 Assessment Methods

Assessment Methods:		**Course LOs Covered**			
		CLO1	**CLO2**		**CLO4**
Formative Assessment Method					
Tests	Quizzes				√
	Midterm Exam	√	√		
	Experimental	√			
Mini Projects			√		√
Assignments		√	√	√	√
Summative Assessment Method					
Final Exam		√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	**Week**	**Weighting of Asses.**
Assignments	2 - 6 , 9 - 13	5 %
Midterm exam	8	10 %
Mini Projects	7	2.5 %
Quizzes	3.,5,7,10,13	2.5 %
Experimental	15	20 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	Not used
Essential Books (Textbooks):	• Metcalf & Eddy l AECOM (2014) Wastewater Engineering, Treatment and Resource Recovery, ISBN 978-0-07-340118-8 • Sewerage Prof. Dr. M. Basiouny (2019) • محطات الرفع - الصرف الصحى- الكود المصرى (2019) - • أعمال المعالجة- الصرف الصحى - الكود المصرى-(2019)

2.9. 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	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO2	√	√		
PLO12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment
PLO2	PO1	CLO1	• Practical-based Learning • Discussion	• Experimental • Midterm Exam • Assignments • Final Exam
		CLO2	• Discussion	• Midterm Exam • Mini Projects • Assignments • Final Exam
PLO12	PO6	CLO3	• Lecture • Tutorials	• Quizzes • Midterm Exam • Assignments • Final Exam
		CLO4	• Lecture • Tutorials • Project-based Learning	• Quizzes • Assignments • Final Exam • Mini Projects

Course Coordinator: Dr. Osama Abdelaziz Abosiada

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Field Training			Code	C1400
Type	Compulsory ☒		Elective ☐		
Semester	Summer Term After Third Year				
Teaching Hours	Lec.	Tut.	Practical	Contact hours	
	0	0	2	2	

2. Professional Information:

2.1. Course description:

The student should carry out field training in some construction project for a period of six weeks during the summer vacation. A report is to be submitted and discussed at the end of summer vacation.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO 3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO 1**	Plan the construction process well by acquiring and applying new practical knowledge and working in homogeneous teamwork
PO 5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO 2**	Format technical report explaining all the stages of the training field and all gained information.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO 6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO1**	Explain the different stages of construction process which is monitored during the time of field training. - Create
PLO 7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**CLO2**	Practice working in teamwork in the field training with students from other disciplines. - Apply

PLO 9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO3**	Acquire new practical skills that make him accustomed to innovative thinking for problem solving and making practical decisions with confidence. - Apply
PLO 10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	**CLO4**	Explain all practical knowledge that gained through the time of field training. - Evaluate
PLO 5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO5**	Prepare an engineering technical report dealing with all practical knowledge that is obtained in the time of field training. - Create

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
The student will be trained in the field, this gives the opportunity to supervise the construction work closely within six weeks. The students will gain practical experience in their field of studies through working in public or private companies. In this interval the student will practice the different stages of construction process according to the available civil project type.	1:6	√	√	√		
By the end of field training	7 and above				√	√
Oral Exam	At the end of summer vacation					
Total						

2.5. Lab Topics:

Field training for 6 weeks

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Practical-based Learning	√	√	√		
Self-Learning				√	√
Report		√	√	√	√
Teaching and Learning Methods for Students with Special Needs:					
Methods					

Discussion Session
Extra Video Lectures
Provide different levels of books and materials

2.7 Assessment Methods

Assessment Methods:	Course LOs Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method					
Report		√	√	√	√
Presentation		√	√	√	√
Summative Assessment Method					
Oral Exam	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Report		20
Presentation		20
Oral Exam	At the end of summer vacation	60
Total		100 %

2.8. List of Reference:

Essential Books (Textbooks):	-Encyclopedia El-Bakary, March 2022.

2.9. Facilities required for Teaching and Learning

Different Facilities
Field construction site

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO 3	√	
PO 5		√

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

Program Learning Outcomes	Course Learning Outcomes				
	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
PLO 6	√				
PLO 7		√			
PLO 9			√		
PLO 10				√	
PLO 5					√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 6	PO3	PLO 1	• Practical-based Learning	• Oral Exam
PLO 7		PLO 2	• Practical-based Learning • Report	• Oral Exam • Report • Presentation
PLO 9		PLO 3	• Practical-based Learning • Report	• Oral Exam • Report • Presentation
PLO 10	PO5	PLO 4	• Self-Learning • Report	• Report • Oral Exam • Presentation
PLO 5		PLO 5	• Self-Learning • Report	• Report • Oral Exam • Presentation

Course Coordinator: Dr Ahmed Gamal M. Morsi

Head of Department: Prof. Dr. Hala Refat

Date: ١٠/ 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering				
Department Offering the Course	Civil Engineering				
Date of Specification Approval	10/9/2024				
Course Title	Legislations and Contracts			**Code**	U 1401
Type	Compulsory ☒		Elective ☐		
Semester	First Semester (Fourth Year)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	2	0	0	2	

2. Professional Information:

2.1. Course description:

Legislations and Contracts: Define contract documents, define priority of contract documents, regulations, construction law Plan and manage construction documents, deal with biddings and financial issues including project insurances, disputes.

Acquire knowledge and understanding the ability to prepare and analyse the bill of quantities for any specified project. The preparation and calculation of the on-going works quantities the ability to manage construction project.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO6	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills	**CO1**	Analyze project insurances, bid, claims, disputes, and financial concerns.
PO7	Incorporate economics and business practices including project risk and change management into the practice of engineering and to understand their limitations.	**CO2**	Create and analyze the bill of quantities for any given project by acquiring the knowledge and understanding necessary.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO13	Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials;	**CLO1**	Analyze contract documents during project life cycle,
		CLO2	Discuss the construction documents in biddings and financial issues

	and assess environmental impacts of projects.		
PLO14	Deal with biddings, contracts and financial issues including project insurance and guarantees	**CLO3**	Describe the assessment of the administration process of contract and estimation
		CLO4	Select how to improve the risk mitigation process during tendering.

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Define contract documents	**1**	√			
define priority of contract documents	**2**	√			
construction law Plan	**3**	√			
manage construction documents	**4**		√		
deal with biddings and financial issues	**5**		√		
project insurances, disputes.	**6**		√		
Responsibilities of the different project parties	**7**		√		
Midterm Exam	**8**				
Prepare the bill of quantities	**9**			√	
Analyse the bill of quantities	**10**			√	
Estimation of Construction Duration	**11**			√	
Creation of Construction Time Plan	**12**			√	
The preparation and calculation of the on-going works quantities	**13**				√
The ability to manage construction project.	**14**				√
Practical Exam	**15**	**Not Applicable**			
Final Exam	**16**				
Total		**3**	**4**	**4**	**2**

2.5. Lab Topics:
N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**			
	CLO1	**CLO2**	**CLO3**	**CLO4**
1. Lecture	√	√	√	√
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
Summative Assessment Method				
Final Exam	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Final exam	**16**	**100 %**
Total		**100 %**

2.8. List of Reference: (max. five years ago)

Course Notes:	Not used
Essential Books (Textbooks):	- Fidic contracts forms 2017 red book edition - law no 89 issue year 1998, civil law - law no 82/2018, civil law
Recommended Books:	- Hinze, J. (1993). *Construction contracts* (pp. 1-2). New York: McGraw-Hill.
Periodicals, Web Sites, … etc:	- **https://www.law.cornell.edu/wex/contract** - **https://www.britannica.com/topic/contract-law** - **https://ironcladapp.com/journal/contracts/what-is-a-contract/**

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	
	CO1	CO2
PO6	√	
PO7		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO13	√	√		
PLO14			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO13	PO6	CLO1	Lecture	Final Exam
		CLO2	Lecture	Final Exam
PLO14	PO7	CLO3	Lecture	Final Exam
		CLO4	Lecture	Final Exam

Course Coordinator: Ass.Prof.: Ahmed Nouh Meshref Ahmed Nouh

Head of Department: Prof. Dr. Hala Refat Dat

10 / 9 /2024

مقررات الفرقة الرابعة

Fourth Year - 2

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the Program	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Engineering Economy			**Code**	C 1408
Type	Compulsory ☒		Elective ☐		
Semester	Second Semester (Fourth Year)				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	1	1	0	2	

2. Professional Information:

2.1. Course description:

Basic concept of engineering economics – Cash flow – Compound interest formula – Time value of mony – Nominal and effective interest – Equivalence – Present worth value – Benefit/Cost ratio – Annual cost – Rate of return – Economics analysis of engineering alternative - Depteciation – Income taxes.

