مقررات المستوى الصفري

Level 0

مقررات المستوى الصفري

Level 0-1

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	Foreign Language	**Code**	UHS101		
Pre-requisite Course Title	……	**Code**	……		
Type	Compulsory ☒	Elective ☐			
Semester	Level 0-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	**2**	-	-	2

2. Professional Information:

2.1. Course description:

The characteristics of the foreign language (English, Deutsch, French, or any foreign language approved by the academic department council and both the faculty and university councils) - Revision of the language grammar – grammar style and effective sentences and their characteristics – Identification of common errors in writing technical sentences – Building basic paragraphs: types of paragraphs, reading and analyzing of excerpts from books in varies disciplines to develop communication skills.

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	**Illustrate** the academic terminologies related to their field of specialization

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** the appropriate written and oral communication in different situations in English.
		CLO2	**Communicate** efficiently to convey ideas verbally.

		CLO3	**Discuss** the abstract ideas and arguments from a range of texts.
		CLO4	**Use** vocabulary as a key ingredient in developing advanced written skills.
PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**CLO5**	**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**
Introduction to course content	1,2	√		√	√	
Revision of the language grammar	3,4				√	
grammar style	5				√	
effective sentences and their characteristics	6	√	√	√	√	
Midterm Exam	7					
Identification of common errors in writing technical sentences	8	√		√	√	
Identification of common errors in writing technical sentences	9					√
types of paragraphs	10,11				√	√
reading and analyzing of excerpts from books in varies disciplines to develop communication skills	12,14	√	√			
Practical Exam	**15**					
Final Exam	**16**					
Total		**7**	**4**	**4**	**9**	**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**
1. Lecture	√		√	√	
2. Discussion		√	√	√	
3. Interactive Learning	√	√			√
4. Self- learning					√
Teaching and Learning Methods for Students with Special Needs:					

Methods
1. Discussion Session
2. Extra Lectures
3. Provide different levels of books and materials

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method						
1. Tests	Mid-Term Exam	√		√	√	
2. Discussions			√	√	√	
3.Reports						√
4.Observation		√	√			√
Summative Assessment Method						
Final Exam				√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	The weighting of Assessment %
Midterm Exam	7	30
Discussion	6,10,11,13	10
Report	15	6
Observation	6,13-15	4
Final Exam	Scheduled by the faculty council	40
Total		100 %

2.8. List of References:

Course Notes:	According to lecturer
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
	EManuel Alvarez-Sandoval, "The Importance of Learning a Foreign Language in a Changing Society", 2005, Universe
Periodicals, Web Sites, … etc:	http:// www.duolingo.com https://elt.oup.com

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		
	CO1	CO2
PO5	√	√

3.2. Course Objectives VS Course Learning Outcomes

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

3.3. Program Learning Outcomes VS Course Learning Outcomes

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

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO8	PO5	CLO1	• Lecture	• Mid-Term Exam
			• Interactive Learning	• Observation
		CLO2	• Interactive Learning	• Observation
			• Discussion	• Discussions
		CLO3	• Lecture	• Mid-Term Exam • Final Exam
			• Discussion	• Discussions
		CLO4	• Lecture	• Mid-Term Exam • Final Exam
			• Discussion	• Discussions
PLO10		CLO5	• Self- learning	• Reports
			• Interactive Learning	• Observation

Course Coordinator: Dr. Mohammad Abdelghany

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	Information and Communication Technology	**Code**	UHS 102	
Pre-requisite Course Title	……	**Code**	……	
Type	Compulsory ☒	Elective ☐		
Semester	Level 0-1			
Teaching Hours	**Credit hours**	**Contact hours**		
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	2	0	0	2

2. Professional Information:

2.1. Course description:

Concepts and terminologies of information technology – Communication styles in teaching and Learning – The internet and learning – multimedia systems – databases – Virtual Reality – Augmented reality – Internet of Things – Robotics and its classification – Artificial Intelligence – Big data – Cloud Computing.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	Illustrate the technology benefits and challenges in modern societies that is necessary for engineering practice.
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO2**	Explore the social dimensions and development according to technology advance and globalization in professional fields.

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	**CLO1**	**Explain** technology and the advantages and disadvantages of using it.
		CLO2	**Describe** how technology affects our

	and risk management principles.		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		√		
Mid-term Exam	7				
Revolutions in Design Sciences	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				√
Practical Exam	**15**				
Final Exam	**16**				
Total		**3**	**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**
1. Lectures	√	√		
2. 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
Formative Assessment Method					
Tests	Mid-term Exam	√	√		
Report				√	√
Oral Test				√	√
Summative Assessment Method					
Final Exam		√	√		

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-term exam	7	30
Oral Test	14	10
Report	14	20
Final written exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	The Nature of Technology: What It Is and How It Evolves, W. Bian Arthur, Penguin Books, 2016.
Recommended Books:	Floyd Fuller, Brain Larson, Lisa Bucki, Faithe Wempen, —Computers: Understanding Technology Comprehensive —, 6th edition, 2016, Kendall Hunt Publishing, ISBN-13 : 978-0763870089

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
PO4	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

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

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO4	√	√		
PLO10			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO4	PO4	CLO1	• Lectures	• Mid-term Exam • Final Exam
		CLO2	• Lectures	• Mid-term Exam • Final Exam
PLO10	PO5	CLO3	• Report • Self-Learning	• Report • Oral Test
		CLO4	• Report • Self-Learning	• Report • Oral Test

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

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 Graphics	**Code**	MEC011		
Pre-requisite Course Title	…….	**Code**	…….		
Type	Compulsory ☒	Elective ☐			
Semester	Level 0-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	0	4	0	4

2. Professional Information:

2.1. Course description:

Engineering drawing techniques and skills. Conventional lettering and dimensioning. Geometric constructions. Theories of view derivation. Orthographic projection of engineering bodies. Derivation of views from isometric drawings and deducing of missing views. Sectioning views: (full, half, offset, partial, revolved, removed, and partial sectioning). Steel construction, Symbols of electrical circuits.

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**	Work in stressful environment to draw Steel construction, Symbols of electrical circuits and isometric drawings.
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO2**	Use the drawing tools as a language for engineers and develop students skills in engineering drawing

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		**Course Learning Outcomes**	
PLO6	Plan, supervise and monitor implementation of engineering	**CLO1**	Draw of the steel structural and electrical circuits Symbols

	projects, taking into consideration other trades requirements.	**CLO2**	Solve problems in the sectioning of engineering objects with rules in engineering drawing
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO3**	Illustrate the engineering drawing (drawing tools, tangency, projections, isometrics, sections, …)
		CLO4	Define the geometry 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		√	√	√
Mid term	7				
Derivation of views from isometric drawings and deducing of missing views.	8		√		√
Orthographic Projection of engineering bodies	9,10		√		√
Steel construction	11,13	√			
Symbols of electrical circuits.	14	√			
Practical Exam	**15**				
Final Exam	**16**	√	√	√	
Total		**4**	**7**	**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**
Tutorials	√	√	√	√
Discussion			√	√
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	Mid-Term Exam		√		√
Assignments		√	√	√	√
Mini Projects		√	√		
Summative Assessment Method					
Final Exam		√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Assignments	An assessment every week	15
Mini Projects	14	15
Mid-term exam	7	30
Final written exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. 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**

2.9. 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		
	CO1	CO2
PO3	√	
PO4		√

3.2. Course Objectives VS Course Learning Outcomes

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

3.3. Program Learning Outcomes VS Course Learning Outcomes

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	• Tutorials • Project-based Learning	• Assignments • Final Exam • Mini Projects
		CLO2	• Tutorials • Project-based Learning	• Mid-Term Exam • Assignments • Final Exam • Mini Projects
PLO8	PO4	CLO3	• Tutorials • Discussion	• Final Exam • Final Exam • Assignments
		CLO4	• Tutorials • Discussion	• Mid-Term Exam • Assignments

Course Coordinator: DR. Mohamed Shehata Mohamed Shehata

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	Mathematics I		**Code**	BES 011	
Pre-requisite Course Title	……..		**Code**	……..	
Type	Compulsory ☒		Elective ☐		
Semester	Level 0-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	0	4

2. Professional Information:

2.1. Course description:

Differential Calculus: 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. Taylor, s and Maclaurin's expansions of functions.
Algebra: Elements of mathematical logic with applications, Matrix algebra and system of linear equations (Gauss elimination, Gauss-Gordon elimination and LU Factorization and Matrix inversion). Eigenvalues and Eigenvectors. Complex variables

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Solve engineering problems using mathematical logic, relations, mappings, real functions and their graphs applications of differentiation, and its applications.
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 a suitable item to evaluate applied engineering problems professionally.

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
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**	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**
Real functions and their graphs	1&2	√	√		
Limits and continuity Elements of mathematical logic with applications	3		√		√
Differentiation of real functions of one Variable	4&5	√			
Gauss elimination, Gauss-Gordon elimination	6	√	√		√
Midterm Exam	7				
Gauss elimination, Gauss-Gordon elimination	6	√	√		√
The first mean value theorem and first order approximation of function	9	√		√	√
Gauss elimination, Gauss-Gordon elimination and LU Factorization	10	√			√
Eigenvalues and Eigenvectors	11		√	√	
The first mean value theorem and first order approximation of function	12	√	√	√	
`	13		√	√	
Complex variables	14	√			√
Practical Exam	**15**				
Final Exam	**16**	√		√	
Total		**11**	**8**	**4**	**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
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	7	**30**
Discussion	3,6,9,11	**15**
Quizzes	4,7,12	**15**
Final Exam	Scheduled by the faculty council	**40**
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
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives		
	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	√	√		
PLO3			√	√

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
PLO3	PO2	CLO 3	• Lecture • Tutorials	• Final Exam • Quizzes
		CLO4	• Tutorials • Problem-based Learning	• Midterm Exam, • Quizzes • Discussion

Course Coordinator: Ass Prof.Dr. Doaa Ahmed Abd-Elwahab

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 (1)	**Code**	BES 021		
Pre-requisite Course Title	……	**Code**	…….		
Type	Compulsory ☒	Elective ☐			
Semester	Level 0-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	0	4

2. Professional Information:

2.1. Course description:

Fundamental of statics, Types of supports, Vector algebra and applications to mechanics, Statics of particles, Moments of forces and couples in space, Equivalent systems of forces and moments, Equilibrium of rigid bodies, Centroids and centers of gravity, Analysis of structures (Truss and Machines), Friction and its application, Virtual work for a system of connected rigid bodies, Stability of equilibrium configuration.

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 the mathematics equilibrium conditions of rest for rigid bodies under the action of various loads.
		CO2	Evaluate the principles of statics as a science for solving the practical problems of engineering applications.

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**	predict the statically equilibrium conditions of a particle under the action of forces
		CLO2	Apply the statically equilibrium conditions of a rigid body under the action of various loads.
PLO2	Develop and conduct appropriate experimentation and/or simulation,	**CLO3**	Analyze the forces acting on the members of structures composed

	analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.		of pin-connected members.
		CLO4	Determine the location of the centroid and the moment of inertia for a body of a regular or irregular shape.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Fundamentals of statics, Statics of Particle in space	1,2	√			
Vector algebra and applications to mechanics, Moment of forces and couples in space	3		√		
Equivalent systems of forces and moments	4,5		√		√
Types of supports, Equilibrium of Rigid bodies in Space	6		√		
Mid-Term Exam	**7**				
Analysis of Structures: Trusses (method of joints)	8			√	
Analysis of Structures: Trusses (method of sections)	9			√	
Analysis of Structures: (Machines)	10			√	
Centroids and centers of gravity	11, 12				√
Friction and its application	13	√			
Virtual work for a system of connected rigid bodies	14			√	
Practical Exam	**15**				
Final Exam	**16**		√	√	√
Total		**2**	**3**	**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	√			
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
Tests	Mid- Term Exam	√	√		
	Quizzes	√	√		
Assignments		√	√	√	√
Summative Assessment Method					
Final Exam			√	√	√

2.7.1 Assessment Schedule & Grades Distribution

Assessment Methods	Week	Weighting of Asses.
Mid-term Exam	7	30
Quizzes	6, 13	15
Assignments	5, 9,11	15
Final exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Course Notes:	Vector Mechanics for Engineers: Statics, 12th Edition Ferdinand P. Beer, E. Russell Johnston, 2019
Recommended Books:	Engineering Mechanics, Statics, 14th Edition- Hibbeler, 2018

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Halls
White Boards
Data Show

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

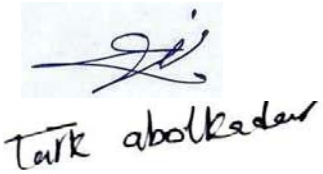
Program Learning Outcomes	Course Learning Outcomes			
	CLO1	CLO2	CLO3	CLO4
PLO1	√	√		
PLO2			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lectures	• Mid-Term Exam • Assignments • Quizzes
		CLO2	• Tutorials	• Written Exam • Assignments
PLO2		CLO3	• Discussion	• Assignments • Final exam
		CLO4	• Discussion	• Assignments • Final exam

Course Coordinator: Dr. Naser Eldin Ab Elsttar

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	Physics I		**Code**	BES031	
Pre-requisite Course Title	…….		**Code**	…….	
Type	Compulsory ☒		Elective ☐		
Semester	Level 0-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	1	5

2. Professional Information:

2.1. Course Description:

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

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Discuss the basic phenomena and theories of mechanical and electromagnetic waves, thermodynamics, heat transfer, and properties of matter physics related to engineering applications.

2.3. Course Learning Outcomes (CLO's):

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, and heat transfer
		CLO4	**Discuss** some of the basic topics on the properties of matter explaining stress and strain and Hooke's law in elasticity and equation of continuity, Bernoulli's equation and its applications, viscosity and surface tension in fluid mechanics.
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**	**Analyze** the results given from experiments.

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Wave Motion	1	√				
Wave Motion	2					√
Sound Waves	3	√				√
Superposition of Waves	4	√				√
Interference of Light	5		√			√
Diffraction of Light	6		√			
Midterm	7					
Heat and the First Law of Thermodynamics	8			√		√
Ideal Gas and its Properties	9, 10			√		√
Heat Transfer	11			√		
Properties of Matter	12					√
Properties of Matter	13, 14				√	
Practical Exam	**15**					√
Final Exam	**16**	√	√	√	√	
Total		**4**	**2**	**4**	**3**	**8**

2.5. Lab Topics:

Lab Topics	Week			Course LO's Covered		
		CLO1	CLO2	CLO3	CLO4	CLO5
Malus' Law	**2**					√
Specific Heat	**3**					√
Resonance in Air column	**4**					√
Single Slit Diffraction	**5**					√
Diffraction Grating	**8**					√
Hooke's Law	**9**					√
Viscosity of a Liquid	**10**					√
Surface Tension of Water	**12**					√
Practical Exam	**15**					√
Total						**8**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
1. Lectures	√	√	√	√	
2. Discussion	√	√	√	√	
3. Practical based learning					√
4. 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:						
		CLO1	CLO2	CLO3	CLO4	CLO5
Formative Assessment Method						
Tests	Quizzes	√		√	√	
	Midterm	√	√			
	Experimental Test					√
	Oral Test					√
Summative Assessment Method						
Final Exam		√	√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quiz 1	5,13	10
Midterm	7	30
Experimental Test	15	10
Oral Test	15	10
Final Exam	Scheduled by the faculty council	40
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, 10th Edition, 2018.
Recommended Books:	Physics: Principles and Applications, Douglas C. Giancoli 7th edition, 2022 Fundamentals of physics, Halliday & Resnick, 12th Edition,2021.

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**	**CLO5**
CO1	√	√	√	√	√

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

PO	PLO	CLO	Teaching M.	Assessment M.
PO1	PLO1	CLO1	• Lectures • Discussion • Tutorials	• Quiz • Midterm • Final Exam
		CLO2	• Lectures • Discussion • Tutorials	• Midterm • Final Exam
		CLO3	• Lectures • Discussion • Tutorials	• Quiz • Final Exam
		CLO4	• Lectures • Discussion • Tutorials	• Quiz • Final Exam
	PLO2	CLO5	• Practical based learning	• Experimental Test • Oral Test

Course Coordinator: Dr: Ibrahim Sayed Ahmed

Head of Department: Prof: Tarek M. Abdolkader
Date: 10 / 9 / 2024

Tark abolkader

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	General Chemistry		**Code**	BES 041	
Pre-requisite Course Title	…….		**Code**	…….	
Type	Compulsory ☒		Elective ☐		
Semester	Level 0-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	4	3	1	2	6

2. Professional Information:

2.1. Course description:

Gases: ideal & real gas laws, kinetic molecular theory - Liquids and solutions - Solids: arrangement of atoms, metallic solids, alloys - Chemical kinetics: reaction rates & order, catalysis – Electrochemistry: electrochemical cells, corrosion– Cements – Polymers – lubricants.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Demonstrate knowledge of laboratory safety and to generalize the analytical and quantitative skills gained and apply them in more advanced courses.
		CO2	Recognize the basic fundamentals in engineering chemistry to provide a broad foundation in chemistry that stresses on the concepts of reaction kinetics, redox reaction and understanding polymers, cements, and lubricants,
		CO3	Classify matter and explain the qualitative and quantitative relationships between state of matter and energy involved in chemical or physical processes.