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 economic problems involving comparison and selection of alternatives by using analytical techniques and entrepreneurial skills.
PO7	Incorporate economics and business practices including project risk and change management into the practice of engineering and to understand their limitations.	**CO2**	Illustrate the major principles of economic analysis for decision making among alternative courses of action in engineering.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO14	Deal with biddings, contracts and financial issues including project insuranceand guarantees.	**CLO1**	Discuss the basic concepts and terminology used in engineering economics.
		CLO2	Use the concepts of cash flows, time value of money in evaluation of investments and projects in real life

PLO9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO3**	Evaluate the alternatives based on present, annual, rate of return, and benefit over cost analyses
		CLO4	Identify the impact of depreciation, taxation and other economic factors on feasibility of real life projects

2.4. Course Topics:

Course Topics	Week	Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Basic concept of engineering economics	1	√			
Cash flow	2	√	√		
Compound interest formula	3		√		
Time value of mony	4		√		
Nominal and effective interest	5		√		
Equivalence	6		√		
Present worth value	7		√		
Midterm Exam	8				
Benefit/Cost ratio	9			√	
Annual cost	10			√	
Economics analysis of engineering alternative	11			√	
Rate of return	12			√	
Depteciation	13				√
Income taxes	14				√
Practical exam	15	Not Applicable			
Final Exam	16				
Total		2	6	4	2

2.5. Lab Topics:

N.A.

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
Lecture	√	√		
Tutorial	√	√		
Report		√	√	√
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2		CLO4
Formative Assessment Method					
Tests	Quizzes	√	√		
	Midterm Exam	√	√		
Assignments		√	√		
Report			√		√
Presentation					√
Summative Assessment Method					
Final Exam		√	√		

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2-6 , 9-13	5 %
Midterm exam	8	10 %
Quizzes	3:7	5 %
Report	10	10 %
Presentation	15	10 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	Not used
Essential Books (Textbooks):	Basics of Engineering Economy, Leland Blank & Anthony Tarquim, McGraw HILL, ThirdEdition, 2020, ISBN-13 : 978-1260571141

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
PO3	√	
PO7		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO9			√	√
PLO14	√	√		

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment
PLO14	PO7	CLO1	Lecture Tutorial	Quizzes Midterm Exam Assignments Final Exam
		CLO2	Lecture Tutorial Report	Quizzes Midterm Exam Assignments Final Exam Report
PLO9	PO3	CLO3	Report Presentation	Report Presentation
		CLO4	Report Presentation	Report Presentation

Course Coordinator: Dr. Mohamad Samer Mohamad Samer

Head of Department: Prof. Dr. Hala Refat Date:

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	10/9/2024			
Course Title	Projects Management		**Code**	**C 1402**
Type	**Compulsory** ☒		**Elective** ☐	
Semester	2nd Semester			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course description:

Definitions used in projects management - The project life cycle - Project stages - Relationships and responsibilities of the different project parties - Execution phase responsibilities - Productivity - Quality management.

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**	Use the concept of quality control during design and construction, field verification, and review
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	Work in and lead a heterogeneous team to evaluate the quality control during design and construction, field verification, and review
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO3**	Design of constructions systems that meet specified needs with applicable standards to the Projects Management

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	**CLO1**	Illustrate the different terms used in projects management.
		CLO2	Describe the Project stages and parties.
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO3**	Demonstrate the responsibility on the project organizational chart and the construction activities and its relationships
		CLO4	Prepare execution plan and Execution Methods (Apply).
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.	**CLO5**	Analyze the construction productivity and duration per each activity
		CLO6	Perform Quality Management plan and its improvement methods (Create).

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Define the different terms used in projects management	**1**	√					
Project life cycle	**2**	√					
Project stages	**3**		√				
Project parties	**4**		√				
Define of responsibility on the project organizational chart	**5**			√			
Construction activities and its relationships	**6**			√			
Difference between execution phase responsibility and organizational responsibility	**7**				√		
Midterm exam	**8**						
Prepare execution plan and Execution Methods	**9**				√		
Analysis of construction productivity	**10**					√	

Calculate construction duration per each activity.	**11**					√	
Prepare time plan for construction activity and processes	**12**					√	
Define the importance of Quality in Construction	**13**						√
Dimensions of quality: Performance, features, Difference between Quality Assurance and Quality Control	**14**						√
Practical Exam	**15**						
Final Exam	**16**						
Total		**2**	**2**	**2**	**2**	**3**	**2**

2.5. Lab Topics:
N.A

2.6 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. 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						

2.7 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Test	Midterm Exam	√	√	√	√		
Mini Projects		√			√	√	√
Assignments			√		√	√	√
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 7 , 9 - 12	10 %
Midterm exam	8	20 %
Mini Projects	13	10 %
Final exam	15	60 %
Total		**100 %**

2.8. List of Reference:

Essential Books (Textbooks):	Construction Project Management: Planning, Scheduling and Controlling (2019) K. K. Chitkara. Construction Project Scheduling and Control (2015) Saleh A. Mubarak, Waily. Construction Project Management 6th Edition (2015) S. Keoki Sears , Glenn A. Sears , Richard H. Clough, Jerald L. Rounds, Robert O. Segner.
Recommended Books:	Construction Project Management: A Practical Guide to Field Construction Management 5th Edition (2015) by S. Keoki Sears, Glenn A. Sears, Richard H. Clough.
Periodicals, Web Sites, … etc:	https://www.pmi.org/ https://www.ecosys.net/knowledge/construction-project-management/ https://www.coursera.org/learn/construction-project-management https://www.projectmanager.com/guides/construction-project-management

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		
	CO1	CO2	CO3
PO1	√		
PO3		√	
PO6			√

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

Program Learning Outcomes	Course Learning Outcomes					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
PLO1	√	√				
PLO6			√	√		
PLO13					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture • Discussion	• Mid-Term Exam • Final Exam • Mini Projects • Assignments
		CLO2	• Lecture • Discussion	• Mid-Term Exam • Final Exam • Assignments
PLO6	PO3	CLO3	• Lecture	• Mid-Term Exam • Final Exam
		CLO4	• Lecture • Tutorials • Project-based Learning	• Mid-Term Exam • Final Exam • Assignments • Mini Projects
PLO13	PO6	CLO5	• Lecture • Tutorials • Project-based Learning	• Final Exam • Assignments • Mini Projects
		CLO6	• Lecture • Tutorials • Project-based Learning	• Final Exam • Assignments • Mini Projects

Course Coordinator: Ass. Prof.: Ahmed Nouh Ahmed Ahmed Nouh

Head of Department: Prof. Dr. Hala Refat Date:

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Civil Engineering Department			
Date of Specification Approval	**10/9/2024**			
Course Title	Design of Foundations (b)		**Code**	C1462
Type	Compulsory ☒	Elective ☐		
Semester	2nd Semester (4 Year)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	-	5

2. Professional Information:

2.1. Course Description:

Design of deep foundations (Piles foundations - Piers - Caissons - Construction and design of retaining walls - Construction and design of sheet pile walls) - Construction and design of ground steel tanks - Foundations on difficult soil.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Evaluate the principles of sheet pile walls and retaining walls, choosing an appropriate type of support system suitable for safety standards, considering economic and social factors.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Design different types of deep foundations and foundations on difficult soils considering safety risks, applicable standards, and economy.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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**	Explain the classification and construction methods of deep foundations and retaining structures
		CLO2	Determine the bearing capacity for the deep foundation.

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 sheet pile walls and retaining walls to produce cost-effective solutions.
		CLO4	Design with full detailing for the deep foundations

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Construction methods of Sheet pile walls	**1**			√	
Design of Sheet pile walls	**2**			√	
Stability of Retaining walls	**3**			√	
Design of Retaining walls	**4**			√	
Design of Special types of Retaining walls	**5**			√	
Bearing Capacity of Piles	**6**		√		
Settlement of piles group-Pile load test	**7**		√		
Midterm Exam					
Laterally Loaded Piles (Inclined Piles)	**9**				√
Design of Pile Caps	**10**				√
Design of Pile Caps	**11**				√
Piers and Caissons	**12**				√
Classification of deep foundations	**13**	√			
Construction methods of deep foundations	**14**	√			
Practical Exam	**15**				
Final Exam	**16**				
Total		**2**	**2**	**5**	**4**

2.5 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. 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				

2.6 Assessment Methods:

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Midterm Exam		√	√	
	Quizzes			√	√
Mini Project					√
Report		√			
Assignments			√	√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.6.1. Assessment Schedule & Grades Distribution:

Assessment Method	Week	Weighting of Asses.
Assignments	2 to 7 & 9 to 12	1.6 %
Report	4	1.6 %
Midterm exam	8	25.6 %
Mini Project	12	1.6 %
Quizzes	4 &12	9.6 %
Final exam	16 and above	60%
Total		**100%**

2.7. 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. • Hemed a, Advances in Soil Mechanics and Foundation Engineering, IntechOpen, London ISBN: 978-1-78984-290-6,2020
Recommended Books:	• Bowles, J., Foundation Analysis and Design, McGraw - Hill, 5th. Ed., ISBN 978 – 007 - 912 – 247 – 7, 2009.

2.8. 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
PO2	√	
PO6		√

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:

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO3	√	√		
PLO12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO3	PO2	CLO1	• Discussion	• Report • Final Exam
		CLO2	• Lecture • Tutorials	• Midterm Exam • Final Exam • Assignment
PLO12	PO6	CLO3	• Lecture • Tutorials	• Midterm Exam • Final Exam • Assignments • Quiz
		CLO4	• Lecture • Tutorials • Project-based Learning	• Final Exam • Assignments • Quiz • Mini Project

Course Coordinator: Dr. Mohab Roshdy Ahmed

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	**10/9/2024**			
Course Title	Steel Structures Design (2)		**Code**	C1472
Type	**Compulsory** ☒	**Elective** ☐		
Semester	**2nd Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	4	2	-	6

2. Professional Information:

2.1. Course description:

Classical bridge types - Different bridge systems such as arches, trusses and suspension bridges - Design loads (Road way loading - Railway loading - Other loads on bridges) - Design of floor beams systems (Stringer - Cross girders - Floor connections) - Design for fatigue and stress range concepts - Design of plate girder bridges (Preliminary proportioning - Design for bending - Design for shear - Combined shear and moment - Buckling of plates - Longitudinal and transversal stiffeners - Load bearing stiffeners - Splices - Curtailment of flange plates - Details) - Wind bracing systems - Design of bridge bearings.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Design the elements of the steel bridges and the plate girders adhering to engineering code.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Illustrate buckling of the steel plates and its stiffeners.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental,	**CLO1**	Use specified consideration to planning the steel bridges.
		CLO2	Apply of different loads, structural analysis of steel structure.

	ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.		
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 Steel bridge elements.
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 bridge structures to check the allowable stresses.
		CLO6	Utilize codes of practice and standards of steel bridge structural to check safety requirements (serviceability &deflection)

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to Steel Bridges	**1**	√					
Layout of road way steel bridges.	**2**	√					
Design of Stringers according to fatigue and stress range concepts.	**3**	√	√	√			
Design of stringer as a composite section.	**4**				√	√	√
Design of cross girders	**5**		√		√	√	√
Loads on Main-girder.	**6**		√				
Design of Main-girder - Buckling of plates.	**7**			√	√	√	√
Mid-term exam.	**8**						
Lateral Torsional Buckling.	**9**				√	√	
Curtailment of flange plates - Details.	**10**					√	√
Longitudinal and transversal stiffeners	**11**		√		√	√	√
- Load bearing stiffeners.	**12**		√				√
- Design of Splices	**13**		√		√	√	√

Design of Wind bracing systems.	**14**		√		√	√	√
Design of bridge bearings.	**15**						√
Total	**15**	**3**	**7**	**2**	**7**	**8**	**9**

2.5. Lab Topics: not applicable

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**		**CLO6**
1. Lectures.	√	√	√	√		
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						

2.7 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	Quizzes	√			√	√	
	Mid-term Exam	√	√	√	√	√	√
Assignments					√	√	√
Summative Assessment Method							
Final Exam			√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	**Week**	**Weighting of Asses.**
Assignments	4,7,10,12	3.34 %
Quiz	5,11	10%
Mid-term exam	8	26.67 %
Final exam	16 and above	60 %
Total		**100%**

2.8. List of Reference:

Course Notes:	Staff lectures notes.
Essential Books (Textbooks):	1. Egyptian code for design of steel structures.
Recommended Books:	1- Design of bridge structures, T. R. Jagadeesh and M. A. Jayaram, third edition 2020, ISBN 978-9389347609.
Periodicals, Web Sites, … etc:	

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
PO2	√	
PO6		√

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	**PO2**	**CLO1**	• Lectures.	• Mid-term Exam • Final Exam. • Quiz
		CLO2	• Lectures.	• Mid-term Exam • Final Exam.
PLO12	**PO6**	**CLO3**	• Lectures.	• Mid-term Exam • Final Exam.
		CLO4	• Lectures. • Tutorials.	• Mid-term Exam • Final Exam. • Quiz • Assignments.
PLO4		**CLO5**	• Tutorials.	• Mid-term Exam • Final Exam. • Quiz • Assignments.
		CLO6	• Tutorials.	• Mid-term Exam • Final Exam. Assignments.

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

Head of Department: Prof. Dr. Hala Refat Date:

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the Program	Civil Engineering Department			
Department Offering the Course	Civil Engineering Department			
Date of Specification Approval	10/9/2024			
Course Title	Project		Code	C1500
Type	Compulsory ☒	Elective ☐		
Semester	First & Second Semester (Fourth Year)			
Teaching Hours:	Lec.	Tut.	Lab.	Contact hours
First Semester	1	0	1	2
Second Semester	1	0	5	6
Total Teaching Hours	2	0	6	8

2. Professional Information:

2.1. Course description:

The student deals with the analysis of a complete engineering project using the fundamentals, principles, and skills he gained during his study. The project report presented by the student should include the details of the analysis and design satisfying the concerned codes requirements, the computer applications as well as the experimental work, when necessary, in addition to the technical engineering drawing of his design. The project report is to be submitted and discussed by the end of the project. The student should prove his complete understanding of the elements of the project and his capability to apply them in his future engineering.

2.2. Course Objectives (CO):

Program objective		Course objective	
PO 5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO 1**	Apply searching, problem-solving, effective data collection, writing and self-learning skills and the need to engage long life learning
PO 2	Behave professionally, adhere to engineering ethics and standards, with understanding the role of the engineer in society, considering the economic, environmental, and cultural impact.	**CO 2**	Illustrate alternatives that should satisfy the needs of safety, applicable standards, economic, environmental, cultural, and societal considerations
PO 7	Incorporate economics and business practices including project risk and change management into the practice of engineering and to understand their limitations.	**CO 3**	Analyze the alternative with respect to cost requirements
PO 6	Design of constructions that meet specified needs with appropriate attention to health and safety risks,	**CO 4**	Appraise the selected alternative with respect to cost and other social requirements

	applicable standards, economic, environmental, cultural, and societal considerations.		
PO 4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO 5**	Evaluate the ability to present, interpret, and discuss the project idea, methodology and results
PO 3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO 6**	Evaluate the capability of working independently and as a team leader or team member

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO5	Practice research techniques and methods of investigation as an inherent part of learning	**CLO1**	Apply technical literature and other information sources.
PLO 10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	**CLO2**	Identify the project problem and idea.
PLO 3	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**	Describe alternatives on which the design will be achieved.
		CLO4	Apply the alternatives to meet the consideration of social, economic, environmental, ethical, and the principles and contexts of sustainable design and development.
PLO 14	Deal with biddings, contracts and financial issues including project insurance and guarantees	**CLO5**	Analyze the cost of each alternative.
PLO 13	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.	**CLO6**	Compare between the alternatives with respect to their impacts.

PLO 11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO7**	Select the best alternative
PLO 12	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.	**CLO8**	Revise the optimum design.
PLO 7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**CLO9**	Prepare a detailed well-structured calculation report dealing with the design.
PLO 8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO10**	Prepare a detailed well-structured working drawing dealing with the design.
PLO 9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO 11**	Prepare for final discussion through presentation, also outline each team member responsibility,

2.4. Course Topics:

Students can select the graduation project which they desire, then the department approves their selection according to their desires and grades.