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 gas laws and differentiate between ideal and real gas behavior.
		CLO2	Recognize the intermolecular forces and solutions colligative properties. Familiarizing with basic principal of lubrication and selection of lubricant.
		CLO3	Describe bonding that can be applied to affect the properties of solids. Identify properties of polymers and their characteristics. Specify requirements of clinker, and chemical admixtures used in concrete technology
		CLO4	Identify reaction order to determine rate law. Recognize different factors affecting on it.
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**	Recognize redox reactions and different types of electrochemical cells. Make stoichiometric calculations for electrolytic processes Recognize corrosion and basic principles to control.
		CLO6	Perform laboratory experiments correctly using appropriate techniques and safety procedures and communicate the results of their experiments via written laboratory reports

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Gas laws & molecular theory	1,2	√				√	√
Intermolecular forces& properties of liquids	3,4		√			√	√
Structure and bonding in solids	5			√		√	√
Reaction rates and the dependence of rate on concentration	6				√	√	√
Mid-Term Exam	7	√	√	√			
Dependence of reaction rate	8				√	√	√
Oxidation reduction reactions	9- 10					√	√
Polymerization reactions	11			√		√	√
Lubricants	12		√				

Cement	13,14			√			
Practical Exam	**15**					√	√
Final Exam	**16**	√	√	√	√	√	
Total		**2**	**3**	**4**	**2**		**10**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**	
		CLO5	**CLO 6**
Introduction to lab. safety rules	1	√	√
Introduction to lab. Glassware	2	√	√
Volumetric determination of NaOH using a standard HCl	3	√	√
Determination of a mixture of carbonate and bicarbonate content of a soda ash sample	4	√	√
Determination of chloride ion concentration	5	√	√
Indirect determination of A mixture of halides.	6	√	√
Determination of ferrous ions in ferrous sulphate using potassium permanganate solution	8	√	√
Titration of ferrous sulphate using potassium dichromate solution	9	√	√
Determination of copper ions in copper sulphate using sodium thiosulphate solution	10	√	√
Determine the consistency of cement using the Vicat apparatus	11	√	√
Experimental Test	**15**	√	√
Total		**10**	**10**

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. Practical-based Learning					√	√
4. Discussion		√	√	√	√	
5.Interactive Learning						√
Teaching and Learning Methods for Students with Special Needs:						
Methods						
1. Discussion Session						
2. Extra Lectures						
3. Provide different levels of books and materials						

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Tests	Mid-Term Exam	√	√	√			
	Experimental Test					√	√
	Oral Test					√	
Assignments		√	√	√	√	√	
Observation							√
Final Exam		√	√	√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-Term Exam	7	30
Experimental	15	10
Oral	15	5
Assignments	2,3,4,9,14	10
Observation	1-11	5
Final Exam	Scheduled by the faculty council	40
Total		100 %

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks)	- P. Barnes, J. Bensted, Structure and Performance of Cements, CRC Press, 2nd Edition, 2019. - Jeffrey Gaffney, Nancy Marley, General Chemistry for Engineers (Enhanced Edition), Elsevier; 2018.
Recommended Books	- Brown, Lawrence S. and Holme, Thomas, "Chemistry for Engineering Students, 4th Edition" (2018). Chemistry Books. 1.https://lib.dr.iastate.edu/chem_books/1

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
PO1	√	√	√

3.2. Course Objectives VS Course Learning Outcomes

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

3.3. Program Learning Outcomes VS Course Learning Outcomes

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

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture • Tutorials	• Mid-Term Exam • Assignments • Final Exam
		CLO2	• Lecture • Tutorials • Discussion	• Mid-Term Exam • Assignments • Final Exam
		CLO3	• Lecture • Tutorials • Discussion	• Mid-Term Exam • Assignments • Final Exam
		CLO4	• Lecture • Tutorials • Discussion	• Assignments • Final Exam
PLO2		CLO5	• Practical-based Learning • Discussion	• Experimental Test • Oral Test • Assignments • Final Exam
		CLO6	• Practical-based Learning • Interactive Learning	• Experimental Test • Observation

Course Coordinator: Prof. Elsayed Fouad

Head of Department: Prof: Tarek M. Abdolkader

Tarek abdolkader

Date: 10 / 9 / 2024

مقررات المستوى الصفري

Level 0-2

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	Societal Issues		**Code**	UHS103	
Pre-requisite Course Title	…..		**Code**	…….	
Type	Compulsory ☒		Elective ☐		
Semester	Level 0-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	2	0	0	2

2. Professional Information:

2.1. Course description:

The awareness of students on many social, environmental, economic, and other contemporary issues in Egypt such as issues of overpopulation in Egypt and its impact on the individual and society - issues of combatting venality and its impact on economic rights and sustainable development – human rights issues – issues of violence against women – public health issues – environmental pollution and desertification -Climate change, water and energy issues – Other important issues in our society..

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO1**	**Illustrate** the different social issues and illustrate how to deal with heterogeneous team
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO2**	**Evaluate** the origins of social problems in the structure of existing social institutions to communicate effectively in professional fields

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**CLO1**	**Examine** scientific research, various types of research, appropriate methods, technologies and data that sociologists use to investigate the

			human condition.
		CLO2	**Discuss** different societal issues that related with the individual as a member of multi-cultural teams.
PLO10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**CLO3**	**Practice** self, learning strategies in different societal issues
		CLO4	**Evaluate** competing societal scientific theories regarding the origins of societal problems using lifelong and other learning strategies.

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Introduction in social issues.	1			√	
issues of overpopulation in Egypt and its impact on the individual and society	2,3	√		√	
issues of combatting venality and its impact on economic rights and sustainable development	4,5	√		√	
human rights issues – issues of violence against women	6	√		√	
Mid-Term Exam	7				
public health issues	8		√		√
environmental pollution and desertification	9,10		√		√
Climate change	11,12		√		√
water and energy issues	13		√		√
Other important issues in our society.	14				√
Practical Exam	**15**				
Final Exam	**16**				
Total		**5**	**6**	**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**
Lecture	√	√		
Report	√	√		
Self Learning			√	√
Hybrid Learning			√	√
Teaching and Learning Methods for Students with Special Needs:				
Methods				

1. Discussion Session	
2. Extra Lectures	
3. Provide different levels of books and materials	

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	The weighting of Assessment
Midterm Exam	7	30
Report	13	15
Presentations	13	15
Final exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of References:

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

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board
Library Usage

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
PLO7	√	√		
PLO10			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO7	PO3	CLO1	• Report	• Presentation, Report
		CLO2	• Report	• Presentation, Report
PLO10	PO5	CLO3	• Hybrid Learning • Self - Learning	• Midterm Exam • Final Exams • Report
		CLO4	• Hybrid Learning • Self - Learning	• Final Exams • Report

Course Coordinator: Dr. Goda Elsayed Goda Elsayed

Head of Department: Prof: Tarek M. Abdolkader Tarek abdelkader
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 Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Production Engineering		Code	MEC 012	
Pre-requisite Course Title	…….		Code	……..	
Type	Compulsory ☒		Elective ☐		
Semester	Level 0-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	1	0	3	4

2. Professional Information:

2.1. Course description:

Introduction, Types of industries, Casting processes: Main steps of sand casting, Pattern design, melting of metals, Cleaning and inspection of casting, Metal forming processes: Forging, Rolling, Extrusion, Drawing, Bending, Joining Processes: Temporary and permanent joints, welding techniques, Cutting Processes: Principles and elements of cutting processes, Basic cutting, and machining (Turning, Drilling, Milling, etc.,). Principles of production planning and control, Introduction to quality control.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	Evaluate the equipment and methods for deformation and cutting processes of material , to help in production engineering skills
PO6	Design of constructions that meet specified needs with appropriate attention to health	**CO2**	Classify the Principles of production planning and 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**	Apply knowledge of, engineering science to evaluation of equipment and methods for production of products.
		CLO2	Identify the selection of equipment and methods for production of

			products.
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO3**	Use engineering fundamentals and analyses to the planning, selection, and utilization of production equipment and quality control.
		CLO4	Select the most cost-effective manner to produce the intended quality

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Introduction, Casting processes	1		√		
Forging	2	√	√		
Rolling,	3	√	√		
Extrusion	4	√	√		
Drawing	5	√	√		
Bending Processes	6	√	√		
Med-Term exam	7				
Temporary and permanent joints	8	√	√		
welding techniques	9	√	√		
cutting techniques	10	√	√		
Production planning and control principles	11,12			√	√
Fundamentals of quality control	13,14			√	√
Experimental test	**15**				
Final exam	**16**				
Total		**8**	**9**	**4**	**4**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Practicing the workshop measuring operations and tools	1	√	√		
Practicing the forging workshop	2	√	√		
Metal forming workshop; rolling, bending, drawing	3,6	√	√		
Machining workshop; turning, shaping, drilling, milling	8	√	√		
Welding workshop; electric arc welding, gas welding	9	√	√		
Practicing the sand-casting workshop	10	√	√		
Practicing the carpentry workshop	11	√	√		
Total		**8**	**8**		

2.6 Teaching and Learning Methods

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

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	oral	√	√	√	√
	Experimental	√	√		
	Midterm Exam	√	√		
mini-projects				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment method		Week	Weighting of asses.
Test	Oral Test	15	10
	Experimental Test	15	10
	Mid-term exam	7	30
Mini-project		15	10
Final written exam		Scheduled by the faculty council	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
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
PLO4	√	√		
PLO6			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO4	PO4	CLO1	Lecture	Midterm exam Final exam
			Practical based learning	Oral test Experimental Test
		CLO2	Lecture	Midterm exam Final exam
			Practical based learning	Oral test Experimental Test
PLO6	PO6	CLO3	Lecture	Final exam
			Project based learning	Mini-projects Oral test
		CLO4	Lecture	Final exam
			Project based learning	Mini-projects Oral test

Course Coordinator: Prof Saleh Kaytbay

Head of Department: Prof: Tarek M. Abdolkader

Tarek abdelkader

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 Aided Drafting	**Code**	MEC 014		
Pre-requisite Course Title	Engineering Graphics	**Code**	MEC 011		
Type	Compulsory ☒	Elective ☐			
Semester	Level 0-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	1	0	2	3

2. Professional Information:

2.1. Course Description:

Introduction to Computer Aided Drafting, history, advantages, and limitation. Graphics/CAD involves the visualization, sketching, and geometric construction of mechanical components. Layout and creation 2D working industrial drawings that adhere to industry standards. Illustrate CAD drawing construction techniques, implementation of graphical communication through the use of the alphabet of lines, orthographic projection, section views, auxiliary views and the creation of assembly and detail mechanical components

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO 4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO 1**	create accurate and detailed engineering drawings using software

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**	Identify the capabilities of computer-aided drawing techniques
		CLO2	Apply basic CAD concepts to develop and construct accurate 2D geometry through the creation of basic geometric constructions.

PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO3**	Communicate graphically with the colleagues in the lab.

2.4. Course Topics:

L.T

2.5 Lab Topics

Lab Topics	**Week**	**Course LO's Covered**		
		CLO1	**CLO2**	**CLO3**
Introduction to Computer Aided Drawing	1	√		
Industry standard for drawing	2	√		
the visualization, sketching, and geometric construction of mechanical components	3-6		√	
Experimental Test	7			
Illustrate CAD drawing construction techniques	8		√	√
graphical communication using the alphabet of lines, orthographic projection, section views, auxiliary views	9-11		√	√
creation of assembly and detail mechanical components.	12-14		√	√
Practical Exam	**15**	√	√	
Final exam	**16**			
Total		**2**	**11**	**7**

2.6. Teaching and Learning Methods

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

2.7. Assessment Methods

Assessment Methods		Course LOs Covered		
		CLO 1	CLO 2	CLO 3
Formative Assessment Method				
Tests	Experimental Test	√	√	
Observation				√
Discussion		√	√	√
Assignments		√	√	
Summative Assessment Method				
Practical Exam		√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Methods		Week	Weighting of Asses.
Tests	Experimental Test	7	30
Discussion		8,14	10
Observation		8,14	5
Assignments		3,13	15
Practical Exam		15	40
Total			**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	William Chalk, Goetsch, "Technical Drawing", Delmar technical graphics series, 6th edition, 2010.
Recommended Books:	Allbert W. Boundy, "Engineering Drawing", McGraw-Hill Australia, 2012

2.8. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board
Laboratory

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective
	CO 1
PO 4	√

3.2. Course Objectives VS Course Learning Outcomes

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

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes		
	CLO 1	CLO 2	CLO 3
PLO 4	√	√	
PLO 8			√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 4	PO 4	CLO 1	• Lecture • Computer-based Instruction	• discussion • Experimental test • Assignments • Practical Exam
		CLO2	• Lecture • Computer-based Instruction	• discussion • Experimental test • Assignments • Practical Exam
PLO 8		CLO 3	• Lecture • Interactive Learning	• discussion • observation

Course Coordinator: Ahmed saeed

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 II	**Code**	BES 012		
Pre-requisite Course Title	Mathematics I	**Code**	BES 011		
Type	Compulsory ☒	Elective ☐			
Semester	Level 0-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	0	4

2. Professional Information:

2.1. Course description:

Integral Calculus: Indefinite integrals with applications. Methods of integration. Definite integrals with applications (areas, volumes of revolution, lengths of curves and surface area).

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

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.
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 a suitable item to evaluate applied engineering problems according to engineering ethics and standards.

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
PLO3	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
Indefinite integrals with applications	**1&2**	√	√		
Methods of integration	**3&4**		√		√
Definite integrals with applications	**5**	√			
Areas and volumes of revolution, lengths of curves and surface area	**6**	√	√		√
Midterm Exam	**7**				
Areas and volumes of revolution, lengths of curves and surface area	**8**	√	√		√
Surfaces and curves in three dimensions	**9**	√		√	√
Vector functions of one variable	**10**	√		√	√
Scalar functions of several variables, partial derivatives	**11**		√	√	
Directional derivatives, total derivatives	**12**		√	√	
Tangent planes and normal lines	**13**		√	√	
Taylor expansions, maxima and minima, Lagrange's multipliers	**14**	√			√
Practical Exam	**15**				
Final Exam	**16**	√		√	
Total		**6**	**6**	**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
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	7	30
Discussion	3,6,9,11	15
Quizzes	4,7,12	15
Final Exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Howard Anton, "Calculus with analytical geometry", John Wiley & Sons, Last Edition.
	George B. Thomas, Jr., Maurice D. Weir, Joel Hass, THOMAS' CALCULUS Multivariable (Twelfth Edition), 2010.
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
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
PLO1	√	√		
PLO3			√	√

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	PO3	CLO 3	Lecture Tutorials	Final Exam Quizzes
		CLO4	Tutorials Problem-based Learning	Midterm Exam, Quizzes Discussion

Course Coordinator: Ass Prof. Dr. Doaa Ahmed Abd-Elwahab

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 II		**Code**	BES 022	
Pre-requisite Course Title	Mechanics I		**Code**	BES 021	
Type	Compulsory ☒		Elective ☐		
Semester	Level 0-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	0	4

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). Moment of area, mass moments of inertia for single body, product of inertia and principle moments of inertia.

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 the mathematics equilibrium conditions of motion for rigid bodies under the action of various loads.
		CO2	Evaluate the principals of dynamics as a science for solving the practical problems of engineering applications.

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**	Describe the particle motion along different trajectory using different coordinate systems.
		CLO2	Apply the equilibrium conditions of motion for a particle .
		CLO3	Analyze the various types of a rigid-body planar motion.
PLO2	Develop and conduct	**CLO4**	Apply the equilibrium conditions of motion

	appropriate experimentation and/or simulation, analyse and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.		for a rigid body .
		CLO5	Determine the area and mass moment of inertia for a single body.