First semester

Course Topics	**Week**	**Course LO's Covered**										
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO 8**	**CLO 9**	**CLO 10**	**CLO 11**
Review technical literature and other information sources.	**1**	√										
	2	√										

Define the problem. Define objectives.	**3**		√									
Data collection.	**4**			√								
Brainstorm	**5**			√								
Develop alternatives (solutions).	**6**			√								
	7			√								
Midterm Exam	**8**	**Not applicable**										
• Analysis data of solutions under different impacts (safety, economy, and environment).	**9**				√	√						
	10				√	√						
	11				√	√						
	12				√	√						
• Select the best alternative, considering it as final project.	**13**						√	√				
	14						√	√				
Oral Exam + Practical Exam (If applicable in the project)	15											
Final Exam	16	Not applicable										
Total	**13**											

Second semester

Course Topics	**Week**	**Course LO's Covered**										
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO 8**	**CLO 9**	**CLO10**	**CLO 11**
Evaluation the work of the first term by the students and make necessary modifications if needed. Then design the main elements of project	**1**								√			
	2								√			
	3								√			
	4								√			
	5								√			
	6								√			
	7								√			
Midterm Exam	**8**	**Not applicable**										
Preparing project report calculation sheet and working drawing.	**9**									√	√	√
	10									√	√	√
	11									√	√	√
	12									√	√	√
	13									√	√	√
	14									√	√	√
Practical Exam	**15**	**If applicable in the project**										
Final Exam	**16**	**According to faculty council**										
Total	**13**											

After second semester

Course Topics	Week	Course LO's Covered										
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO 8	CLO 9	CLO10	CLO 11
Finalizing Report of calculation, working drawing, and presenting for the projects.	1									√	√	√
	2									√	√	√
	3									√	√	√
	4									√	√	√
Final Exam		**According to faculty council**										
Total	**4**											

2.5. Lab Topics: if included in the project

Lab Topics	Week	Course LO's Covered											
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9	CLO10	CLO 11	CLO 12
Total													

2.7 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered										
Methods	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9	CLO10	CLO 11
Lecture			√	√	√	√	√	√			
Tutorials			√	√	√	√	√	√	√	√	
Self-learning	√	√			√	√	√	√			
Brainstorming					√	√	√	√	√	√	
Computer-based Learning Or Practical-based Learning Or both						√	√	√			
Problem-based Learning					√	√	√	√			
Report	√	√			√	√	√	√			√
Project			√	√	√	√	√	√	√	√	√
Teaching and Learning Methods for Students with Special Needs:											
Methods											
Discussion Session											

Extra Lectures
Provide different levels of books and materials

2.8 Assessment Methods

Assessment Methods:		Course LOs Covered										
Methods		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	CLO9	CLO10	CLO 11
Projects	1st semester	√	√	√	√	√	√	√				
	2nd semester								√	√	√	√
Final (oral) Exam		√	√	√	√	√	√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

First semester

Assessment Method	Week	Weighting of Asses.
Project	15	**20 marks**
Oral Exam		**30 marks**
Total		**50 marks**

Second semester

Assessment Method	Week	Weighting of Asses.
Project	**After one month approximately from finishing final exam of second semester**	**50 marks**
Oral Exam		**100 marks**
Total		**150 marks**

2.8. List of Reference: (Max. five years ago)

Course Notes:	According to lecturer
Essential Books (Textbooks):	According to project type
Recommended Books:	According to project type
Periodicals, Web Sites, … etc:	According to project type

2.9. 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					
	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6
PO 5	√					
PO 2		√				
PO 7			√			
PO 6				√		
PO 4					√	
PO 3						√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes										
	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5	CLO 6	CLO 7	CLO 8	CLO 9	CLO 10	CLO 11
CO 1	√	√									
CO 2			√	√							
CO 3					√	√					
CO4							√	√			
CO5									√	√	
CO6											√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes										
	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5	CLO 6	CLO 7	CLO 8	CLO 9	CLO 10	CLO 11
PLO 5	√										
PLO 10		√									
PLO 3			√	√							
PLO 14					√						
PLO 13						√					
PLO 11							√				
PLO 12								√			
PLO 7									√		
PLO 8										√	
PLO 9											√

3.5. Assessment Alignment Matrix

PLO	PO	CLO	CO	Teaching M.	Assessment M.
5	5	1	1	• Self-learning • Report	• Project • Oral Exam
10		2		• Self-learning • Report	• Project • Oral Exam
3	2	3	2	• Lecture • Tutorials • Project	• Project • Oral Exam
		4		• Lecture • Tutorials • Project	• Project • Oral Exam
14	7	5	3	• Lecture • Tutorials • Self-learning • Brainstorming • Problem-based learning • Report • Project	• Project • Oral Exam
13	6	6		• Lecture • Tutorials • Self-learning • Brainstorming	• Project • Oral Exam

				• Computer-based Learning • Problem-based learning • Practical- based learning • Report • Project	
11	6	7	4	• Lecture • Tutorials • Self-learning • Brainstorming • Computer-based Learning • Problem-based learning • Practical- based learning • Report • Project	• Project • Oral Exam
12	6	8		• Lecture • Tutorials • Self-learning • Brainstorming • Computer-based Learning • Problem-based learning • Practical- based learning • Report • Project	• Project • Oral Exam
7	3	9	5	• Tutorials • Brainstorming • Project	• Project • Oral Exam
8	3	10		• Tutorials • Brainstorming • Project	• Project • Oral Exam
9	3	11	6	• Report • Project	• Project • Oral Exam

Course Coordinator: Dr Ahmed Gamal M. Morsi

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	10/9/2024			
Course Title	Earthquake Engineering and Structural Dynamics		**Code**	C 1512
Type	**Compulsory** ☐		**Elective** ☒	
Semester	**2nd Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course description:

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.
PO5	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):

Program Learning Outcomes		Course Learning Outcomes	
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO1**	Form the Equation of motion for single and multi-degree of freedom systems
		CLO2	Investigate free and forced vibration

		CLO3	Study undamped and damped vibration
		CLO4	Examine single and multi-degree of freedom systems
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics	**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 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)	6,7	√	√	√	√		
Midterm Exam	**8**						
Two degree of freedom systems	9	√	√		√		
Multi degree of freedom systems	10		√		√	√	
Model analysis (Eigen value problem)	11	√	√		√		
Mode shapes (Eigen vector)	12	√	√		√	√	
Seismological background and Lateral load resisting systems	13					√	√
Introduction to Earthquake analysis	14,15					√	√
Practical Exam	**15**						
Final Exam	**16**	√	√	√	√	√	√
Total		**9**	**9**	**2**	**7**	**7**	**3**

2.5. Lab Topics:

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
1. Lectures					√	√
2. Tutorials					√	√
3.Report	√	√	√	√		
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						

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Formative Assessment Method							
Tests	**Midterm exam**					√	
	Quiz					√	√
Assignments						√	√
Report		√	√	√	√		
Presentation		√	√	√	√		
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses %
Tests	Midterm exam	8	24
	Quiz	3,5,10,13	4
Assignments		3,4,6,7,13	4
Report		14	4
Presentation		14	4
Final Exam		**16**	60
Total			**100**

2.8. 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)

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	
	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
PLO5	√	√	√	√		
PLO11					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO5	PO5	CLO1	• Report • Self-Learning	• Report • Presentation • Final Exam
		CLO2	• Report • Self-Learning	• Report • Presentation • Final Exam
		CLO3	• Report	• Report • Presentation

			• Self-Learning	• Final Exam
		CLO4	• Report • Self-Learning	• Report • Presentation • Final Exam
PLO11	**PO1**	**CLO5**	• Lectures • Tutorials	• Midterm exam • Quiz • Final Exam • Assignments
		CLO6	• Lectures • Tutorials	• Quiz • Final Exam • Assignments

Course Coordinator: Dr. Ahmed Abd El-Salam

Head of Department: Prof. Dr. Hala Refat Date:

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering				
Department Offering the course	Civil Engineering				
Date of Specification Approval	**10/9/2024**				
Course Title	New Construction Materials			**Code**	**C 1522**
Type	**Compulsory** ☐		**Elective** ☒		
Semester	**Second Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**-**	**5**	

2. Professional Information:

2.1. Course description:

Different types of new construction materials - Constituent materials of the new construction materials - Properties of the new construction materials (Physical, Chemical & Mechanical properties) - Fabrication technology - Comparison with conventional construction materials - Structural applications - Testing - Economical point of view.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Evaluate a new construction materials.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Use the new construction materials according to applicable standards, economic, environmental, cultural, and societal considerations.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess,	**CLO1**	Use the new construction materials.

	and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**CLO2**	Judge on the experimental results for new construction materials.
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	Choose suitable materials and techniques for civil engineering applications.
		CLO4	Determinate the properties of new construction materials.
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.	**CLO5**	Manage appropriate new construction techniques.
		CLO6	Assess the quality of construction materials.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Introduction to new construction materials	**1**				√	√	√
Introduction to strengthening and repair of RC structures	**2**					√	√
Strengthening of RC columns using FRP	**3**				√	√	
Strengthening of RC flexural elements using FRP	**4,5**				√	√	
High strength concrete	**6**				√	√	√
High Performance concrete (I).	**7**				√	√	√
Mid-term Exam	**8**						
Light weight concrete	**9,10**	√	√				
Geopolymer concrete	**11**	√	√				
Other concretes for special applications (I)	**12,13**	√	√	√			

Other concretes for special applications (III)	**14**			√			
Practical and Oral Exam	**15**						
Final Exam	**16**						
Total		**5**	**5**	**2**	**7**	**7**	**4**

2.5. Lab Topics:
N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1.Lecture			√	√	√	√
2.Tutorial			√	√	√	√
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						

2.7 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	Oral Test	√	√				
	Midterm Exam	√	√	√	√	√	√
Assignments		√	√	√	√	√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	**Week**	**Weighting of Asses.**
Assignments	**2 to 8 & 10 to 14**	**5%**
Midterm Exam	**8**	**20%**
Oral Exam	**15**	**10%**
Final Exam	**16 or more**	**60%**
Total		**100%**

2.8. List of Reference: (max. five years ago)

Course Notes:	Used
Essential Books (Textbooks):	الكوود المصووولأس تووروم وصووومطا انووو لأا و طووو البووو لطملأا المةووو ب لط ف في مج لا ال شططد – 208.
Recommended Books:	"Construction Materials, their Nature and Behavior", Fourth Edition, Edited by Peter Domone and John Illston.
Periodicals, Web Sites, … etc:	https://www.sciencedirect.com/journal/construction-and-building-materials

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	√	
PO6		√

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
PLO2	√	√				
PLO11			√	√		
PLO13					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Discussion	• Written exam • Assignments • Oral exam
		CLO2	• Discussion	• Written exam • Assignments • Oral exam
PLO11	PO6	CLO3	• Lecture • Tutorial	• Written exam • Assignments
		CLO4	• Lecture • Tutorial	• Written exam • Assignments
PLO13		CLO5	• Lecture • Tutorial	• Written exam • Assignments
		CLO6	• Lecture • Tutorial	• Written exam • Assignments

Course Coordinator: Prof. Dr\ Khaled Mohamed El-Sayed

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	**10/9/2024**			
Course Title	**The Global Positioning System (GPS)**		**Code**	**C 1532**
Type	**Compulsory ☐**		**Elective ☒**	
Semester	**Second Semester (Fifth Year)**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course description:

Introduction to GPS - GPS basis and idea - Field procedure in GPS surveys - Data types used in GPS - Satellite positioning and ground control system - Uses of GPS in civil engineering - Hardware and software requirements.

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**	Illustrate the basic principle of the global positioning system (GPS)
		CO2	Apply analytic skills to solve engineering problems in the branch of GPS

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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 a** suitable software used in GPS analysis
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range	**CLO2**	Identify the idea of GPS
		CLO3	Discuss the data types used in GPS
		CLO4	demonstrate the Satellite positioning and ground control system
		CLO5	Explain the application of GPS in civil engineering

	of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.		

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Introduction to GPS	1-2		√			
GPS basis and idea	3-4		√			
Field procedure in GPS surveys	5		√			
Data types used in GPS	6-7			√		
Mid-Term	8					
Satellite positioning and ground control system	9-10				√	
Uses of GPS in civil engineering	11-12					√
Hardware and software requirements	13-14	√				
Practical and Oral Exam	**15**					
Final Exam	**16**					
Total		**2**	**5**	**2**	**2**	**2**

2.5. Lab Topics:

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
1. Lecture	√		√	√	√
2. Tutorials	√		√	√	
3. 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	CLO5
Formative Assessment Method						
Tests	Midterm Exam		√	√		
Assignments		√				
Quiz						√
Summative Assessment Method						
Final Exam			√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	8	24%
Assignments	14	8%
Report	13	8%
Final Exam	16	60%
Total		**100%**

2.8. List of Reference:

Course Notes:	Lecture Notes
Essential Books (Textbooks):	Understanding Earth Observation, Domenico Solimini,2016, ISBN 978-3-319-25632-0 ISBN 978-3-319-25633-7 (eBook)
Recommended Books:	• Seeber · Satellite Geodesy -2nd completely revised and extended edition - Walter de Gruyter ·Berlin New York 2003 - ISBN 3-11-017549-5 • Zhilin Li, Qing Zhu, Christopher Gold (2004) DIGITAL TERRAIN MODELING Principles and Methodology -ISBN 0-415-32462-9.

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	CLO5
CO1		√	√		√
CO2	√			√	

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes				
	CLO1	CLO2	CLO3	CLO4	CLO5
PLO2	√				
PLO11		√	√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Computer-based Instruction	• Assignments
PLO11		CLO2	• Lecture • Tutorials	• Midterm Exam • Final Exam
		CLO3	• Lecture • Tutorials	• Midterm Exam • Final Exam
		CLO4	• Lecture • Tutorials	• Final Exam
		CLO5	• Lecture	• Quiz

Course Coordinator: Dr.Ahmed El-Hadary

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	**10/9/2024**			
Course Title	Remote Sensing		**Code**	C 1534
Type	**Compulsory** ☐		**Elective** ☒	
Semester	2nd Semester			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	2	-	5

2. Professional Information:

2.1. Course description:

Basics and principles of remote sensing - Definitions - Energy sources - Advantages of remote sensing technique - Photo and image interpretation - Control points and ground truth observations - Field work steps - The use of remote sensing in GIS applications - Hardware and software required for image processing and interpretations..

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**	**Apply** wide sets of remote sensing knowledge, science, and specialized skills.
		CO2	**Solve** surveying and remote sensing problems in real-life situations.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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**	**Identify** the fundamental of the remote sensing systems.
		CLO2	**Illustrate** the different remote sensing observations.

PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	**Discuss** applications of new satellite images processing techniques.
		CLO4	**Determine** appropriate and sustainable technologies of remote sensing measurements.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to remote sensing	1	√			
Basics and principles of remote sensing and Definitions	2, 3	√			
Energy sources	4, 5	√	√		
Advantages of remote sensing technique	6				√
Photo and image interpretation	7		√		√
Midterm Exam	**8**				
Control points and ground truth observations	9			√	√
Field work steps	10		√		
The use of remote sensing in GIS applications	11,12			√	√
Hardware and software required for image processing and interpretations	13,14	√			√
Practical and Oral Exam	**15**				
Final Exam	**16**				
Total		**8**	**4**	**3**	**9**

2.5 Lab Topics

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Midterm Exam	√	√	√	√
Quiz				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm exam	**9**	**24%**
Quiz	**6, 13**	**16%**
Final exam	**16 and above**	**60%**
Total		**100%**

2.8. List of Reference:

Essential Books (Textbooks):	Remote Sensing: Principles, Interpretation, and Applications, by Sabins & Ellis. 4th edition, 2020.
Recommended Books:	(1) Remote Sensing and Image Interpretation by Lillesand, Kiefer, and Chipman,7th Edition, 2015. Wiley, and Sons. ISBN: 9781118343289. (2) Remote sensing of vegetation: Principles, techniques, and applications by Jones & Vaughan.1st Edition, 2010. Oxford University Press. ISBN:9780199207794.

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	
	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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO2	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Discussion	• Written Exam
		CLO2	• Discussion	• Written Exam
PLO11		CLO3	• Lecture • Tutorials	• Written Exam • Quiz
		CLO4	• Lecture • Tutorials	• Written Exam • Quiz

Course Coordinator: Dr. Ahmed Elhadary

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	**10/9/2024**			
Course Title	Repair and Strengthening of Concrete Structures		**Code**	**C1552**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	**2nd Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**-**	**5**

2. Professional Information:

2.1. Course Description:

Deterioration causes of concrete structure - Evaluation of concrete structures - Repair and strengthening materials (Types - Testing - Handling) - Bond between repair and strengthening materials and concrete surface - Design of repair and strengthening systems - Repair and strengthening of concrete elements (Foundation - Columns - Beams - Slabs…etc.) - Repair and strengthening of concrete structures against effect of earthquakes and fires - Protection and maintenance of concrete structures.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO1**	Apply the repair and strengthening principles of concrete structures against the effect of earthquakes and fires-protection and maintenance of concrete structures.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO2**	Create the principles of Evaluation of concrete structures, Deterioration causes of concrete structure and Repair and strengthening of concrete .