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Kinematics of particles (Rectilinear motion)	1	√				
curvilinear motion	2,3	√				
force and acceleration method	4	√	√			
work and energy method	5		√			
impulse and momentum method	6		√			
Mid-Term Exam	**7**					
Kinematics of Rigid bodies:(Translation, Rotation, and General plane motion)	8,9			√		
Area and mass moment of inertia	10					√
Force and acceleration method	11, 12		√		√	√
work and energy method	13		√		√	√
impulse and momentum method	14		√		√	√
Practical Exam	**15**					
Final Exam	**16**	√	√		√	√
Total		4	7	2	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**	**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
Tests	Mid- Term Exam	√	√			
	Quizzes	√	√	√		
Assignments		√		√	√	√
Summative Assessment Method						
Final Exam		√	√		√	√

2.7.1 Assessment Schedule & Grades Distribution

Assessment Methods		Week	Weighting of Asses.
Tests	Mid-term Exam	7	30
	Quizzes	6, 13	15
Assignments		5, 9, 11	15
Final exam		Scheduled by the faculty council	40
Total			**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Course Notes:	Vector Mechanics for Engineers: Dynamics, 12th Edition Ferdinand P. Beer, E. Russell Johnston, 2019
Recommended Books:	Engineering Mechanics, Dynamics, 14th Edition- Hibbeler, 2018

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Halls
White Boards
Data Show

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	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	• Lectures • Tutorials	• Midterm Exam • Assignments • Final Exam
		CLO2	• Lectures • Tutorials	• Midterm Exam • Final Exam
		CLO3	• Lectures • Tutorials	• Quizzes • Assignments
PLO2		CLO4	• Discussion	• Final Exam • Assignments
		CLO5	• Discussion	• Assignments • Final Exam

Course Coordinator: Dr. Naser Eldin Ab Elsttar

Head of Department: Prof: Tarek M. Abdolkader

Tarek abdelkader

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 II		**Code**	BES 032	
Pre-requisite Course Title	…….		**Code**	…….	
Type	Compulsory ☒		Elective ☐		
Semester	Level 0-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	1	5

2. Professional Information:

2.1. Course description:

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

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

2.3. Course Learning Outcomes (CLO's):

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 and capacitors.
		CLO3	**Evaluate** current, resistance and the magnetic field.
		CLO4	Evaluate Ampere's law and its application, the magnetic Gauss's Law, Faraday's Law and Magnetic Induction.
PLO2	Develop and conduct appropriate	**CLO5**	Analyze the results given from

	experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.		experiment.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
The electric field	**1,2**	√				√
Gauss's law	**3,4**	√				√
The electric potential	**5,6**		√			
Midterm	**7**					
The capacitance	**8**		√			√
Current and resistance	**9**			√		√
The magnetic field	**10,11**			√		√
Sources of Magnetic Field	**12**				√	
Faraday's law of induction	**13**				√	
The inductance	**14**				√	
Practical Exam	**15**					√
Final Exam	**16**	√	√	√	√	
Total		**2**	**2**	**2**	**3**	**10**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Kirchhoff's Voltage and Current Laws	2					√
Ohm's Law	3					√
Metric Bridge	4					√
Electric Field Mapping	5					√
Capacitor Charging	7					√
Capacitor Discharging	8					√
The Electric Transformer	9					√
Faraday's Law	10					√
Total						**8**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered				
	CLO1	CLO2	CLO3	CLO4	CLO5
1. Lectures	√	√	√	√	
2. Discussion	√	√	√	√	
3. Practical					√
4. 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
Formative Assessment Method						
Tests	Quiz	√		√	√	
	Midterm	√	√			
	Experimental Test					√
	Oral Test					√
Summative Assessment Method						
Final Exam		√	√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quiz	4	10
Midterm	7	30
Experimental Test	15	10
Oral Test	15	10
Final Exam	Scheduled by the faculty council	40
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, 10th Edition, 2018.
Recommended Books:	Fundamentals of physics, Halliday & Resnick, 12th Edition,2021.

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	CLO5
CO1	√	√	√	√	√

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	• Lectures • Discussion • Tutorials	• Quiz • Final Exam • Midterm
		CLO2	• Lectures • Discussion • Tutorials	• Final Exam • Midterm
		CLO3	• Lectures • Discussion • Tutorials	• Quiz • Final Exam
		CLO4	• Lectures • Discussion • Tutorials	• Quiz • Final Exam
PLO2		CLO5	• Practical based learning	• Experimental test • Oral test

Course Coordinator: Dr: Ibrahim Sayed Ahmed

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 Programming Fundamentals	**Code**	ELE 042		
Pre-requisite Course Title	……	**Code**	……		
Type	Compulsory ☒	Elective ☐			
Semester	Level 0-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	0	2	2	4

2. Professional Information:

2.1. Course description:

Computer System: Hardware, Software - Introduction to software design - evolution and comparison of programming languages - types and characteristics of translators - Program Design Process - Software Life Cycle - structured programming - Variables, Constants - Input and Output - Data Types and Representation - Simple Flow - Flow of Control (Conditioning, Iteration) - Array - Functions (Predefined - Programmer Defined) - Pointers- Strings - program maintenance & testing – documentation. Course topics are explained using a high-level language (as C, or C++).

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** fundamental programming skills and general programming concepts using a high-level language (as C, or C++).
PO2	Behave professionally and adhere to engineering ethics and standards and work to develop the profession and the community and promote sustainability principles.	**CO2**	**Present** professionally the types and characteristics of translators - Program Design Process - Software Life Cycle

2.3. Course Learning Outcomes (CLO's):

CBE/Program Learning Outcomes		Course Learning Outcomes	
PLO1	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.	**CLO 1**	**Identify** the digital world, networks, and the developments in computer hardware and software from the first generation to the present.
		CLO 2	**Explain the** data representation and work with different number systems.
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.	**CLO 3**	**Apply** a computer software to solve problems using flowcharts and a specific programming language.
		CLO 4	**Use** algorithms, flowcharts, and pseudocode to solve engineering problems.

2.4. Course Topics:
L.T

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to software design	1	√			
comparison of programming languages	2	√			
types and characteristics of translators	3	√			
Program Design Process - Software Life Cycle	4		√		
structured programming - Variables, Constants - Input and Output	5,6		√		
Experimental Test	**7**				
Data Types and Representation	8			√	√
Simple Flow - Flow of Control (Conditioning, Iteration)	9			√	√
Array - Functions (Predefined - Programmer Defined) - Pointers- Strings	10,11			√	√
program maintenance & testing	12,13				√
Documentation	14				√
Practical Exam	**15**			√	√
Final exam	**16**				
Total		**3**	**3**	**4**	**7**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
Tutorials	√	√		
Computer-based instruction			√	√
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	Experimental Test	√	√		
	Oral Test			√	√
Assignments		√	√		
Mini Projects				√	√
Summative Assessment Method					
Practical Exam				√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Oral Exam	6th,11th	10
Experimental Test	7th	30
Assignments	10th	10
Mini Projects	14th	10
Practical Exam	15th	40
Total		**100 %**

2.8. List of Reference:

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
Laboratory Usage
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO2
PO 1	√	
PO2		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
CO 1	√	√		
CO2			√	√

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 3			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 1	PO1	CLO 1	• Tutorials	• Experimental Test Assignments
		CLO 2	• Tutorials	• Experimental Test Assignments
PLO 3	PO2	CLO 3	• Computer-based instruction • Project-based learning	• Practical Exam • Mini Projects • Oral Test
		CLO 4	• Computer-based instruction • Project-based learning	• Practical Exam • Mini Projects • Oral Test

Course Coordinator: Dr. Hossam Labib Zayed
Head of Department: Prof: Tarek M. Abdolkader
Date: 10/ 9 / 2024

Hossam
Tarek abdelkader

مقررات المستوى الاول

Level 1

مقررات المستوى الاول

Level 1-1

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	Pollution and Industrial Safety	**Code**	BES 141		
Pre-requisite Course Title	General Chemistry	**Code**	BES 041		
Type	Compulsory ☒	Elective ☐			
Semester	Level 1-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	2	0	1	3

2. Professional Information:

2.1. Course description:

- Air pollution-sources and types of pollutants-Adverse effects -ozone depletion – green house effects- Acid rain and global warming -measurement and control methods.
- Water pollution- sources and types- constituents of wastewater- primary treatment: various pre-treatment methods - Advanced Treatment: chemical oxidation, precipitation, air stripping, - heavy metals removal.

Civil and Architecture Engineering students: Plan and manage construction health and safety, maintain safety issues for construction to introduce the foundations on which appropriate health and safety systems may be built. Occupation and health and safety affect all aspects of work. Legal framework for health and safety.

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 Adverse effects -ozone and global warming measurement and control methods to promote sustainability principles
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO2**	Maintain safety measures in construction and materials and assess environmental impacts of projects for engineering practice.
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**	Discuss the construction health and safety with appropriate attention applicable standards, economic, environmental, cultural, and societal considerations.

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**	Describe the primary treatment for air and water
		CLO2	Explain the sources and types of pollutants
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**	Introduce the foundations on which appropriate health and safety to systems may be built.
		CLO4	Illustrate the nature and sources of air and water pollution and advanced treatment.
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO5**	Demonstrate the general safety issues for construction
		CLO6	Discuss the legal framework for health and safety.

2.4. Course Topics:

Course Topics	Week	Course LOs Covered					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Introduction to environmental engineering.	**1,2**				√		
Primary treatment: various pre-treatment methods,	**3**	√	√		√		
Advanced waste water Treatment	**4-6**	√	√		√		
Mid-term Exam	**7**						
Occupation health and safety affect all aspects of work. Legal framework for health and safety.	**8-9**			√		√	√
Nature and sources of air pollution	**10**	√			√		
Plan and manage construction health and safety.	**11,12**			√		√	
Maintain safety issues for construction	**13-14**			√		√	
Practical Test	**15**						
Final Exam	**16**						
Total		**5**	**4**	**6**	**7**	**6**	**2**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Air sampling, Water sampling	3,4					√	
Adsorption, Precipitation	5,6					√	
Total						**4**	

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered					
	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
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	CLO5	CLO6
Formative Assessment Method							
Tests	Mid-term Exam	√	√		√		
	Experimental test					√	
Quizzes		√	√	√		√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	The weighting of Assessment %
Tests	Mid-term Exam	7	30
	Experimental test	12	20
Quizzes		**2, 6 , 9,13**	10
Final Exam		Scheduled by the faculty council	40
Total			**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Peavy, Rowe and Tchobangolous " Environmental Engineering" McGraw Hill Jeremy Colls, “Air Pollution”, second edition, by Spon Press 2012 Handbook of "Industrial Safety and Health, Trade and Technical Press Ltd. Morden, U.K.1980. S.P. Mahajan, "Pollution Control in Process Industries" Tata McGraw Hill, NewDelhi1985.
Periodicals, Web Sites, … etc:	https://doi.org/10.1161/CIRCULATIONAHA.115.015880

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
PO1	√		
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
PLO1	√	√				
PLO3			√	√		
PLO4					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	Lecture	Mid-term Exam Final Exam Quiz
		CLO2	Lecture	Mid-term Exam Final Exam Quiz
PLO3	PO4	CLO3	Lecture	Final Exam Quiz
		CLO4	Lecture	Mid-term Exam Final Exam
PLO4	PO6	CLO5	Lecture Practical-based Learning	Final Exam Quiz Experimental Test
		CLO6	Lecture	Final Exam Quiz

Course Coordinator: Bossy Samy Bossy Samy

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 Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Engineering Differential Equations	**Code**	BES 111		
Pre-requisite Course Title	Mathematics II	**Code**	BES 012		
Type	Compulsory ☒	Elective ☐			
Semester	Level 1-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	0	4

2. Professional Information:

2.1. Course Description:

Ordinary differential equations (ODEs): Classification and types of solutions of ODEs. Solution of first order ODEs - Applications of ODEs (Newtons law of cooling, electric circuits) - Solution of nth order ODEs (homogeneous and non-homogeneous) - System of first order linear differential equations - Series solution of differential equations- Laplace transforms and inverse Laplace transforms with applications - Fourier series with applications. Gamma and Beta functions

Partial Differential Equations (PDEs): Classification and types of solutions of PDEs. Applications of PDEs. Solution of linear PDEs with constant coefficients, solution of some initial-boundary value problems. Solution of PDEs by Laplace Transforms.

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**	**List and Explain** basic Theorems of Probability, and their applications in engineering life.
		CO2	**Select** a suitable item to evaluate applied probability 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	**CLO1**	**Identify** the basic items of the course.

	applying engineering fundamentals, basic science, and applied mathematics.	**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** different problems 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
Oder, Degree, Linearity, Formation, Geometric and physical applications .	1&2	√	√		
Solution of first order ODEs .	3&4	√	√		
Orthogonal trajectories. Solution of nth order ODEs (homogeneous and non-homogeneous).	5&6	√	√	√	
Mid-Term Exam	7	√	√	√	
System of first order linear differential equations.	8&9	√	√		
Fourier series with applications	10	√	√		
Gamma and Beta functions	11,12	√	√		
Solution of linear PDEs with constant coefficients.	13	√	√	√	√
Solution of PDEs by Laplace Transforms	14	√	√	√	√
Practical Exam	**15**				
Final Exam	**16**				
Total		**12**	**12**	**4**	**2**

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	√	√		
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

2.7. Assessment Methods

Assessment Methods		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Mid-Term Exam	√	√	√	
	Quizzes	√	√		
Discussions				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Methods		Week	Weighting of Asses.
Tests	Mid-Term Exam	7	30
	Quizzes	6,9	20
Discussion		5,8,11,14	10
Final exam		Scheduled by the faculty council	40
Total			**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Tenenbaum, Morris, and Harry Pollard. Ordinary differential equations: an elementary textbook for students of mathematics, engineering, and the sciences. Courier Corporation, 1985. Hsu, Sze-Bi, and Kuo-Chang Chen. Ordinary differential equations with applications. Vol. 23. World scientific, 2022.
Periodicals, Web Sites, … etc:	https://mathinsight.org/ordinary_differential_equation_introduction

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
PLO1	√	√		
PLO2			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture • Tutorials	• Mid-term exam • Final Exam • Quizzes
		CLO2	• Lecture • Tutorials	• Mid-term exam • Final Exam • Quizzes
PLO2		CLO3	• Discussions	• Mid-term exam • Final Exam • Discussions.
		CLO4	• Discussions	• Final Exam, • Discussions.

Course Coordinator: Assoc. Prof. Mohamed.A.Elsiy

Head of Department: Prof. Dr. Hala Refat

Date: 10 /9 2024

Course Specification (Study Plan 2022)

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	CAD for Civil Engineering	**Code**	CIV101		
Pre-requisite Course Title	Computer Aided Drafting	**Code**	MEC 014		
Type	Compulsory ☒	Elective ☐			
Semester	1-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	1	0	3	4

2. Professional Information:

2.1. Course description:

Application of AutoCAD Program in drawing different types of civil structures (Irrigation structures – Reinforced concrete structures – Steel structures- urban transportation systems).

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, that are necessary for engineering practice.