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO1**	Describe the type of Protection and maintenance of concrete structures.
		CLO2	Illustrate the Repair and strengthening of concrete structures against effect of earthquakes and fires.
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**	Illustrate the Evaluation of concrete structures, and Deterioration causes of concrete structure.
		CLO4	Classify the Repair and strengthening materials, and the Bond between repair and strengthening materials and concrete surface.
		CLO5	Design of repair and strengthening systems for concrete elements.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Deterioration causes of concrete structure	**1,2**			√		
Evaluation of concrete structures	**3,4**			√		
Repair and strengthening materials	**5,6**				√	
Bond between repair and strengthening materials and concrete surface	**7**				√	
Mid term	**8**					
Design of repair and strengthening systems	**9**					√
Repair and strengthening of concrete elements (Foundation - Columns - Beams - Slabs…etc.)	**10-12**					√
Protection and maintenance of concrete structures	**13**	√	√			
Repair and strengthening of concrete structures against effect of earthquakes and fires	**14**	√	√			
Practical Exam	**15**					
Final Exam	**16**					
Total		**2**	**2**	**4**	**3**	**4**

2.5 Lab Topics

N.A

2.6 Teaching and Learning Methods:

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
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					

2.7 Assessment Methods:

Assessment Methods:		Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method						
Tests	Oral Test	√	√			
	Midterm Exam			√	√	
	Report	√	√			
Assignments				√	√	√
Summative Assessment Method						
Final Exam				√	√	√

2.7.1. Assessment Schedule & Grades Distribution:

Assessment Method	Week	Weighting of Asses.
Assignments	**4, 7 ,12**	**5 %**
Midterm exam	**8**	**20 %**
Report	**13 ,14**	**10 %**
Oral Test	**15**	**5%**
Final exam	**16 and above**	**60%**
Total		

2.8. List of References:

Essential Books (Textbooks):	• El-Kasaby, E. A., Repair and strengthening of concrete elements, Dar Al-Kutub Al-Almia, Cairo, 5th Ed., (19441/2015), ISBN 978 – 977 – 726 – 140 – 1, 2015. • El-Kasaby, E. A., Engineering of Shallow 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:	• El-Kasaby, E. A., Repair and strengthening of concrete elements, Dar Al-Kutub Al-Almia, Cairo, 5th Ed., (19441/2015), ISBN 978 – 977 – 726 – 140 – 1, 2015.

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
PO5	√	
PO6		√

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
PLO5	√	√			
PLO13			√	√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO5	PO5	CLO1	• Report	• Oral Test • Report
		CLO2	• Report	• Oral Test Report
PLO13	PO6	CLO3	• Lecture • Tutorials	• Written Exams • Assignments
		CLO4	• Lecture • Tutorials	• Written Exams • Assignments
		CLO5	• Lecture • Tutorials	• Final Exams • Assignments

Course Coordinator: Prof. Dr. El-Sayed Abdel Fattah El-Kassaby

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering				
Department Offering the course	Civil Engineering				
Date of Specification Approval	**10/9/2024**				
Course Title	**Special Concrete Structures**			**Code**	**C 1554**
Type	**Compulsory** ☐		**Elective** ☒		
Semester	**2nd Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**0**	**5**	

2. Professional Information:

2.1. Course description:

Design of Concrete Structures: Pre-stressed concrete (Continuous beams) - Design of high-rise buildings (Loads - Resisting systems - Design of structural elements - Reinforcement details) - Types of R.C. bridges - Design of R.C. bridges (Slab type - Girder type - Box-girder type).

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Behave professionally and adhere to engineering ethics and standards and work.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, nd societal considerations.	**CO2**	Design the Concrete Structures geometrically & structure.
PO7	Incorporate economics and business practices including project risk and change management into the practice of engineering and to understand their limitations.	**CO3**	Incorporate economic and business practices into reinforced concrete structures.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic,	**CLO1**	**Apply** knowledge to choose the better type of structural system.
		CLO2	**Apply** the Principals of designing to the reinforced concrete

	environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.		structural elements.
		CLO3	**Evaluate** Types of R.C. structures
		CLO4	**Analyze** the different RC structure elements using Egyptian codes for reinforced concrete structures.
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 different reinforcement concrete structural elements according to ECP.
		CLO6	**Achieve** an optimum system for planning the RC buildings.

2.4. Course Topics:

Course Topics	**Week**	**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Design of Pre-stressed concrete (Continuous beams)	**1**		√		√		
Continue Design of Pre-stressed concrete (Continuous beams)	**2**		√			√	√
Design of high-rise buildings (Loads)	**3**	√	√				
Design of high-rise buildings (Resisting systems)	**4**		√		√	√	√
Design of high-rise buildings	**5**		√				
(Design of structural elements)	**6**		√	√			√
Design of high-rise buildings (Reinforcement details)	**7**		√	√	√		
Midterm exam	**8**						
Types of R.C. bridges	**9**	√	√	√	√		
Design of R.C. bridges (Slab type)	**10,11**			√	√	√	√
Design of R.C. bridges (Girder type -)	**12**				√	√	√
Design of R.C. bridges (Box-girder type)	**13**				√	√	√
Design of R.C. bridges (Reinforcement details)	**14**				√	√	√
Practical exam	**15**						
Final Exam	**16**						
Total		**2**	**8**	**4**	**8**	**6**	**7**

2.5 Lab Topics

N.A

2.6 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			√	√	√	
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	CLO6
Formative Assessment Method							
Test	Midterm Exam	√	√	√	√	√	√
	Quizzes	√		√			
	Experimental						
Mini Projects				√	√	√	
Assignments		√	√				√
Discussion		√	√	√	√		
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 , 9 - 13	4 %
Midterm exam	8	24 %
quizzes	10	4 %
Discussion	6,9,12	4%
Mini-Project	14	4%
Final exam	16 and above	60 %
Total		**100 %**

2.7. List of Reference:

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

2.8. 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
PO2	√		
PO6		√	
PO7			√

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

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

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO3	PO2	CLO1	• Lecture • Tutorials	• Written Exam • Assignments • Discussion
		CLO2	• Lecture • Tutorials	• Written Exam • Assignments • Discussion
	PO7	CLO3	• Lecture • Project-based Learning	• Written Exam • Quizzes • Discussion • Mini-Project
		CLO4	• Lecture • Project-based Learning	• Written Exam • Quizzes • Discussion • Mini-Project
PLO12	PO6	CLO5	• Lecture • Project-based Learning	• Written Exam • Quizzes • Mini-Project
		CLO6	• Lecture • Tutorials	• Written Exam • Assignments

Course Coordinator: Dr. Mohamed Makhlouf

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering				
Department Offering the course	Civil Engineering				
Date of Specification Approval	**10/9/2024**				
Course Title	Special Foundation			**Code**	**C1562**
Type	**Compulsory** ☐		**Elective** ☒		
Semester	**2nd Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**-**	**5**	

2. Professional Information:

2.1. Course Description:

Introduction to the numerical analysis of shallow and deep foundations - Modern foundations (Design and Construction) - Reinforced earth structures - Foundations for offshore structures - Introduction to construction and design of tunnels and underground structures - Introduction to foundations subjected to dynamic loads.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO1**	Evaluate the principles of reinforced ground structures, marine structures, and underground structures such as tunnels to select an appropriate type of support system appropriate to safety criteria considering economic and societal factors.
		CO2	Design the various types of modern foundations with modern design methods, considering safety risks, applicable standards, and economy.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic,	**CLO1**	Illustrate the construction techniques of underground structures.

	environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**CLO2**	Choose the most appropriate support system for tunnel construction methods to safety criteria considering economic and societal factors.
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 reinforced earth structures and offshore structures.
		CLO4	Design the modern foundations, and foundations subjected to dynamic loads by numerical analysis.

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Introduction to the construction of the underground structures	**1**	√			
Construction considerations in supporting the underground structures	**2**	√			
Construction Methods of tunnels	**3,4**		√		
Construction Methods of tunnels	**4**		√		
Tunnels in Egypt	**5**		√		
Reinforced earth structures	**6,7**			√	
Midterm Exam	**8**				
Reinforced earth structures	**9**			√	
Introduction to the numerical analysis of foundations	**10**				√
Construction considerations of modern foundations and foundations subjected to dynamic loads	**11**				√
Design of modern foundations	**12**				√
Offshore structures	**13,14**			√	
Practical Exam	**15**				
Final Exam	**16**				
Total		**2**	**3**	**5**	**3**

2.5 Lab Topics

N.A

2.6 Teaching and Learning Methods:

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
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				

2.7 Assessment Methods:

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Midterm Exam	√	√	√	
Assignments				√	√
Reports		√	√		
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution:

Assessment Method	Week	Weighting of Asses.
Reports	2, 5	10 %
Assignments	6, 11, 13	10 %
Midterm exam	8	20 %
Final exam	16 and above	60%
Total		**100%**

2.7. 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:	• Bowles, J., Foundation Analysis and Design, McGraw - Hill, 5th. Ed., ISBN 978 – 007 - 912 – 247 – 7, 2009.