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**	Identify drawing commands
		CLO2	Explain modifying commands, and (orthogonal, relative, hatch, Array….) options.
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least	**CLO3**	Use AutoCAD Software to draw Irrigation structures projects

	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. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles	**CLO4**	Use AutoCAD Software to draw reinforced concrete and steel structures projects

2.4. Course Topics

L.T

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
1.Introduction.	1	√			
2.Drawing Commands	2,3	√			
3.Modifying Commends	4,5		√		
4.Dimensions, Text, Modify text.	6		√		
5.Experimental Test	**7**	√	√		
6.Dimensions, Text, Modify text.	8		√		
7.Layers, Block.	9,10		√		
8.Irrigation structures drawing.	11,12			√	
9.Reinforced concrete structures drawing	13				√
10. Steel structures drawing	14				√
Practical Exam	**15**	√	√	√	√
Final Exam	16				
Total		**2**	**6**	**2**	**2**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
Lecture	√	√		
Computer-based Instruction	√	√	√	√
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
Formative Assessment Method					
Tests	Experimental Test	√	√		
Assignment				√	√
Summative Assessment Method					
Practical Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Experimental Test	7	30
Assignment	11,14	30
Practical Exam	15	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	AutoCAD Fundamentals. (Manual).(Course Notes)
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/products/autocad/free-trial https://easyengineering.net/autocad-books/

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
	CO 1
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	√	√	√	√

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 12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO4	PO4	CLO1	• Lecture • Computer-based Instruction	• Experimental Test • Practical Exam
		CLO2	• Lecture • Computer-based Instruction	• Experimental Test • Practical Exam
PLO12		CLO3	• Computer-based Instruction	• Assignments • Practical Exam
		CLO4	• Computer-based Instruction	• Assignments • Practical Exam

Course Coordinator: Dr. Ibrahim Elazab

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

Course Specification (Study Plan 2022)

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**	CIV 111	
Pre-requisite Course Title	Mechanics II		**Code**	BES 022	
Type	Compulsory ☒		Elective ☐		
Semester	1-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	0	2	4

2. Professional Information:

2.1. Course description:

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**		√	√	
Mid-term exam	**7**				
Behavior of Engineering Materials under Static Shear forces.	**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**	√	√		√
Experimental / Oral Exam	**15**	√	√	√	
Final exam	**16**	√	√	√	√
Total		**8**	**8**	**7**	**7**

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. Practical based learning	√	√	√	
3. Hybrid 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
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 -7 and 9 - 14	10%
Mid-term exam	7	30%
Oral Test	15	10%
Experimental Test	15	10%
Final exam	Scheduled by the faculty council	40 %
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 المواد، د. عبد الوهاب محمد عوض - د. إبراهيم على واختبار 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. 3. A Textbook of Strength of Materials, Dr R.K. Bansal, LAXMI PUBLICATIONS (P) LTD, ISBN-10: 9788131808146 / ISBN-13: 978-8131808146.
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	√	√		
CO3			√	√

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 • Discussion	• Oral Test • Experimental • written Exam • Assignments
		CLO2	• Practical based learning • Discussion	• Oral Test • Experimental • written Exam • Assignments
PLO11		CLO3	• Lectures • Practical based learning • Hybrid Learning	• written Exam • Experimental • Oral Test • Assignments
		CLO4	• Lectures • Hybrid Learning	• written Exam • Assignments

Course Coordinator: Dr. Ibrahem AlShenawy

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	**Technology of Building Materials**			**Code**	CIV 113
Pre-requisite Course Title	General Chemistry			**Code**	BES 041
Type	Compulsory ☒			Elective ☐	
Semester	1-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	2	0	1	3

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	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 construction materials knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve surveying problems in real-life situations.
		CO2	**Solve** engineering problems in the process of the properties of construction materials

2.3. Course Learning Outcomes (CLO's):

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 building materials.
		CLO2	**Evaluate** of 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.

2.4. Course Topics:

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

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Cement tests (I)	**7**	√	√		√
Cement tests (II)	**9**	√	√		√
Concrete aggregates tests	**11**	√	√		√
Total		**3**	**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. Hybrid Learning			√	√
4.Discussion	√	√		

2.7 Assessment Methods

Assessment Methods:		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
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 7 & 9 to 14**	10%
Midterm Exam	**7**	30%
Experimental Test	**15**	10%
Oral Test	**15**	10%
Final Exam	Scheduled by the faculty council	40%
Total		**100%**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	**1-** الكود المصري لتصميم وتنفيذ المنشآت الخرسانية - 203. **2-** الكود المصري لتصميم واشتراطات تنفيذ البوليمرات المسلحة بالألياف في مجالات التشييد – 208. **3-** الملحق الأول للكود المصري لتصميم وتنفيذ المنشآت الخرسانية (دليل الاختبارات المعملية 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. **3-** "خواص واخت ار المواد" الجزء امول واللاني(أ.د. ع د 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
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 learning • Discussion	• Oral Test • Experimental Test • Midterm Exam • Final Exam • Assignments
		CLO2	• Practical based learning • Discussion	• Oral Test • Experimental Test • Midterm Exam • Final exam • Assignments
PLO11		CLO3	• Lectures • Hybrid Learning	• Mid-Term exam • Final Exam • Oral Test • Assignments
		CLO4	• Lectures • Practical based learning • Hybrid Learning	• Final Exam • Experimental Test • Oral Test • Assignments

Course Coordinator: Dr. Marwa Hany Bondok

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	Structure Analysis I	**Code**	CIV 121		
Pre-requisite Course Title	Mechanics I	**Code**	BES 021		
Type	Compulsory ☒	Elective ☐			
Semester	1-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	…	4

2. Professional Information:

2.1. Course description:

Loads and reactions – Stability of structures (external and internal) – Straining actions in Statically determinate structures- Normal stresses – Shear stresses (pure shear, torsional) – 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 situation.	**CO1**	Use engineering knowledge to identify structural elements and determinacy and stability of structures
		CO2	Apply a wide spectrum of engineering with analytic to solve determinate structural problems and stress in various types of structural members.

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 structures and different types of structural elements.
		CLO2	Explain the determinacy and stability of structures
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	**CLO3**	Determine the internal forces in determinate structural elements using classical methods
		CLO4	Calculate the stresses and combined stresses in various types of structural members under different loading conditions.

	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
Loads and Reactions.	**1**	√			
Stability of structures	**2,3**	√	√		
Analysis of Determinate Beam	**4,5**			√	
Analysis of Determinate Frame	**6**			√	
Midterm Exam	**7**	√	√	√	
Analysis of Determinate Frame	**8**			√	
Analysis of Determinate Truss.	**9**			√	
Normal stresses	**10,11**				√
Shear stresses	**12,13**				√
Combined stresses.	**14**				√
Practical Exam	**15**				
Final Exam	**16**	√	√	√	√
Total		**3**	**2**	**5**	**5**

2.5. Lab Topics:

Not Applicable

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
Lecture	√	√	√	√
Tutorials	√	√	√	√
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
Formative Assessment Method					
Tests	Midterm Exam	√	√	√	
	Quizzes	√	√	√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-Term Exam	7	30 %
Quizzes	2-14	30 %
Final Exam	Scheduled by the faculty council	40%
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Theory of structures Wagih Mohamed eldakhakhni, 2020 ISBN: 0-7432-02-977-978
Recommended Books:	• Structural Analysis by Russell C. Hibbeler, Pearson, 9th Edition, 2014, ISBN-13:978-0-13-394284-2. • Kenneth M. Leet, Chia-Ming Uang, Joel T. Lanning, Anne M. Gilbert. "Fundamentals of Structural Analysis". McGraw-Hill Education, 2018. ISBN-13: 978-0073398006 • 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
Periodicals, Web Sites, … etc:	https://www.geoengineer.org/education/online-lecture-notes-on-soil-mechanics/21-normal-and-shear-stress

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO1	√	√

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 11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 1	PO1	CLO 1	• Lecture • Tutorials	• Midterm Exam • Quizzes • Final Exam
		CLO 2	• Lecture • Tutorials	• Midterm Exam • Quizzes • Final Exam
PLO 11	PO1	CLO 3	• Lecture • Tutorials	• Midterm Exam • Quizzes • Final Exam
		CLO 4	• Lecture • Tutorials	• Quizzes • Final Exam

Course Coordinator: Dr. Ahmed Youssef

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	Fluid Mechanics		**Code**	CIV 161	
Pre-requisite Course Title	Physics I		**Code**	BES 031	
Type	Compulsory ☒		Elective ☐		
Semester	1-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	2	0	1	3

2. Professional Information:

2.1. Course description:

Dimensions and Units - Fluid Properties - Fluid Statics (Pressure distribution - Pressure measurements - Forces on submerged surfaces) - Buoyancy and Floatation - Fluids in Relative Equilibrium - Fluid Kinematics (Description of Fluids motion - Continuity Equation - Velocity and Acceleration) - Fluid Dynamics (Energy Equation - Applications of Bernoulli's Equation) - Impulse-Momentum Equation - Application of the Momentum Equation - Flow in Pipes – Pipes Systems.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science and specialized skills with analytic, critical and systemic thinking to identify and solve engineering problems in real life situation	**CO1**	Solve problems in physical properties of fluid, pressure measurements, hydrostatic pressure forces on submerged surfaces, and losses in flow in pipes.
		CO2	Evaluate the fundamental laws of fluid mechanics as continuity, energy, and momentum equation.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO2	Develop and conduct appropriate experimentation and/or simulation,	**CLO1**	Solve the complex problems in Fluid mechanics.

	analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**CLO2**	Apply laboratory experiments and apply available online software packages to solve flow problems.
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**	Analyse fluid mechanics applications using Mass, Energy and Momentum equations
		CLO4	Evaluate fluid mechanic applications using laboratory experiments

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	√			
Midterm Exam	**7**				
Types of flow	**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 online software packages to solve flow problems	**14**		√		
Practical and oral exam	**15**				
Final Exam					
Total		**12**	**5**	**4**	**4**

2.5. Lab Topics:

Course 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**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lectures	√		√	
2. Tutorials	√		√	
3. Simulation		√		√
4. Practical-based Learning		√		√
5. Hybrid Learning				√
Teaching and Learning Methods for Students with Special Needs:				
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
Tests	Midterm Exam	√			
	Experimental		√		√
	Quizzes	√		√	
	Oral Test	√	√		√
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
Experimental	15	10
Midterm Exam	7	30
Mini-Project	14	5
Oral Test	15	10
Final Exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
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:	• 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 • Mechanics of Fluids, Massey B S., Van Nostrand Reinhold. 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:	Young, Munson and Okiishi's A Brief Introduction to Fluid Mechanics, 6th Edition | Wiley

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	
	CO 1	CO 2
PO1	√	√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
PLO2	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Lecture • Tutorials	• written Exam • Quizzes
		CLO2	• Practical-based Learning • Simulation	• Experimental • Oral Test • Mini-Project
PLO11		CLO3	• Lecture • Tutorials	• written Exam • Quizzes
		CLO4	• Practical-based Learning • Hybrid Learning • Simulation	• Experimental Exam • Oral Test • Mini-Project

Course Coordinator: Dr. Fahmy Salah Abdelhaleem

Head of Department: Prof. Dr. Hala Refat

Date: 10/ 9 /2024

مقررات المستوى الاول

Level 1-2

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	Professional Ethics	**Code**	UHS104		
Pre-requisite Course Title	……	**Code**	……..		
Type	Compulsory ☒	Elective ☐			
Semester	Level 1-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	2	0	0	2

2. Professional Information:

2.1. Course description:

The course offers the background necessary to discuss the core issues of professional ethics facing graduates in their field of work. The course contains the definition of the general ingredients of professional ethics, and taking into account the public interest, rules and regulations, obligation towards society, rights and duties, with a study of example from the graduate‘s field of work in each college.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	Explain knowledge on intellectual property rights and design practices that is necessary for engineering practice.
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO2**	Use mindfulness on engineering ethics to instill moral and social values and faithfulness in in academic/professional fields.

2.3. Course Learning Outcomes (CLO’s):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO4	Utilize contemporary technologies, codes	**CLO1**	Demonstrate an ethical issues in the subject matter under

	of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.		investigation or in a relevant field
		CLO2	Identify the multiple ethical interests at stake in a real-world situation or practice
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO3**	Apply knowledge of ethical values and codes to integrate, synthesize, and apply knowledge of ethical dilemmas and solutions
		CLO4	Practice research techniques about the engineer's relationship with the engineering community and towards fellow engineers

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to Engineering Ethics	**1**		√		
Ethical Issues Faced by Engineers	**2**		√		
Ethical Theories	**3,4**	√			
Risk, Safety, and Accidents	**5**	√			
Professional Rights	**6**	√			
Mid-Term Exam	**7**	√	√		
Egyptian code, The ethics of practicing the engineering profession, Engineering Codes of Ethics	**8,9**			√	
General responsibilities of the engineer towards the community	**10**			√	
The engineer's relationship with the engineering community towards fellow engineers	**11**			√	√
Intellectual property	**12**	√		√	
Responsibility of the engineer towards customers	**13**				√
Professional Practice: Business Preparation	**14**	√			√
Practical Exam	**15**				
Final Exam	**16**	√	√	√	
Total		**7**	**3**	**5**	**3**

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. Self-Learning				√
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
Formative Assessment Method					
Tests	**Mid-Term Exam**	√	√		
Report					√
Presentations					√
Discussions		√	√	√	
Summative Assessment Method					
Final Exam		√	√	√	

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	The weighting of Assessment %
Mid-Term exam	7	30
Report	14	10
Presentations	14	10
Discussions	2,12	10
Final Exam	Scheduled by the faculty council	40
Total		100**%**

2.8. List of Reference:

Course Notes:	According to lecturer
Course Notes:	Egyptian code, The ethics of practicing the engineering profession
Essential Books (Textbooks):	Engineering ethics: Concepts and cases, 6th ed. by Charles E. Harris; Michael S. Pritchard; Michael J. Rabins; Ray James; Elaine Englehardt, 2019
Recommended Books:	Engineering ethics: Real world case studies by Steve Starrett; Amy L. Lara; Carlos, 2017

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	√	
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
PLO4	√	√		
PLO5			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO4	PO4	CLO1	Lecture	Mid-Term Exam Final Exams Discussions
		CLO2		
PLO5	PO5	CLO3	Self-Learning Report	Report Presentation
		CLO4		

Course Coordinator: Ayman 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	Basic Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Numerical Analysis		**Code**	BES 112	
Pre-requisite Course Title	Differential Equations		**Code**	BES 111	
Type	Compulsory ☒		Elective ☐		
Semester	Level 1-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	0	2	4

2. Professional Information:

2.1. Course Description:

Numerical in general: Errors, norms, Numerical solution of a system of linear and nonlinear equations. matrix eigenvalues, least square method (Curve fitting), Interpolations, Numerical differentiation and integration.
Numerical ODEs and PDEs: methods for the solution of initial value problems in 1st order ODEs and higher order ODEs, Finite difference methods for boundary value problems in ODEs and initial-boundary value problems for PDEs (Elliptic and parabolic PDEs)- Lab simulations of engineering applications

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**Explain** basic Theorems of Probability, and their applications in engineering life.
		CO2	**Select** a suitable item to evaluate applied probability 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 applied 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** different problems 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
Solution of linear systems by iterative methods	**1,2**	√		√	√
Solution of nonlinear equations	**3**	√		√	√
Curve fitting (Least square method).	**4**	√			
Interpolations (Lagrange Interpolation,	**5,6**	√		√	√
Mid-Term Exam	**7**			√	√
Numerical differentiation.	**8,9**	√		√	√
Numerical integration	**10**			√	√
Solution of first-order ODEs (Euler's method, Runge–Kutta Methods).	**11**		√		
Solution of higher order ODEs.	**12**	√	√		
Lab simulations of engineering applications.	**13**	√	√		
Revision	**14**	√	√		
Practical Test	**15**				
Final Exam	**16**				
Total		**11**	**4**	**8**	**8**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Lab simulations by software's as (C++, Matlab, Python…)-	1,2			√	√
Simulating practical technical problems-	3			√	√
linear equations	5			√	√
Nonlinear structural problems	6			√	√
equations due to the fluid continuum problems	8,9			√	√
fluid flow rate calculations- Distributed wind force problems.	10			√	√
Total				**8**	**8**

2.6. Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√		
2. Discussion	√	√		
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
Formative Assessment Method					
Tests	Mid-Term Exam	√	√		
	Experimental Test			√	√
	Quizzes	√	√		
Assignment				√	√
Summative Assessment Method					
Final Exam		√	√		

2.7.1. Assessment Schedule & Grades Distribution

Assessment Methods		Week	Weighting of Asses.%
Tests	**Mid-Term exam**	7	30
	Experimental Test	15	14
	Quizzes	6,14	4
Assignments		3,5,6,8,10,11	12
Final exam		Scheduled by the faculty council	40
Total			**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	van Kan, J. J. I. M., August Segal, and Fredericus Johannes Vermolen. "Numerical methods in scientific computing." (2023). Yang, Won Y., et al. Applied numerical methods using MATLAB. John Wiley & Sons, 2020.
Recommended Books:	Epperson, James F. An introduction to numerical methods and analysis. John Wiley & Sons, 2021. Corriou, Jean-Pierre, and Jean-Pierre Corriou. Numerical Methods of Optimization. Springer International Publishing, 2021.

Periodicals, Web Sites, … etc:	https://archive.org/details/numerical-methodas-for-engineers-and-scientists https://www.youtube.com/watch?v=IOR31yN43Kg&list=PLDea8VeK4MUTOBXLpvx_WKtVrMkojEh52

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board
Laboratory

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	• Discussion • Lecture	• Mid-Term, • Final Exams. • Quizzes
		CLO2	• Discussion • Lecture	• Mid-Term, • Final Exams. • Quizzes
PLO2		CLO3	• Computer-based Instruction	• Experimental Test • Assignment
		CLO4	• Computer-based Instruction	• Experimental Test • Assignment

Course Coordinator: Assoc. Prof. Mohamed.A.Elsiy

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 Engineering Sciences Department				
Date of Specification Approval	10/9/2024				
Course Title	Water Chemistry	**Code**	BES148		
Pre-requisite Course Title	General Chemistry	**Code**	BES 041		
Type	Compulsory ☒	Elective ☐			
Semester	Level 1-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	0	2	4

2. Professional Information:

2.1. Course Description:

This course aims to provide an introduction of equilibrium chemistry principles in aquatic systems. This course is designed for engineering students who are often required to understand the composition of solutions and direction of changes during treatment or in environmental systems. By completion of the course, the student will be able to interpret and communicate results related to water quality. Therefore the course syllabus includes the following topics: equilibrium principles of acids-bases, dissolution-precipitation, titration, gas-liquid equilibrium, oxidation-reduction, complexation and water quality analysis and quality control.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Predict acid and base behavior in aquatic systems.
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO2**	Perform water quality analyses and interpret the results necessary for engineering practice.

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 applied mathematics.	**CLO1**	Discuss acid and base reactions, precipitation /dissolution and complexing
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	**CLO2**	Illustrate the carbonate buffer system, and the impact for aquatic chemistry in general
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO3**	Use the basic analytical methods in water chemistry.
		CLO4	Explain the effects of speciation on availability and toxicity of selected ions

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	**CLO2**	**CLO3**	**CLO4**
Introduction to water properties, solutes properties and natural water compositions	**1**	√			
Acids and Bases: carbonate system, log C vs pH diagrams	**2**	√			
Chemical kinetics and reaction rates	**3,4**	√			
Principles and applications for chemical equilibrium in aquatic systems	**5**		√		
Chemical reaction and chemical equilibrium, and conservation of mass	**6**		√		
Mid-Term exam	**7**				
Titration, alkalinity and acidity	**8**			√	
Gas-liquid equilibrium and effect on alkalinity	**9**		√		
Precipitation/dissolution and water softening	**10**		√		
Oxidation reduction reactions	**11,12**				√
Complexation and water quality analysis and quality control	**13,14**			√	√
Practical Exam	**15**				
Final Exam	**16**				
Total		**4**	**4**	**3**	**4**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to lab. safety rules	2		√		
Experiment 1: Water pH	3		√		
Experiment 2: Total Dissolved Solids	5		√		
Experiment 3: Electrical Conductivity	8		√		
Experiment 4: Water Hardness	9		√		
Experiment 5: Water Alkalinity	10		√		
Experiment 6: Total Suspended Solids	11		√		
Total			**8**		

2.6. Teaching and Learning Methods

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

2.7. Assessment Methods

Assessment Methods		Course LOs Covered			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Mid-Term Exam	√			
	Experimental Test		√		
	Oral Test		√		
	Quizzes	√		√	√
Observation			√		
Summative Assessment Method					
Final Exam		√		√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Methods	Week	Weighting of Asses.
Mid-Term Exam	7	30
Experimental Test	15	10
Oral Test	15	10
Quizzes	3,8,9,10,12	5
Observation	2,3,5,8-11	5
Final exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Tenenbaum, Morris, and Harry Pollard. Ordinary differential equations: an elementary textbook for students of mathematics, engineering, and the sciences. Courier Corporation, 1985. Hsu, Sze-Bi, and Kuo-Chang Chen. Ordinary differential equations with applications. Vol. 23. World scientific, 2022.
Periodicals, Web Sites, … etc:	https://mathinsight.org/ordinary_differential_equation_introduction

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	√	
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
PLO1	√			
PLO2		√		
PLO4			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture	• Mid-Term • Final Exam • Quizzes
PLO2		CLO2	• Practical-based Learning • Interactive learning	• Experimental Test • Oral Test • Observation
PLO4	PO4	CLO3	• Lecture	• Final Exam • Quizzes
		CLO4	• Lecture	• Final Exam • Quizzes

Course Coordinator: Prof. Elsayed Fouad

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**	**CIV 114**		
Pre-requisite Course Title	Technology of Building Materials	**Code**	CIV 113		
Type	Compulsory ☒	Elective ☐			
Semester	1-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	0	2	4

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	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 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** the reinforced concrete structures that meet specified needs with appropriate attention to safety risks.

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. (Evaluation)
		CLO2	**Evaluate** appropriate experiments on Non-destructive testing. (Evaluation)
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. (Creation)
		CLO4	**Determine** the properties of fresh, hardened, and Special concrete. (Creation)
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. (Creation)
		CLO6	**Assess** Durability of concrete and concrete quality. (Evaluation)

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**	√	√	√	√		
Mid-term Exam	**7**						
Properties of hardened concrete (II)	**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**	**4**	**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**		

2.6 Teaching and Learning Methods

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

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Assignments	2 - 7 , 9 - 14	10%
Midterm Exam	7	30%
Oral Test	15	10%
Experimental Test	15	10%
Final Exam	Scheduled by the faculty council	40%
Total		**100%**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	1- الكود المصري لتصميم وتنفيذ المنشآت الخرسانية - 203. 2- المواصفة القياسية الكود المصري لتصميم وتنفيذ المنشآت الخرسانية الجزء الخاص باختبارات 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- عبد الكريم عطا تكنولوجيا الخرسانة" الجزء الأول والجزء الثاني(، أ.د. أحمد العريان - أ.د.
Periodicals, Web Sites, … etc:	https://www.concrete.org https://www.cement.org

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	• Experimental Test • Oral Test
		CLO2	• Practical based learning	• Experimental Test • Oral Test
PLO11		CLO3	• Lectures • Hybrid Learning	• Written exam • Assignments • Oral Test
		CLO4	• Lectures • Practical based learning • Hybrid Learning	• Written exam • Experimental Test • Oral Test • Assignments
PLO13	PO6	CLO5	• Lectures • Hybrid Learning	• Written exam • Assignments • Oral Test
		CLO6	• Lectures • Hybrid Learning	• Written exam • Assignments • Oral Test

Course Coordinator: Dr. Marwa Hany Bondok

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	Structure Analysis II	**Code**	CIV122		
Pre-requisite Course Title	Structure Analysis I	**Code**	CIV121		
Type	Compulsory ☒	Elective ☐			
Semester	1-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	0	4

2. Professional Information:

2.1. Course Description:

Buckling of Column, Elastic deflection of determinate structures (double Integration method and virtual work method). Influence line for determinate beam- Analysis of statically indeterminate structures (Three moment equations).

2.2. Course Objectives (CO):

Program objective		Course objective	
PO1	Apply a wide spectrum of engineering knowledge, science and specialized skills with analytic, critical and systemic thinking to identify and solve engineering problems in real life situation.	**CO1**	**Apply** the principles of mathematics, science and technology in problem and solving scenarios in structural engineering.
		CO2	**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**	Students will be able to apply principles of buckling analysis using appropriate mathematical models.
		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 of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO3**	Construct influence lines for determinate beams.
		CLO4	Students will be able to evaluate statically indeterminate structures using the three-moment equations.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Influence line for determinate beam	**1,3**			√	
Elastic deflection by Double integration method to analyzing the deformation of beam	**4**		√		
	5		√		
Elastic deflection by Double integration method to analyzing the deformation of frame	**6**		√		
Midterm Exam	**7**		√	√	
Elastic deflection by Virtual work method to analyzing the deformation of beam	**8**		√		
	9		√		
Elastic deflection by Virtual work method to analyzing the deformation of frame	**10**		√		
Using the three moment equation to analyzing the indeterminate beams.	**11**				√
Using the three moment equation to analyzing the indeterminate frames.	**12**				√
Studying the buckling of columns.	**13,14**	√			
Practical Exam	**15**				
Final Exam	**16**	√	√	√	√
Total		**2**	**6**	**3**	**2**

2.5. Lab Topics:

N.A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO 1	CLO2	CLO3	CLO4
1.Lecture	√	√	√	√
2. Tutorials	√	√	√	√
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
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	**13**	**10%**
Quiz	**13**	**20%**
Midterm Exam	**7**	**30%**
Final Exam	Scheduled by the faculty council	**40%**
Total		**100%**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Aslam Kassimali , "Structural Analysis" Stamford USA: Cengage Learning, 4th Si Edition, 2011, ISBN-13: 978-0-495-29567-9 • Aslam Kassimali, "Structural Analysis", Stamford USA: Cengage Learning, 6th Si Edition, 2019, ISBN-13 : 978-1337630948
Recommended Books:	• Jack C. McCormac, "Structural Analysis Using Classical and Matrix Methods", John Wiley & Sons, Inc, 4th Edition, 2007, ISBN-13: 978-0470036082.
Periodicals, Web Sites, … etc:	https://web.mit.edu/16.20/homepage/9_Buckling/Buckling_files/module_9_with_solutions.pdf

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO1	√	
		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
CO1	√	√		
CO2			√	√

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
PLO1	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO1	PO1	CLO1	• Lecture • Tutorials	• Assignments , Quiz • Final Exam
		CLO 2	• Lecture • Tutorials	• Midterm Exam, Final Exam • Assignments, Quiz
PLO11		CLO 3	• Lecture • Tutorials	• Assignments, Quiz • Midterm Exam ,Final Exam
		CLO 4	• Lecture • Tutorials	• Assignments , Quiz • Final 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	Survey for Engineers I	**Code**	CIV 142		
Pre-requisite Course Title	Mathematics II	**Code**	BES 012		
Type	Compulsory ☒	Elective ☐			
Semester	1-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	-	2	4

2. Professional Information:

2.1. Course description:

Basics of surveying and mapping (Definitions - Units - Scales- Reconnaissance - Sketch drawing)- Distance measurement (principles - optical measurements- EDM) - Angle and direction measurement (Vertical & Horizontal angle measurements) -Traverse (Traverse computation & adjustment) - Intersection and Resection - Area & volume computation - Vertical control & Leveling (Definitions - Methods of determining relative heights - Topographic maps - Precise leveling - Trigonometric leveling).

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.	**CO 1**	Use wide sets of surveying knowledge to identify and solve surveying problems as angle, reduced level and coordinates in real-life situations.
PO 5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO 2**	Practice the experimental and surveying techniques and skills with proficiency using modern surveying instruments as level and theodolite in a work team.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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.	**CLO 1**	**Use** different survey instruments, (tap, theodolite, and level) efficiently as a member in a working group in engineering projects.
PLO 5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO 2**	**Apply** the fundamental concepts of using surveying instruments in survey and setting out.
		CLO 3	**Identify** the basic principles of a plane and topographic survey
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.	**CLO 4**	**Determine** horizontal and vertical angles, horizontal distance, and reduced level of points.
		CLO 5	**Calculate** the coordinate of the traverse, adjust it, and solve the intersection and resection problems.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Basics of surveying and mapping	**1**	√	√			
Distance measurement	**2**	√	√			
Angle and direction measurement	**3**	√			√	
Traverse (computation & adjustment)	**4 , 5**	√				√
Intersection and Resection	**6**	√				√
Midterm Exam	**7**					
Area & volume computation	**8, 9**	√				
Vertical control & Leveling	**10**	√		√	√	

Methods of determining relative heights	**11**	√		√	√	
Topographic maps	**12**	√	√	√		
Precise leveling	**13**	√		√	√	
Trigonometric leveling	**14**	√		√	√	
Practical Exam	**15**					
Final Exam	**16**					
Total		**13**	**2**	**5**	**6**	**3**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Linear surveying measurements	**1, 2**	√				
Theodolite parts and calibration	**3, 4, 5**	√				
Vertical and Horizontal angle measurements	**6, 8, 9**	√			√	
Tacheometric surveying	**10, 11**	√				
Survey levelling instruments and height determination	**12, 13, 14**	√			√	
Total		**13**			**5**	

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO 1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Lecture				√	√
Practical-based Learning	√			√	
Report		√	√		
Hybrid 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
Formative Assessment Method						
Tests	Midterm Exam				√	√
	Experimental Exam	√			√	
Reports			√	√		
Mini Projects		√			√	
Summative Assessment Method						
Final Exam			√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Midterm Exam	**7**	**30**
Reports	**5**	**3**
Mini Projects	**14**	**7**
Experimental Exam	**15**	**20**
Final Exam	Scheduled by the faculty council	**40**
Total		**100 marks**

2.8. List of Reference:

Course Notes:	According to lecturer
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 • Surveying and Geomatics Engineering, Principles, Technologies, and Applications, 2020 , ISBN 978-0-7844-8400-5
Periodicals, Web Sites, … etc:	• https://www.lawinsider.com/dictionary/survey-plan#:~:text=Survey%20Plan%20means%20the%20plan,Sample%201Sample%202 • https://0810ole6z-1105-y-https-www-webofscience-

	com.mplbci.ekb.eg/wos/woscc/full-record/WOS:000931961700049?SID=EUW1ED0D57dNJ5kJCin9AAaFD1YUc 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	
	CO 1	CO 2
PO 1	√	
PO 5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO 1	CLO 2	CLO 3	CLO 4	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 2	√				
PLO 5		√	√		
PLO 11				√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	**PO1**	**CLO1**	• Practical-based Learning	• Experimental Exam • Mini Projects
PLO5	**PO5**	**CLO2**	• Report	• Reports • Final Exam
		CLO3	• Reports	• Reports • Final Exam
PLO11	**PO1**	**CLO4**	• Lecture • Practical-based Learning • Hybrid Learning	• Midterm Exam • Experimental Exam • Mini Projects • Final Exam
		CLO5	• Lecture • Hybrid Learning	• Midterm Exam • Final Exam

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	Civil Engineering Department				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Hydraulics	**Code**	CIV 162		
Pre-requisite Course Title	Fluid Mechanics	**Code**	CIV 161		
Type	Compulsory ☒	Elective ☐			
Semester	1-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	2	0	1	3

2. Professional Information:

2.1. Course description:

Basic Principles (open channel flow) - Uniform Flow (Basic equations for steady uniform flow - Velocity and shear stress distributions in open channels) – Non-Uniform Flow (Specific energy - Hydraulics of channel bed transition) - Hydraulic Jumps – Gradually Varied Flow - Open Channel Design (Rigid boundary and erodible channel) – Dimensional analysis and Similarity (Methods of dimensional analysis - Model analysis and similarity) – Hydraulics Machinery (Pumps and Turbines) – Unsteady Flow.