2.8. 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
PO6	√	√

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:

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO3	√	√		
PLO12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO3	PO6	CLO1	• Lecture • Discussion	• Written Exams • Reports
		CLO2	• Lecture • Discussion	• Written Exams • Reports
PLO12		CLO3	• Lecture • Tutorials	• Written Exams • Assignments
		CLO4	• Lecture • Tutorials	• Written Exams • Assignments

Course Coordinator: Prof. Dr. El-Sayed Abdel Fattah El-Kassaby

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	**10/9/2024**			
Course Title	Advanced Steel Structures - Elective Course		**Code**	**C1572**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	**2nd Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**-**	**5**

2. Professional Information:

2.1. Course description:

Design of cold-formed sections - Plastic analysis and design (Plastic hinge concept - Determination of collapse mechanism - Plastic analysis and design of rigid frames) - Frame stability and second order effects - Direct analysis method - Design of open web steel joists and steel deck - Topics relevant to bridge design (Beam grids - Curved and skew bridges - Composite bridges - Temperature effect in bridges - Erection of bridges).

2.2. Course Objectives (CO):

Program objective		Course objective	
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO1**	Apply plastic analysis and design of rigid frames.
		CO2	Use frame stability and direct analysis method.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO3**	Design of steel cold-formed steel sections according to standard codes and different elements of the steel bridges.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
PLO3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with	**CLO1**	Apply specified consideration to design the cold-formed steel sections.

	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**	Utilize the plastic analysis and design to calculate the shape factor of different steel cross-sections.
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO3**	Utilize theory of elastic stability to check frame stability.
		CLO4	Discuss the direct analysis method and design of open web steel joists.
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**	Utilize codes of practice and standards of steel structural to calculate the critical straining actions for bridge elements.
		CLO6	Utilize codes of practice and standards of steel structural to design bridge elements.

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Introduction to Cold-formed sections	**1**	√					
Partially stiffened cold-formed sections	**2**	√					
Design of Cold-formed Connections	**3**	√					
Plastic Analysis and design	**4&5**		√				
Introduction to theory of Elastic stability	**6**			√			
Frame stability	**7**			√			
Mid-term Exam	**8**						
Direct analysis method	**9**				√		
Design of open web steel joists and steel deck.	**10**	√					
Introduction to railway Bridges	**11**					√	√
Loads and design of stringer	**12**					√	√
Loads and design of cross girder	**13**					√	√

Design main girder	**14**					√	√
Practical Exam	**15**						
Final Exam	**16**						
Total		**5**	**2**	**3**	**2**	**4**	**4**

2.5. Lab Topics

N.A

2.6 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. Extra Lectures						
3. Provide different levels of books and materials						

2.7 Assessment Methods

Assessment Methods:		**Course LOs Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Formative Assessment Method							
Tests	Quizzes	√	√			√	√
	Mid-term Exam	√	√	√			
Assignments		√	√	√	√	√	√
Reports					√		
Summative Assessment Method							
Final Exam			√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	**Week**	**Weighting of Asses.**
Assignments	3,4,5,6,7	15 %
Quiz	9,10	5%
Mid-term exam	8	20 %
Final exam	16 and above	60 %
Total		**100%**

2.8. List of Reference:

Course Notes:	Staff lectures notes.
Essential Books (Textbooks):	1. Egyptian code for design of steel structures.
Recommended Books:	1- Design of bridge structures, T. R. Jagadeesh and M. A. Jayaram, third edition 2020, ISBN 978-9389347609.
Periodicals, Web Sites, … etc:	

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	CO3	CO4
PO2	√	√		
PO6			√	√

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

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	PO2	CLO1	• Lectures. • Tutorials.	• Mid-Term Exams. • Assignments. • Quiz
		CLO2	• Lectures. Tutorials.	• Written Exams. • Assignments. • Quiz
PLO4	PO6	CLO3	• Lectures. • Tutorials.	• Written Exams. • Assignments.
		CLO4	• Lectures. • Tutorials. • Discussion.	• Written Exams. • Assignments. • Reports.
PLO12		CLO5	• Lectures. • Tutorials.	• Final Exams. • Assignments. • Quiz
		CLO6	• Lectures. • Tutorials.	• Final Exams. • Assignments. • Quiz

Course Coordinator: Dr. Ibrahim Mohamed El-Shenawy

Head of Department: Prof. Dr. Hala Refat Date

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	**10/9/2024**			
Course Title	Highway Construction Management and Quality control		**Code**	**C 1582**
Type	**Compulsory** ☐		**Elective** ☒	
Semester	**1st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course description:

Highway project management procedures and methodology - Application of highway project management - Application of value engineering in highway projects - Production management of asphalt mixture - Quality control and quality assurance.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO 6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO 1**	Evaluate the quality of pavement construction and the pavement condition index hat meet specified needs.
		CO 2	Design the intersection and the thickness of highway.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO1**	Construction of pavement layers.
		CLO2	Evaluate the initial recipient of the road
		CLO3	Evaluate the final recipient of the road
PLO13	Plan and manage construction processes; address construction defects, instability and quality issues; maintain	**CLO4**	Analyze the pavement condition
		CLO5	Choose the best way to maintain the road

	safety measures in construction and materials; and assess environmental impacts of projects.	**CLO6**	Choose the best way to construct the road with respect to life cycle cost (LCC)
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.	**CLO7**	Calculate the pavements of highway.
		CLO8	Design the Intersection of highway.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Construction of pavement layers (Subgrade Soil-Subbase layer – base layer)	**1**	√							
Construction of pavement layers (Prime coat-binder coarse layer – tack coat -wearing surface layer)	**2**	√							
Rigid pavement (introduction – types of rigid pavement -stresses in rigid pavement)	**4**							√	
Design of rigid pavement	**5**							√	
Requirements for the initial and final receipt of road projects	**6**		√						
	7			√					
Midterm exam	**8**								
Design of intersection (plain – flared – fully channelized)	**9**			√					√
	10				√				√
Pavement Distresses	**11**				√				
Pavement Maintenance Management	**12**		√			√			
Application of value engineering on highway projects	**13**					√	√		
	14						√		
Practical and Oral exam	**15**								
Final Exam									
Total		**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**

2.5 Lab Topics
N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
1. Lecture	√	√	√	√	√	√	√	√
2. Tutorials		√	√	√	√		√	√
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								

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered								
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8	
Formative Assessment Method										
Tests	Oral Test						√			
	Midterm Exam	√	√	√				√		
Assignments			√	√	√	√	√	√		
Discussion		√							√	
Summative Assessment Method										
Final Exam		√	√	√	√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution (total mark from 15)

Assessment Method	Week	Weighting of Asses.
Oral exam	15	10 %
Discussion	15	10 %
Assignments	3,5, 7 ,10	5 %
Midterm exam	8	15 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Essential Books (Textbooks):	the Egyptian Code for Urban and Rural Roads Works, (Part 3: Geometric design) (Part 6: Structural design) (Part 9: Prerequisites for the construction of roads within and around cities)

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
PO6	√	√

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

Program Learning Outcomes	Course Learning Outcomes							
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
PLO 6	√	√	√					
PLO13				√	√	√		
PLO12							√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	PO6	CLO1	• Lectures	• Midterm Exam • Discussion
		CLO2	• Lectures • Tutorials	• Midterm Exam • Assignments • Final Exam
		CLO3	• Lectures • Tutorials	• Midterm Exam • Assignments • Final Exam
PLO13		CLO4	• Lectures • Tutorials	• Final Exam • Assignments
		CLO5	• Lectures • Tutorials	• Final Exam • Assignments
		CLO6	• Lectures • Report	• Final Exam • Oral test
PLO12		CLO7	• Lectures • Tutorials	• Midterm Exam • Assignments • Final Exam
		CLO8	• Lectures • Tutorials	• Final Exam • Discussion

Course Coordinator: Dr. Moustafa Abdelsalam Saad

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	**10/9/2024**			
Course Title	**Simulation Models of Transportation and Traffic**		**Code**	**C 1584**
Type	**Compulsory** ☐	**Elective** ☒		
Semester	**2st Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course description:

Techniques of analytic and simulation modeling - Simulation methodology - Steps in developing a simulation model - Validation and analysis of Simulation modeling and results - Computer simulation models – Simulation modeling of signalized intersections

2.2. Course Objectives (CO):

Program objective		Course objective	
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations.	**CO1**	Apply fundamental concepts of simulation and its application in transport
		CO2	Use scientific principles and mathematical simulation framework