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 principles of Fluid dynamics for the solution of real-life hydraulic engineering problems
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 Open Channel Dimensions and Hydraulics Machinery
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO3**	Model the Existing and Proposed Systems In Laboratory

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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.	**CLO1**	Use practical method for the difference between the various types of flow and open channel characteristics.
		CLO2	Solve practical problems of various types of flow.
PLO 9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO3**	Apply the available software to perform exercises.
		CLO4	Create models that simulate the actual flow characteristics
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.	**CLO5**	Identify the difference between gradually and rabidly varied flow and its applications
		CLO6	Analyze in quantitative terms the processes of the Hydraulics for solving civil engineering problems

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Basic Principles (open channel flow)	**1**					√	
Uniform Flow (Basic equations for steady uniform Flow)	**2**				√	√	
Uniform Flow (Velocity and shear stress distributions in open channels)	**3**	√	√		√	√	√
Non-Uniform Flow (Specific energy - Hydraulics of channel bed transition)	**4**				√	√	√
Hydraulic Jumps	**5,6**	√	√				√
Midterm Exam	**7**				√	√	√

Gradually -Varied Flow	**8,9**				√	√	√
Open Channel Design (Rigid boundary and erodible channel)	**10**			√			
Dimensional analysis and Similarity (Methods of dimensional analysis)	**11**			√		√	√
Dimensional analysis and Similarity (Model analysis and similarity)	**12**			√			√
Hydraulics Machinery (Pumps and Turbines)	**13**					√	√
Unsteady Flow	**14**						√
Practical Exam	**15**	√	√			√	√
Final Exam	**16**			√	√	√	√
Total		**2**	**2**	**3**	**5**	**8**	**10**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**					
		CLO 1	**CLO 2**	**CLO 3**	**CLO 4**	**CLO 5**	**CLO 6**
Open Channel Flow	**3**	√	√			√	
Hydraulic Jump	**5**	√	√				
Pump characteristics	**13**					√	√
Total		**2**	**2**			**2**	**1**

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. Simulation	√	√			√	√
4. Practical-based Learning	√	√			√	√
5. Hybrid Learning			√	√		
Teaching and Learning Methods for Students with Special Needs:						
1. Repeat the explanation of some of the material and tutorials.						
2. Give them specific tasks and assign 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	CLO5	CLO6
Formative Assessment Method							
Tests	Midterm Exam				√	√	√
	Experimental Test	√	√			√	√
	Oral Exam	√		√	√	√	
Mini-Project		√	√			√	√
Final Exam				√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Mini-Project	14	10
Midterm Exam	7	30
Experimental Exam	15	10
Oral Exam	15	10
Final Exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Fundamentals of Hydraulic Engineering, by Prasuhn, Alan L., Oxford University Press 1992, ISBN 978-1-61344-141-1, 978-0-19-510732-6
Recommended Books:	-Strum, W. T., (2001). Open Channels Hydraulics, McGraw-Hill Higher Education, USA. -Chow, V.T (ed.): "Handbook of Hydrology," McGraw-Hill, New York, 1964. -Novak, P., Moffat, A. I. B., Nalluri, C., Narayanan, R. (2001) Hydraulic Structures, Third Ed, Spon, London -Open Channel Hydraulics, Third Edition,2021, 1260469700 · 9781260469707
Periodicals, Web Sites, … etc:	https://www.accessengineeringlibrary.com/binary/mheaeworks/472297b9d6eba65c/d3172d82099b4e7475e94b59ea45ae8906ab2b8768854b29645441c1a0c85b71/book-summary.pdf

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
PO1	√		
PO6		√	
PO3			√

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
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
PLO 2	√	√				
PLO 9			√	√		
PLO 11					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 2	PO1	CLO 1	• Simulation • Practical-based Learning	• Oral Exam • Mini-Project • Experimental Test
		CLO 2	• Simulation • Practical-based Learning	• Oral Exam • Mini-Project • Experimental Test
PLO 9	PO3	CLO 3	• Hybrid Learning	• Oral Exam • Final Exam
		CLO 4	• Hybrid Learning	• Oral Exam • Written Exam
PLO 11	PO 6	CLO 5	• Lecture • Tutorials • Simulation • Practical-based Learning	• Oral Exam • Written Exam • Mini-Project • Experimental Test
		CLO 6	• Lecture • Tutorials • Simulation • Practical-based Learning	• Written Exam • Mini-Project • Experimental Test

Course Coordinator: Dr. Ahmed aboulfetoh

Head of Department: Prof. Dr. Hala Refat

Date: 10 / 9 /2024

مقررات المستوى الثاني

Level 2

مقررات المستوى الثاني

Level 2-1

Course Specification

1. Basic Information:

Program Title	Civil Engineering Program			
Program Offering the course	Civil Engineering Department			
	Civil Engineering Department			
Date of Specification Approval	**10/9/2024**			
Course Title	Engineering Statistics and Probability		**Code**	BES 211
Pre-requisite Course Title	……		**Code**	…..
Type	Compulsory ☒	Elective ☐		
Semester	(Level 2-1)			
Teaching Hours	**Lec.**	**Tut.**	**Lab.**	**Credit hours**
	2	0	2	3

2. Professional Information:

2.1. Course Description:

Probability: Obtaining Data - Probability models: mathematical, deterministic model. Probability theory concepts. - Discrete Distributions: Binomial and Poisson distribution. Continuous Distributions: Normal and Exponential Distribution. - Joint distributions.
Statistics and Estimation: central point theorem, Single and multiple confidence interval, Prediction interval, tolerance interval - Hypothesis testing, - Inferences on the mean and variance of Normal distribution, Inference of two samples. – Simple and multiple Linear Regression and Correlation. - Applications involving uniform, Gaussian. Markov chains - Queueing Theory - Course examples are drawn from signal processing, system reliability, data science, wireless communications, civil engineering, and mechanical engineering - Lab simulations of engineering applications.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	**List and Explain** basic Theorems of Probability, and their applications in engineering life.
		CO2	**Select** a suitable item to evaluate applied probability 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 applied 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** different problems 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**
Basic Theorems of Probability.	1,2	√	√		
Conditional Probability. Independent Events.	3	√	√		
Discrete and Continuous Random Variables. Mean and Variance of Distributions.	4	√	√		
Discrete Distributions (Binomial, Poisson and Hypergeometric Distribution)	5,6	√	√		
Mid-Term Exam	**7**	√	√		
Continuous Distributions (Normal and Exponential Distribution).	8,9	√	√		
Distributions of Several Random Variables (Discrete and Continuous Two-Dimensional Distributions).	10	√	√		
Random Sampling. Sample mean and variance.	11	√	√		
Point Estimation of Parameters. Confidence Intervals.	12,13	√	√	√	√
Testing of Hypotheses	14	√	√	√	√
Practical Exam	**15**				
Final Exam	**16**	√	√	√	√
Total		**13**	**13**	**4**	**4**

2.5. Lab Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Lab simulations by software's as (Excel)	2			√	√
Matlab	3,4			√	√
Python	5,6			√	√
Exploratory data analysis and data transformation	8			√	√
Histograms, Box and Correlation plots, Computation of means, variances, etc,	9			√	√
Simple random sampling with and without replacement-	10			√	√
Stratified random sampling- Simulating Bernoulli process and Poisson distribution -	11			√	√
Simulating Markov chains applications-Binary and sequential hypothesis testing and gambler's ruin - Gaussian Mixture Models	12			√	√
Regression models and inference- Time series forecasting and ARIMA models.	13			√	√
Total	**16**				

2.6. Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√		
2. Tutorials	√	√		
3. Discussions			√	√
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
Formative Assessment Method					
Tests	Mid-Term Exam	√	√		
	Experimental	√	√	√	√
	Quizzes	√	√		
Discussions				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Methods		Week	Weighting of Asses.%
Tests	Mid-Term **exam**	7	30
	Experimental	15	20
	Quizzes	6،9	6
Discussion		5،8،11،14	4
Final exam		Scheduled by the faculty council	40
Total			**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	R. E Walpole, R. H. Myers, "Probability and Statistics for Engineers and Scientists", Macmillan Publishing, Last Edition.
Recommended Books:	David Levine, Patricia Ramsey , Robert Smidt, "Applied Statistics for Engineers and Scientists: Using Microsoft Excel & Minitab", First Edition, 2000.
Periodicals, Web Sites, … etc:	https://archive.org/details/introductiontopr4th00mend_d6h2

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board
Laboratory

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	• Mid-Term exam, • Final Exams. • Quizzes
		CLO2	• Lecture • Tutorials	• Mid-Term exam, • Final Exam. • Quizzes
PLO2		CLO3	• Computer-based Instruction • Discussions	• Experimental Test • Discussions • Final Exam
		CLO4	• Computer-based Instruction • Discussions	• Experimental Test • Discussions • Final Exam

Course Coordinator: Assoc. Prof. Mohamed Medhat

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	Architectural Engineering	**Code**	ARC 217
Pre-requisite Course Title	CAD for Civil Engineering	**Code**	CIV 101
Type	Compulsory ☒	Elective ☐	
Semester	Level 2-1		

Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	1	0	2	3

2. Professional Information:

2.1. Course description:

The course focuses on the relation between building materials and the related adequate construction systems. Students study the basic elements of the building (roofs - floors - walls) and understand. The architectural and services elements of buildings (Function - Finishes - Building materials - Stairs - Elevators). This course provides the students with the fundamental skills and understanding the architectural drawings (Axes - Interior and exterior dimensions - Finishes tables…).

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..	**CO2**	Produce the architectural drawings of small projects in form of different architectural projections.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		**Course Learning Outcomes**	
PLO 8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO1**	Discuss effectively simple architectural drawings.
PLO9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO2**	Recognize the building components and materials of small architectural projects.
		CLO3	Generate manual architectural

			drawings for small projects through imagination and creativity.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered		
		CLO1	CLO2	CLO3
Introduction to course content	1		√	
Different types of architectural drawings	2		√	
Explain how to draw architectural plans	3	√		√
Explain how to draw architectural sections	4	√		√
Explain how to draw architectural elevations	5	√		√
Explain how to draw architectural layout	6	√		√
Midterm Exam	7		√	√
Introduction to the project	8		√	
Introduction To RC Stairs	9		√	
Flooring systems: Stones (Granite-Marble- lime/sand …)	10		√	
Wooden floor systems: (Panels – parquets-Tiles)	11		√	
Walling systems: plastering & Painting	12		√	
Dry wall systems: (Gypsum – Cement –Wooden– Engineered) partitions.	13	√	√	√
Final sketch & discussion	14	√	√	√
Practical Exam	15			
Final Exam	16	√	√	√
Total		6	9	6

2.5. Lab Topics:

N/A

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered		
	CLO1	CLO2	CLO3
Lecture	√		
Hybrid -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
Formative Assessment Method				
Tests	Midterm Exam		√	√
Assignments		√	√	√
Mini-Project			√	√
Final Exam		√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Midterm Exam	7	30
Assignments	weekly	15
Mini-Project	14	15
Final Exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Principles and Practice of Engineering by Mark McAfee, ASCE, Second Edition, 2010.
Recommended Books:	Ching, F., and Juroszek, S. (2018). Design Drawing. 3 rd ed., Hoboken, NJ: John Wiley & Sons, Inc.
	Karlen, M. and Fleming, R. (2016). Space Planning Basics. Hoboken, NJ: John Wiley & Sons, Inc.

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
	CO 1
PO 3	√

3.2. Course Objectives VS Course Learning Outcomes

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

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes		
	CLO 1	CLO 2	CLO 3
PLO 8	√		
PLO 9		√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO8	PO 3	CLO1	• Lecture	• Assignments • Final Exam
PLO9		CLO2	• Hybrid –Learning • Project-based Learning	• Written Exam • Assignments • Mini-Project
		CLO3	• Hybrid –Learning • Project-based Learning	• Written Exam • Assignments • Mini-Project

Course Coordinator: Pro.Dr.Mona Shded

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	Structure Analysis III	**Code**	CIV 221		
Pre-requisite Course Title	Structure Analysis II	**Code**	CIV 122		
Type	Compulsory ☒	Elective ☐			
Semester	2-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	**2**	**0**	**2**	**4**

2. Professional Information:

2.1. Course description:

Analysis of statically indeterminate structures:1-Force approach (Consistent deformation method), 2- Displacement approach (Slope deflection Method, Moment distribution method). Introduction to Matrix Structural Analysis for 1-D element using Stiffness method (Truss, Beam, and frame elements).

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 engineering knowledge to identify and analyze the structural problems
		CO2	**Formulate** the indeterminate structures items.

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 and the matrix structural analysis
		CLO2	Analysis of statically indeterminate structures
PLO11	Select appropriate and sustainable technologies for construction of buildings, infrastructures and water structures; using either numerical techniques or physical	**CLO3**	Solve different problems of indeterminate structures

	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**	Analyze the Matrix Structural for 1-D element using Stiffness method

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introduction to the indeterminate structures methods.	**1**	√			
Consistent deformation method	**2,3**		√	√	
Slope deflection Method	**4,5**		√	√	
Moment distribution method	**6**		√	√	
Midterm Exam	**7**	√	√	√	
Moment distribution method	**8**		√		
Introduction to Matrix Structural Analysis for 1-D element using Stiffness method	**9**	√			
Using the Stiffness method to analyzing the indeterminate trusses	**10,11**				√
Using the Stiffness method to analyzing the indeterminate Beams	**12**				√
Using the Stiffness method to analyzing the indeterminate Frames	**13,14**				√
Practical Exam	**15**				
Final Exam	**16**	√	√	√	√
Total		**2**	**5**	**5**	**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
Lecture	√	√	√	√
Tutorials	√	√	√	√
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
Formative Assessment Method					
Tests	Midterm Exam	√	√	√	
	Quizzes	√	√	√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Mid-Term Exam	8	30 %
Quizzes	2-14	30 %
Final Exam	16	40%
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Aslam Kassimali, "Structural Analysis", Cengage Learning, Fifth Edition, 2015. ISBN-13: 978-1133943891
Recommended Books:	Structural Analysis , Felix F. Udoeyo ,2020, ISBN 9781439919446
Periodicals, Web Sites, … etc:	https://engineering.purdue.edu/~aprakas/CE474/CE474-Ch5-StiffnessMethod.pdf

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO1	√	√

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 11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 1	PO1	CLO 1	• Lecture • Tutorials	• Midterm Exam • Quizzes • Final Exam
		CLO 2	• Lecture • Tutorials	• Midterm Exam • Quizzes • Final Exam
PLO 11		CLO 3	• Lecture • Tutorials	• Midterm Exam • Quizzes • Final Exam
		CLO 4	• Lecture • Tutorials	• Quizzes • Final Exam

Course Coordinator: Dr. Amr R. 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	Soil Mechanics		**Code**	CIV 231	
Pre-requisite Course Title	Properties and Testing of Materials		**Code**	CIV 111	
Type	Compulsory ☒		Elective ☐		
Semester	2-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	1	1	4

2. Professional Information:

2.1. Course description:

Introduction to Geotechnical Engineering - Definitions and Relationships - Index Properties of Soil - Soil Classification Systems (Unified – British) - Permeability and Seepage of Soil (Darcy's Law - Capillarity in Soils - Flow Net Analysis) - Stress Distribution in Soil (Point load – Uniform Load (Newmark – Fadum - Approximation)) - Shear Strength of Soil (Direct Shear Box - Triaxial– Unconfined Compression) - Lateral Earth Pressure (Active and Passive) - Soil Compaction (Standard Proctor - Modified Proctor)..

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 fundamental understanding of the nature and properties of soil and its different types and study the effect of water on its behavior in different situations, through the application of engineering principles and skills and laboratory experiments.
PO5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO2**	Evaluate the laws and engineering sciences learned through understanding the behavior of soil using self-learning

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	**CLO1**	Analyze the index properties of soils and soil classification of the different types of soils.

	data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**CLO2**	Determine the soil permeability coefficient due to variable permeability tests. and maximum dry density of soil corresponding to the optimum moisture content through compaction tests.
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO3**	Investigate on the soil shear parameters due to variable shear tests.
		CLO4	Practice research techniques for water in the soil and the flow nets.
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**	Evaluate the variable soil parameters according to the knowledge of soil properties and classifications.
		CLO6	Evaluate the lateral earth pressure and stresses on soil due to different loads.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Definitions and Relationships	1	√					
Index properties of Soil	2	√					
Index properties of Soil	3	√				√	
Permeability and Seepage	4		√		√		
Seepage through Earth Dams	5		√		√		
Stress Distribution in Soil	**6**						√
Midterm Exam	**7**						
Stress Distribution in Soil	**8**						√
Shear strength of Soil	**9**			√		√	
Shear strength of Soil	**10**			√		√	
Compaction of Soil	**11**		√				
Compaction of Soil	**12**		√				
Lateral Earth Pressure	**13**						√
Lateral Earth Pressure	**14**						√
Practical and oral exam	**15**						
Final Exam	**16**						
Total		**3**	**4**	**2**	**2**	**3**	**4**

2.5. Lab Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
Determination of water content and unit weight.	2	√					
Determination of plastic, liquid limits, and classification of soil.	3	√				√	
Constant and Falling head permeability test.	5		√				
Direct shear box test, Triaxial test, and Unconfined test.	10					√	
Determination of the maximum dry density of soil and optimum moisture content.	12		√				
Total		**2**	**2**			**2**	

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. Practical-based Learning	√	√			√	
4.Discussion	√	√				
5.Self-Learning			√	√		
Teaching and Learning Methods for Students with Special Needs:						
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
Tests	Midterm Exam	√	√			√	√
	Experimental Test	√	√			√	
	Quizzes					√	
	Oral Test	√	√	√	√		
Report				√	√		
Assignments			√				√
Summative Assessment Method							
Final Exam		√	√			√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Assignments	3,5,7,10,12	5
Quizzes	4,12	2
Experimental	15	**10**
Midterm Exam	7	30
Oral Test	15	10
Report	14	3
Final Exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
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	
	CO 1	CO 2
PO1	√	
PO5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes					
	CLO 1	CLO 2	CLO 3	CLO4	CLO5	CLO6
CO1	√	√			√	√
CO2			√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes					
	CLO 1	CLO 2	CLO 3	CLO4	CLO5	CLO6
PLO2	√	√				
PLO5			√	√		
PLO11					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Practical-based Learning • Discussion	• Experimental Test • Oral Test • written Exam
		CLO2	• Practical-based Learning • Discussion	• Experimental Test • Oral Test • written Exam • Assignment
PLO5	PO5	CLO3	• Self-Learning	• Report • Oral Test
		CLO4	Self-Learning	• Report • Oral Test
PLO11	PO1	CLO5	• Lecture • Tutorials • Practical-based Learning	• written Exam • Quiz • Assignment • Experimental Test
		CLO6	• Lecture • Tutorials	• written Exam • Assignment

Course Coordinator: Ass. Prof./ Alnos Ali 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	Survey for Engineers II	**Code**	CIV 241		
Pre-requisite Course Title	Survey for Engineers I	**Code**	CIV 142		
Type	Compulsory ☒	Elective ☐			
Semester	2-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	-	2	4

2. Professional Information:

2.1. Course description:

Basics of geodesy- Geodetic datum – Reference Ellipsoid- Geoid determination –Terrestrial Coordinate systems and associated transformations – Geodetic position computations on the reference Ellipsoid (2 D approach for horizontal control)- Geodetic position computations in Space (3 D approach) – direct Geodetic problem – Inverse Geodetic problem – (GNSS) Global Navigation Satellite System - Satellite orbits - Satellite signals – Observables - Mathematical models for positioning - Data processing - Data transformation.

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.	**CO 1**	**Solve** the problems and discuss all that related to geodetic datum and coordinate systems of the objects on the earth by applying a wide spectrum of surveying knowledge and the techniques of the point position determination.
PO 5	Master self-learning and life-long learning strategies to communicate effectively in academic/professional fields.	**CO 2**	**Apply** a self-learning strategies to communicate effectively in professional (surveying) fields

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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.	**CLO 1**	**Identify** the concepts and theories of Geodesy and Global Navigation Satellite System.
PLO 5	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO 2**	**Apply** the methods of investigation in DGNSS concepts.
		CLO 3	**Discuss** the basic principle of different coordinate systems on the ellipsoid.
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.	**CLO 4**	**Explain** the results of geodetic observations using numerical models and calculate their accuracy.
		CLO 5	**Use** suitable software to solve the problems of determining 3-D position on and near the surface of the earth

2.4. Course Topics:

Course Topics	Week	Course LO's Covered				
		CLO1	CLO2	CLO3	CLO4	CLO5
Basics of geodesy- Geoid determination	**1**	√				
Terrestrial Coordinate systems	**2**	√		√		
Geodetic position computations on the reference Ellipsoid	**3**				√	√
Geodetic position computations	**4 , 5**				√	√
direct Geodetic problem – Inverse Geodetic problem	**6**				√	√
Midterm Exam	**7**					
(GNSS) Global Navigation Satellite System	**8, 9**	√	√			
Satellite orbits - Satellite signals	**10**	√	√		√	
Mathematical models for positioning	**11, 12**		√		√	√
Data processing	**13**			√	√	√

Data transformation	**14**			√	√	√
Practical Exam	**15**					
Final Exam	**16**					
Total		**5**	**5**	**3**	**9**	**8**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**				
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Total station parts	**1,2**	√				√
Total Station software	**3,4,5**					√
Coordinates by Total Station	**6,8,9**	√				√
Lay out and setting out by Total Station	**10-14**					√
Total		**5**				**13**

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**				
	CLO 1	**CLO2**	**CLO3**	**CLO4**	**CLO5**
Lecture				√	√
Practical-based Learning	√				√
Report		√	√		
Hybrid 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**
Formative Assessment Method						
Tests	Midterm Exam				√	√
	Experimental Test	√				√
Reports			√	√		
Mini Projects		√				√
Summative Assessment Method						
Final Exam			√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Midterm Exam	7	30
Reports	3	3
Mini Projects	14	7
Experimental Test	15	20
Final Exam		40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	• Surveying and geomatics engineering, principles, technologies and applications. Surveying committee. 2022-ISBN 978-0-7844-1603-7 ISBN 978-0-7844-8422-7 (epub)
Recommended Books:	• Elementary surveying. An introduction to geomatics by Ghilani C.D., Wolf P.R., PH 2011, ISBN: 0132554348. • PRECISION SURVEYING The Principles and Geomatics Practice-JOHN OLUSEGUN OGUNDARE-2015-ISBN 978-1-119-10251-9 • Geodesy- Introduction to Geodetic Datum and Geodetic Systems-Zhiping Lu - Yunying Qu - Shubo Qiao-2014-ISBN 978-3-642-41244-8-ISBN 978-3-642-41245-5 (eBook) ENGINEERING SATELLITE-BASED NAVIGATION AND TIMING-Global Navigation Satellite Systems, Signals, and Receivers-John W. Betz-2016-ISBN: 978-1-118-61597-3
Periodicals, Web Sites, … etc:	https://desktop.arcgis.com/en/arcmap/latest/map/projections/transverse-mercator.htm

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**
PO 1	√	
PO 5		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes				
	CLO 1	CLO 2	CLO 3	CLO 4	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 2	√				
PLO 5		√	√		
PLO 11				√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO2	PO1	CLO1	• Practical-based Learning	• Experimental Test • Mini Projects
PLO5	PO5	CLO2	• Reports • Hybrid Learning	• Reports • Final Exam
PLO11	PO1	CLO3	• Reports • Hybrid Learning	• Reports • Final Exam
		CLO4	• Lecture • Hybrid Learning	• Midterm Exam • Final Exam
		CLO5	• Lecture • Practical-based Learning	• Midterm Exam • Final Exam • Experimental Test • Mini Projects

Course Coordinator: 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				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Design of R.C. Structures I	**Code**	CIV 251		
Pre-requisite Course Title	Concrete Technology Structure Analysis II	**Code**	CIV 114 CIV 122		
Type	Compulsory ☒	Elective ☐			
Semester	2-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	0	4

2. Professional Information:

2.1. Course description:

Properties of concrete materials - Ultimate limit states design method - Design of sections under pure bending moment (Rectangular, L & T - sections) - Load distribution – Design of section under shear – Design simple and continuous beams - Design of one-way and two-ways solid slabs - Design of hollow block slabs - Design of panelled beams.

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO4	Use techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	**Apply** the different types of RC design methods.
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 elements subjected to different straining actions.

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**	**Apply** the methods of design according to the standard code.

	ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.		
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO2**	**Use** the code to design of sections subjected to flexure and shear.
		CLO3	**Verify** the conditions of serviceability Limit states.
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.	**CLO4**	**Design** the different reinforcement concrete structural elements according to ECP.

2.4. Course Topics:

Course Topics	**Week**	**Course LO's Covered**			
		CLO1	**CLO2**	**CLO3**	**CLO4**
- Properties of concrete materials & Ultimate limit states design method	**1**	√			
Design of sections under pure bending moment (Rectangular, L & T - sections)	**2, 3**	√	√	√	
Load distribution	**4**				√
Design of section under shear	**5**	√	√	√	
Design simple beams	**6**		√	√	√
Midterm Exam	**7**				
Design continuous beams	**8**		√	√	√
Design of one-way and two-ways solid slabs	**9, 10**		√	√	√
Design of hollow block slabs	**11, 12**		√	√	√
Design of panelled beams	**13, 14**		√	√	√
Practical Exam	**15**				
Final Exam	**16**				
Total		**3**	**7**	**7**	**6**

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√	√	√
2. Tutorials	√	√	√	√
3. Presentation			√	√
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			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	Quizzes	√		√	√
	Midterm Exam	√	√	√	√
Assignments		√	√		√
Report				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Midterm Exam	**7**	**30%**
Assignments	Every week	**10%**
Quiz	4,6,11,12	**10%**
Report	14	**10%**
Final Exam	Scheduled by the faculty council	**40 %**
Total		**100 %**

2.7. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	• Egyptian Code for Design & Construction of Reinforced Concrete Structures – ECOP 203-2020 • Shaker Elbehary handbook.
Recommended Books:	• Design of Concrete Structures, Arthur H Nilson, D.Darwin, Charles W. Fifteenth Edition,2016. • Design of reinforced concrete structures, Mashhour Ghoneim, Mahmoud Elmihilmy, Volume I, second edition, 2012. • Design of reinforced concrete structures, Mashhour Ghoneim, Mahmoud Elmihilmy, Volume 2, Third edition, 2012. • Design of Reinforced Concrete by Jack C. McCormac, Russell H. Brown, Wiley, Fifth Edition, 2014

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	
	CO 1	CO 2
PO4	√	
PO6		√

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
PLO3	√			
PLO4		√	√	
PLO12				√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO3	PO6	CLO1	Lecture	Midterm and Final Exams.
			Tutorials	Assignments, and Quizzes
PLO4	PO4	CLO2	Lecture	Midterm and Final Exams.
			Tutorials	Assignments.
		CLO3	Lecture	Midterm and Final Exams.
			Tutorials	Quizzes
			Self-Learning	Report
			Presentation	
PLO12	PO6	CLO4	Lecture	Midterm and Final Exams.
			Tutorials	Assignments, Quizzes
			Presentation	Report

Course Coordinator: Ass. prof. Dr. Mohamad 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				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Hydrology	**Code**	CIV 261		
Pre-requisite Course Title	Hydraulics	**Code**	CIV 162		
Type	Compulsory ☒	Elective ☐			
Semester	2-1				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	2	2	1	0	3

2. Professional Information:

2.1. Course description:

Introduction to water balance and hydrological cycle – Precipitation – Evaporation – Transpiration – Infiltration – Runoff – Hydrograph – Hydrology of the Nile basin – Flood routing – Storage and reservoir operation – Groundwater hydrology (Aquifers and groundwater reservoirs – confined and unconfined flow – design of wells – Groundwater management) – Application of computer programs in hydrology such as HEC-RAS.

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**	Classify 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**	
PLO 1	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
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.	**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- Infiltration	**4**	√	√		
Hydromorphlogy	**5**	√			
Surface Runoff and Stream Flow Hydrograph	**6**	√	√		
Midterm Exam	**7**	√	√		
Soil erosion and sedimentation	**8**	√			
Flow Measurements	**9**	√	√		√
Hydrology of the Nile basin	**10**	√			
Groundwater Hydrology	**11**	√			
Constructions and design of wells;	**12,13**			√	√
Methods of Groundwater Investigations	**14**		√		√
Practical Exam	**15**				
Final Exam	**16**	√	√		√
Total		**10**	**5**	**2**	**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
1. Lectures	√	√		√
2. Tutorials		√	√	√
3. Simulation			√	√
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
Tests	Midterm Exam	√	√		√
	Quizzes	√	√	√	√
Mini Projects				√	√
Summative Assessment Method					
Final Exam		√	√		√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Quizzes	At end of each topic	10 %
Midterm Exam	7	30 %
Mini Projects	13	20 %
Final Exam	Scheduled by the faculty council	40 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
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

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	
	CO 1	CO 2
PO	√	√

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

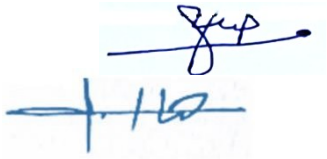
Program Learning Outcomes	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
PLO 1	√	√		
PLO 11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 1	PO1	CLO1	• Lecture	• written Exam • Quizzes
		CLO2	• Lecture • Tutorial	• written Exam • Quizzes
PLO11		CLO3	• Tutorials • Simulation	• Quizzes • Mini Projects
		CLO4	• Lecture • Tutorials • Simulation	• written Exam • Quizzes • Mini Projects

Course Coordinator: Dr. Fahmy Salah Abdelhaleem

Head of Department: Prof. Dr. Hala Refat



Date:10 / 9 /2024

مقررات المستوى الثاني

Level 2-2

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	Application I	**Code**	CIV 200		
Pre-requisite	Completion of 70 Cr. Hrs.				
Type	Compulsory ☐	Elective ☒			
Semester	Level 2-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	0	2	4

2. Professional Information:

2.1. Course description:

The main elements of structures - Construction techniques - Types of Formworks (wooden forms -metallic forms - tunnel formwork - climbing formwork - slip formwork - lift slabs system) - Formwork design, implementation and receiving - Steel reinforcement works and receiving - bricks 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**	Illustrate different types of Building Structures, precautions of execution, Steel types, usage, bending list and formworks.
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	Discuss the construction techniques and how to work in and lead 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**	Discuss Plan, supervise, and monitor the implementation of building primary works.
		CLO2	Illustrate different types of building materials, such as brick,

			Formworks 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**	Apply engineering techniques to understanding standard specification and quality control for materials of buildings.
		CLO4	Perform the steel reinforcement works and formwork .

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Introdution of Different Projects	1	√			
Introduction of the main elements of structures	2	√		√	
Civil Buildings – Construction techniques	3		√	√	
Types of Formworks (wooden forms -metallic forms)	4	√	√		
Types of Formworks (climbing formwork - tunnel formwork)	5		√		
Types of Formworks (slip formwork - lift slabs system)	6		√	√	
Midterm Exam	**7**				
Formwork design, implementation and receiving	**8**			√	√
Steel reinforcement works	**9**		√		√
Quantities and cost of Steel reinforcement works.	**10**			√	√
Steel reinforcement receiving	**11**	√			√
bricks work	**12**		√	√	
Quantities of bricks work.	**13**			√	√
bricks work receiving	**14**	√			√
Practical and oral exam	**15**	√	√	√	√
Final Exam	**16**				
Total		**5**	**6**	**7**	**6**

2.5. Lab Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Construction Techniques	3		√		√
Wooden Form works	4		√		√
Metallic Form works	5		√		√
Steel forming	10		√		√
Bricks work	12		√		√
Total			**5**		**5**

2.6 Teaching and Learning Methods

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

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Assignments	3,6,9	6
Report	10	4
Midterm Exam	7	30
Oral Test	14	20
Oral Exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Building Construction: Principle, Material & Systems by Dr Madan L Mehta, Walter Scarborough, Diane Armpriest, Pearson Second edition, 2012. Construction Technology Paperback English by Mr Roy Chudley, Roger Greeno ISBN 13 9780131286429, 2011.
Recommended Books:	Fundamentals of Building Construction: Materials and Methods, By Edward Allen, Joseph Iano, ISBN13 9781119446194
Periodicals, Web Sites, … etc:	https://www.autodesk.com/blogs/construction/building-construction-process-start-to-finish/

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	√	
PO3		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
CO1			√	√
CO2	√	√		

3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
PLO6	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	PO3	CLO1	• Lecture • Practical-based Learning	• Mid-Term Exam • Oral Test • Oral Exam
		CLO2	• Lecture • Practical-based Learning	• Mid-Term Exam • Oral Test • Oral Exam
PLO11	PO1	CLO3	• Report • Practical-based Learning • Discussion	• Report • Oral Test • Oral Exam • written Exam • Assignments
		CLO4	• Report • Practical-based Learning • Discussion	• Report • Oral Test • Oral Exam • Assignments

Course Coordinator: Dr. Mona Ibrahim Ali

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	Application II	**Code**	CIV 201		
Pre-requisite	Completion of 70 Cr. Hrs.				
Type	Compulsory ☐	Elective ☒			
Semester	2-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	0	2	4

2. Professional Information:

2.1. Course description:

Thermal insulation - Water proofing - Water supply and sanitary works - Flooring - Doors and windows - Internal and External Finishes (Plastering and Painting). 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**	Illustrate the implementation specification and engineering skills for buildings finishes.
PO3	Work in and lead a heterogeneous team and display leadership qualities, business administration, and entrepreneurial skills.	**CO2**	Discuss the construction techniques of Steel structures and how to work in and lead 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**	Discuss Plan, supervise monitor implementation of buildings finishes, and implementation of steel structures.
		CLO2	Calculate quantities and cost of materials for buildings finishes.