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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.	**CLO1**	Apply Steps in developing a simulation model
		CLO2	Use Computer simulation models.
PLO13	Plan and manage construction processes; address construction defects, instability and	**CLO3**	Illustrate the Validation and analysis of Simulation

	quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.		modeling and results.
		CLO4	solve traffic congestion problem by Simulation methodology

2.4. Course Topics:

Course Topics	Week	Course LOs Covered			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Techniques of analytic and simulation modeling	**1**	√			
	2	√			
Simulation methodology	**3**				√
	4				√
Steps in developing a simulation model	**5**	√			
Validation and analysis of Simulation modeling and results	**6**			√	
	7			√	
Midterm exam	**8**				
Computer simulation models	**9**		√		
	10		√		
	11		√		
Simulation modeling of signalized intersections	**12**				√
	13				√
	14				√
Practical exam	**15**				
Final Exam	**16**				
Total		**3**	**3**	**2**	**5**

2.5 Lab Topics

N.A

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		√		√
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		CLO4
Formative Assessment Method					
Tests	Oral Test				√
	Midterm Exam	√	√		√
Projects	Mini Projects		√		√
Assignments		√	√		√
Summative Assessment Method					
Final Exam		√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	**2 to 6 & 9 to 13**	**5 %**
Midterm exam	**8**	**20 %**
Mini Projects	**7**	**5 %**
Oral	**15**	**10 %**
Final exam	**16 and above**	**60 %**
Total		**100 %**

2.8. List of Reference:

Essential Books (Textbooks):	• S. M. Ross, Simulation, 4th edition, Elsevier, 2019 • A. M. Law and W. David Kelton, Simulation Modeling and Analysis, 4rth edition,McGraw Hill, 2015. • R. Dowling, A. Skabardonis, and V. Alexiadis, Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software, FHWA-HRT-04-040.
Recommended Books:	• R. Roess, E. Prassas, and W. McShane, Traffic Engineering, 3rd edition, Prentice Hall, 2014. • S. Washington, M. Karlaftis, and F. Mannering, Statistical and Econometric Methods for Transportation Data Analysis, Chapman & Hall/CRC, 2017.

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	
	CO1	CO2
PO6	√	√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO12	√	√		
PLO13			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO12	PO6	CLO1	• Lecture • Tutorials	• Written Exam • Assignments
		CLO2	• Lecture • Tutorials • Project-based Learning	• Written Exam • Assignments • Mini Projects
PLO13		CLO3	• Lecture • Tutorials	• Written Exam • Assignments
		CLO4	• Lecture • Tutorials • Project-based Learning	• Written Exam • Assignments • Mini Projects • Oral Test

Course Coordinator: Dr. Mostafa Abd Elsalam

Head of Department: Prof. Dr. Hala Refat Date

10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program				
Department Offering the program	Civil Engineering				
Department Offering the course	Civil Engineering				
Date of Specification Approval	**10/9/2024**				
Course Title	**Advanced Sanitary Engineering**			**Code**	**C 1592**
Type	**Compulsory** ☐		**Elective** ☒		
Semester	**Second Semester**				
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**	
	3	**2**	**0**	**5**	

2. Professional Information:

2.1. Course description:

Advanced Sanitary Engineering: Nitrogen removal and recovery, Phosphorous removal and recovery, membrane filtration, adsorption and ion exchange, reverse osmosis, air and flotation and Wastewater reuse .

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO6	. Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations	**CO1**	Illustrate concept of Nitrogen removal and recovery, Phosphorous removal and recovery, membrane filtration .
		CO2	Design the different methods of adsorption and ion exchange, reverse osmosis, air and flotation and Wastewater reuse .

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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.	**CLO1**	Analyze the different data about Nitrogen and membrane filtration.
		CLO2	Discuss the different data about Phosphorous removal and recovery.

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**	Design the different methods of adsorption and ion exchange, reverse osmosis
		CLO4	Use general knowldage about air and flotation and Wastewater reuse.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Nitrogen removal and recovery	**1-3**	√			
Membrane filtration	**4**	√			
Phosphorous removal and recovery	**5-7**		√		
Mid Term	**8**				
Adsorption and ion exchange	**9**			√	
Reverse osmosis	**10**			√	
Air and flotation	**11**				√
Wastewater reuse	**12,13**				√
Wastewater reuse	**14**				√
Practical Exam	**15**				
Final Exam	**16**				
Total		**4**	**3**	**3**	**4**

2.5 Lab Topics

N.A

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
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				

2.6 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2		CLO4
Formative Assessment Method					
Tests	Quizzes	√	√		√
	Midterm Exam	√	√		
Assignments		√	√		√
Summative Assessment Method					
Final Exam		√	√		√

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 , 9 - 13	10 %
Midterm exam	8	20 %
Quizzes	3,5,7,9 - 13	10 %
Final exam	16 and above	60 %
Total		**100 %**

2.7. List of Reference:

Essential Books (Textbooks):	• Metcalf & Eddy. "Wastewater Engineering: Treatment and Reuse", fourth edition , Tata McGraw- Hill edition 2003 • Hammer, M.j."Water and wastewater Technology", Prentice Hall, USA, 2008. • H.T. EL-Dessoky and H,M, Ettouney, “Fundamentals of Salt water desalination”,Elsevier 2002 • Valentina Lazarova, Akica Bahri, “Water reuse for Irrigation, Agriculture, landscapes and turf grass”, CRC press 2005. • Metcalf & Eddy, an AECOM Company, “Water Reuse: Issues, Technologies, and Applications”, McGraw- Hill edition 2007

2.8. 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
PO6	√	√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO12	√	√		
PLO13			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO12	PO6	CLO1	• Lecture • Tutorials	• Written Exam • Assignments • Quiz
		CLO2	• Lecture • Tutorials	• Written Exam • Assignments • Quiz
PLO13		CLO3	• Lecture • Tutorials	• Written Exam • Assignments • Quiz
		CLO4	• Lecture • Tutorials	• Written Exam • Assignments • Quiz

Course Coordinator: Dr. Osama Abdelaziz Abosiada

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Department Offering the program	Civil Engineering			
Department Offering the course	Civil Engineering			
Date of Specification Approval	**10/9/2024**			
Course Title	**Modeling of Water & Wastewater Networks**		**Code**	**C 1594**
Type	**Compulsory** ☐		**Elective** ☒	
Semester	**Second Semester**			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Contact hours**
	3	**2**	**0**	**5**

2. Professional Information:

2.1. Course description:

Modeling of Water & Wastewater Networks: Modeling of water distribution systems, Analysis and design of water networks using computer applications, Modeling of sewer systems, Analysis and design of Sewer Networks using computer applications and 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	Apply knowledge about Modeling of water distribution systems and sewer system.
PO6	Design of constructions that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations	CO2	Analysis of water networks and sewer Networks using computer applications and applicatiions

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
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	Analyze modeling of water distribution systems.
		CLO2	Discuss the different data about modeling of sewer systems.

PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO3	Design of water networks using computer applications
		CLO4	Design of Sewer Networks using computer applications

2.4. Course Topics:

Course Topics	Week	Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Modeling of water distribution systems	**1-3**	√			
Analysis and design of water networks using computer applications	**4-6**	√		√	
Modeling of sewer systems	**7**		√		
Mid Term	**8**				
Modeling of sewer systems	**9**		√		
Analysis and design of Sewer Networks using computer applications	**10-12**				√
Applications	**13,14**				√
Practical Exam	**15**				
Final Exam	**16**				
Total		**4**	**3**	**3**	**5**

2.5 Lab Topics

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
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				

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2		CLO4
Formative Assessment Method					
Tests	Quizzes	√	√		√
	Midterm Exam	√	√		
Assignments		√	√		√
Summative Assessment Method					
Final Exam		√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	2 - 6 , 9 - 13	10 %
Midterm exam	8	20 %
Quizzes	3,5,7,9 - 13	10 %
Final exam	16 and above	60 %
Total		**100 %**

2.8. List of Reference:

Essential Books (Textbooks):	• Haestad Methods Water Solutions , "Advanced Water Distribution Modeling and Management", Haestad, 2003 • Haestad Methods Water Solutions , "Wastewater Collection System Modeling and Design", Bentley institute press, 2007 • Different software package user guide manuals

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	
	CO1	CO2
PO1	√	
PO6		√

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

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO12	√	√		
PLO13			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Lecture • Tutorials	• Written Exam • Assignments • Quiz
		CLO2	• Lecture • Tutorials	• Written Exam • Assignments • Quiz
PLO11	PO6	CLO3	• Lecture • Tutorials	• Written Exam • Assignments • Quiz
		CLO4	• Lecture • Tutorials	• Written Exam • Assignments • Quiz

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