			Calculate quantities and cost of materials for steel.
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 engineering techniques for standard specification and quality control for materials of buildings.
		CLO4	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	√	√		
Water supply	3	√		√	
sanitary works	4	√		√	
Flooring	5		√	√	
Doors and windows	6		√	√	
Midterm Exam	**7**				
Internal and External Finishes (Plastering and Painting).	**8**	√	√	√	
Construction of Steel Structures (Layout)	**9**	√			
Construction of Steel Structures (Calculate of different loads)	**10**	√			√
Construction of Steel Structures Cutting – Drilling)	**11**		√		√
Construction of Steel Structures (Shaping)	**12**		√		√
Construction of Steel Structures (Welding - Bolts)	**13**			√	√
Construction of Steel Structures (Erection - Cladding)	**14**	√		√	√
Practical and oral exam	**15**				
Final Exam	**16**				
Total		**8**	**7**	**7**	**5**

2.5. Lab Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Plastering	3		√		√
Flooring	4		√		√
Sanitary works	5		√		√
Cutting	9		√		√
Drilling	11		√		√
Welding	13		√		√
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. Report			√	√
3. Practical-based Learning	√	√	√	√
4.Discussion			√	√
Teaching and Learning Methods for Students with Special Needs:				
Discussion Session				
Extra Lectures				
Provide different levels of books and materials				

2.7 Assessment Methods

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

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Assignments	8,10,12	6
Report	5	4
Midterm Exam	7	30
Oral Test	14	20
Oral Exam	Scheduled by the faculty council	40
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	Construction Technology Paperback English by Mr Roy Chudley, Roger Greeno ISBN 13 9780131286429, 2011.
Recommended Books:	Encyclopedia El-Bakary -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	
	CO 1	CO 2
PO1	√	
PO3		√

3.2. Course Objectives VS Course Learning Outcomes

Course Objectives	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
CO1			√	√
CO2	√	√		

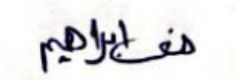
3.3. Program Learning Outcomes VS Course Learning Outcomes

Program Learning Outcomes	Course Learning Outcomes			
	CLO 1	CLO 2	CLO 3	CLO 4
PLO6	√	√		
PLO11			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO6	PO3	CLO1	• Lecture • Practical-based Learning	• Mid-Term Exam • Oral Test • Oral Exam
		CLO2	• Lecture • Practical-based Learning	• Mid-Term Exam • Oral Test • Oral Exam
PLO11	PO1	CLO3	• Report • Practical-based Learning • Discussion	• Report • Oral Test • Oral Exam • written Exam • Assignments
		CLO4	• Report • Practical-based Learning • Discussion	• Report • Oral Test • Oral Exam • Assignments

Course Coordinator: Dr. Mona Ibrahim Ali



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 Metallic Structures I		**Code**	CIV 222	
Pre-requisite Course Title	Structure Analysis II		**Code**	CIV 122	
Type	Compulsory ☒		Elective ☐		
Semester	2-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	0	4

2. Professional Information:

2.1. Course description:

Steel as a construction material - Material properties and steel sections - Allowable Stress Design method - Design of tension members - Design of compression members - Columns in braced and unbraced frames - Design of flexural members - Types and classification of beam cross sections Design of laterally supported and unsupported beams - Design of beam-columns (axial and flexural forces) - Design of 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**	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**	Design 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	**CLO1**	Use specified consideration to plan steel structures.
		CLO2	Apply different loads and structural analysis of steel structures.

	aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.		
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	**CLO3**	Utilize codes of practice and standards of steel structures to check the allowable stresses.
		CLO4	Utilize codes of practice and standards of steel structures to check safety requirements (serviceability and deflection).
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.	**CLO5**	Calculate critical straining actions for steel elements.
		CLO6	Design of steel structural elements.

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 ….(ASD)	**2**		√			√	
Design of axially loaded tension members.	**3**		√	√	√		√
Design of axially loaded compression members.	**4**		√	√	√		√
Design of flexure members -	**5**			√	√		√
Design of laterally supported beams	**6**			√	√	√	√
Midterm Exam	**7**	√	√	√	√	√	√
Design of laterally supported beams	**8**			√	√	√	√
Lateral-torsional buckling -	**9**			√	√		√

Design of laterally unsupported beams							
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**						
Final Exam	**16**	√	√	√	√	√	√
Total		**3**	**3**	**10**	**6**	**8**	**11**

2.5. Lab Topics: Not Applicable

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	Quiz			√	√		
	Midterm Exam	√	√	√	√	√	√
Assignments		√	√	√	√		
Mini-Project						√	√
Summative Assessment Method							
Final Exam		√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.%
Assignments	4&8&10&12&13	10 %
Quiz	5&9&11	10 %
Mini-Project	14	10%
Mid-term exam	7	30 %
Final exam	Scheduled by the faculty council	40 %
Total		**100 %**

2.8. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	1.Egyptian code for design of steel structure. 2.Steel structures design by Prof Dr. Abdulrahim Khalil Dessouki.
Recommended Books:	1.Steel design handbook by. Prof Dr. Bahaa M. Mashaly Part 1 2.Steel design handbook by. Prof Dr. Bahaa M. Mashaly Part 3 Advanced Steel Design Of Structures, by Prof. Srinivasan Chandrasekaran, Indian Institute of Technology, India. ISBN-13 9780367232900 , 2020 Steel Designers' Manual, By (Steel Construction Institute), Edited by Buick Davison and Graham W. Owens, ISBN-13 9781119249863 , 2016
Periodicals, Web Sites, … etc:	https://www.egr.msu.edu/~harichan/classes/ce405/chap6.pdf

2.9. Facilities required for Teaching and Learning

Different Facilities
Lecture Hall
Data Show
White Board

3. Matrix:

3.1. Program Objectives VS Course Objectives

Program Objectives	Course Objective	
	CO 1	CO 2
PO2	√	
PO6		√

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
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	CLO 6
PLO 3	√	√				
PLO 4			√	√		
PLO 12					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 3	PO 2	CLO 1	• Lecture • Tutorials	• Assignments • Written Exams
		CLO 2	• Lecture • Tutorials	• Assignments • Written Exams
PLO 4	PO 6	CLO 3	• Lecture • Tutorials	• Assignments • Written Exams
		CLO 4	• Lecture • Tutorials	• Assignments • Written Exams
PLO 12		CLO 5	• Lecture • Tutorials • Project-based Learning	• Written Exams • Mini-Project
		CLO 6	• Lecture • Tutorials • Project-based Learning	• Written Exams • Mini-Project

Course Coordinator:

Assoc. Prof. Nader Nabih Khalil Nader Nabih

Dr. Ibrahim El-Shenawy

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	Geotechnical Engineering and Foundations	**Code**	CIV 232		
Pre-requisite Course Title	Soil Mechanics	**Code**	CIV 231		
Type	Compulsory ☒	Elective ☐			
Semester	2-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	0	2	4

2. Professional Information:

2.1. Course description:

Soil Consolidation and Settlement (Soil Consolidation Theory - Primary and Secondary Settlement - Oedometer Test) - Bearing Capacity of Soil (Terzaghi Eq. - Mayerhof Eq. – Egyptian Code Eq.) - Shallow Foundations (Construction Considerations – Design Considerations) - Design of Isolated Footings (Square and Rectangular Footings – Footing with Moment) - Design of Strip Footings - Design of Combined Footings - Design of Strap Beam Footings - Design of Rafts (Conventional Method – Ribbed Raft).

2.2. Course Objectives (CO):

Program objective		**Course objective**	
PO1	Apply a wide spectrum of engineering knowledge, science, and specialized skills with analytic, critical, and systemic thinking to identify and solve engineering problems in real-life situations.	**CO1**	Evaluate the soil settlement due to compressibility resulting from different loads over time by simulating that in laboratory experiments by finding different consolidation parameters by applying engineering principles.
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 soil bearing capacity and settlement to choose an appropriate type of foundation that is appropriate to safety standards considering economic and societal factors.

2.3. Course Learning Outcomes (CLO's):

Program Learning Outcomes		Course Learning Outcomes	
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.	**CLO1**	Calculate the bearing capacity of soil for the shallow foundation.
		CLO2	Explain the construction and design considerations for shallow and deep foundations to produce cost-effective solutions.
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.	**CLO3**	Determine the soil consolidation parameters for estimating the settlement value.
		CLO4	Evaluate the soil settlement by studying the soil compressibility and compaction.
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.	**CLO5**	Design the isolated footings and strip footings.
		CLO6	Design of combined footings and strap footings and rafts.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
Soil Consolidation and Settlement	**1,3**		√	√	√		
Bearing Capacity of Soil	**4,5**	√		√			
Shallow Foundations (Construction Considerations – Design Considerations)	**6**		√				
Midterm Exam	**7**						
Design of Isolated Footings (Square and Rectangular	**8**			√		√	

Footings)							
Design of Isolated Footings (Footing with Moment)	**9**					√	
Design of Strip Footings	**10**					√	
Design of Combined Footings	**11**						√
Design of Strap Beam Footings	**12**						√
Design of Rafts	**13,14**						√
Practical Exam	**15**						
Final Exam	**16**						
Total		**2**	**2**	**5**	**2**	**3**	**4**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**					
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
One Dimensional Consolidation Test (Oedometer Test).	**1,3**			√			
SPT: Standard Penetration TeSA	**5**			√			
CPT: Cone Penetration TeSA	**8**			√			
Plate Loading TeSA	**9**			√			
Total				**5**			

2.6 Teaching and Learning Methods

Teaching and Learning Methods:	**Course LO's Covered**					
	CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
1. Lecture	√	√		√	√	√
2. Practical-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**
Formative Assessment Method							
Tests	Midterm Exam	√	√		√		
	Experimental Exam			√			
	Oral Exam			√			
	Quiz	√	√		√	√	√
Summative Assessment Method							
Final Exam		√			√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Quiz	**4&7&10&13**	**10%**
Midterm Exam	**7**	**30%**
Experimental Exam	**15**	**10%**
Oral Exam	**15**	**10%**
Final Exam	Scheduled by the faculty council	**40 %**
Total		**100 %**

2.8. List of References:

Course Notes:	According to lecturer
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., Engineering of Surface Foundations, Dar Al-Kutub Al-Almia, Cairo, 5th Ed., (19440/2015), ISBN 978 – 977 – 726 – 139 – 5, 2015. • 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.
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	
	CO 1	CO 2
PO 1	√	
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
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	CLO 6
PLO 3	√	√				
PLO 11			√	√		
PLO 12					√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO 3	PO6	CLO1	Lecture	Midterm Exam Quiz Final Exam
		CLO2	Lecture	Midterm Exam Quiz
PLO 11	PO1	CLO3	Practical-based Learning	Experimental Exam Oral Test
		CLO4	Lecture	Midterm Exam Quiz Final Exam
PLO 12	PO6	CLO5	Lecture	Quiz Final Exam
		CLO6	Lecture	Quiz Final Exam

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				
Department Offering the Course	Civil Engineering Department				
Date of Specification Approval	10/9/2024				
Course Title	Design of R.C. Structures II	**Code**	CIV 252		
Pre-requisite Course Title	Design of R.C. Structures I	**Code**	CIV 251		
Type	Compulsory ☒	Elective ☐			
Semester	2-2				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	2	0	4

2. Professional Information:

2.1. Course description:

Design of flat slabs - Design of sections subjected to bending moment and axial force - Analysis and design of columns – Design of RC frames -Design of Sections under Torsion - Serviceability limit states (deflection - crack width).

2.2. Course Objectives (CO):

Program objective		Course objective	
PO4	**Use** techniques, skills, and modern engineering tools necessary for engineering practice.	**CO1**	**Classify** the types of RC structure systems.
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 Concrete elements 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** the methods of design according to the standard code.
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO2**	**Use** the code to design of sections subjected to flexure and shear.
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**	**Verify** the conditions of serviceability Limit states.
		CLO4	**Design** the different reinforcement concrete structural elements according to ECP.

2.4. Course Topics:

Course Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Design of flat slabs	**1, 2**	√	√		√
Design of sections subjected to bending moment and axial force	**3,4**	√	√		
Analysis and design of columns	**5,6**	√	√		√
Midterm Exam	**7**	√	√		√
Design of RC frames	**8, 9**	√	√		√
Design of Sections under Torsion	**10, 11**	√	√		√
Serviceability limit states (deflection - crack width).	**12-14**	√	√	√	√
Practical Exam	**15**				
Final Exam	**16**	√	√	√	√
Total		**13**	**13**	**3**	**11**

2.5 Teaching and Learning Methods

Teaching and Learning Methods:	Course LO's Covered			
	CLO1	CLO2	CLO3	CLO4
1. Lecture	√	√	√	√
2. Tutorials	√	√	√	√
3. Presentation			√	√
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			
		CLO1	CLO2	CLO3	CLO4
Formative Assessment Method					
Tests	**Quizzes**	√		√	√
	Midterm Exam	√	√	√	√
Assignments		√	√		√
Report				√	√
Summative Assessment Method					
Final Exam		√	√	√	√

2.6.1. Assessment Schedule & Grades Distribution

Assessment Method		Week	Weighting of Asses.%
Tests	**Midterm Exam**	7	30
	Quizzes	4,6,11,12	10
Assignments		Every week	10
Report		14	10
Final Exam		Scheduled by the faculty council	40
Total			100 %

2.7. List of Reference:

Course Notes:	According to lecturer
Essential Books (Textbooks):	• Egyptian Code for Design & Construction of Reinforced Concrete Structures – ECOP 203-2020 • Shaker Elbehary handbook.
Recommended Books:	• Egyptian Code for Design & Construction of Reinforced Concrete Structures – ECOP 203-2018

	• □ Design of Concrete Structures, Arthur H Nilson, D.Darwin, Charles W. Fifteenth Edition,2016. • □ Fundamentals of Reinforcement Concrete and Prestressed concrete, M.Hilal, 1987. • □ Design of reinforced concrete structures, Mashhour Ghoneim, Mahmoud Elmihilmy, Volume 2, Third • edition, 2012. • □ Design of reinforced concrete structures, Mashhour Ghoneim, Mahmoud Elmihilmy, Volume 3, First • edition, 2011.

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	
	CO 1	CO 2
PO4	√	
PO6		√

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
PLO3	√			
PLO4		√		
PLO12			√	√

3.4. Assessment Alignment Matrix

PLO	PO	CLO	Teaching M.	Assessment M.
PLO3	**PO6**	**CLO1**	• Lecture • Tutorials	• Quizzes. • Written exam. • Assignments.
PLO4	**PO4**	**CLO2**	• Lecture • Tutorials	• Written exam. • Assignments.
PLO12		**CLO3**	• Lecture • Tutorials • Presentation • Self-Learning	• Written exam. • Quizzes. • Report
	PO6	**CLO4**	• Lecture • Tutorials • Presentation	• Written exam. • Quizzes ,Assignments. • Report

Course Coordinator: Dr. Marwa Hany Bondok. مروة هانى

Head of Department: Prof. Dr. Hala Refat

Date:10 /09 /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	Water Supply Engineering	**Code**	CIV 272		
Pre-requisite Course Title	Hydraulics	**Code**	CIV 272		
Type	Compulsory ☒	Elective ☐			
Semester	1-3				
Teaching Hours	**Credit hours**	**Contact hours**			
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	0	2	4

2. Professional Information:

2.1. Course description:

Introduction, Preliminary studies for water supply projects, sources of water, water quality and standards, design flow rates, water collection, Design of water treatment plants using conventional processes (Sedimentation - Coagulation and Flocculation - Filtration - Disinfection), water pumping and transportation works, water storage, water distribution networks.

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	**CLO1**	Analyze the different data about water characteristics, future population and water consumption
		CLO2	Discuss the different data about

	judgment to draw conclusions.		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	Plan 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**			√	
Midterm Exam	**7**				
Coagulation and Flocculation	**8**			√	
Filtration	**9,10**	√		√	
Disinfection	**11**			√	
Storage (Water Tanks)	**12**			√	√
Water Distribution	**13,14**				√
Practical exam	**15**				
Final Exam	**16**				
Total		**6**	**2**	**6**	**3**

2.5. Lab Topics:

Lab Topics	Week	Course LO's Covered			
		CLO1	CLO2	CLO3	CLO4
Turbidity, (TDS), (TSS) and (VS)	**9**	√			
Chloride, Iron and Manganese, 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
Lecture			√	√
Tutorials			√	√
Project-based Learning				√
Practical-based Learning	√	√	√	
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	√	√	√	
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	7	30 %
Mini Projects	14	3%
Quizzes	10,12	2%
Experimental Test	15	20 %
Final exam	Scheduled by the faculty council	40 %
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
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	• Midterm Exam • Assignments • Final Exam • Experimental Test
		CLO2	• Discussion • Practical -based Learning	• Midterm Exam • Assignments • Final Exam • Experimental Test
PLO12	PO6	CLO3	• Lecture • Tutorials	• Midterm Exam • Quiz • Final Exam • Assignments

			• Practical-based Learning	• Experimental Exam
		CLO4	• Lecture • Tutorials • Project-based Learning	• Midterm Exam • Quiz • Final Exam • Assignments • Mini-Project

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	Traffic and Transportation Engineering	**Code**	CIV 282	
Pre-requisite Course Title	Numerical Analysis Engineering Statistics and Probability	**Code**	BES 112 BES 211	
Type	Compulsory ☒	Elective ☐		
Semester	3-1			
Teaching Hours	**Credit hours**	**Contact hours**		
		Lect.	**Tut.**	**Lab.**	**Sum**
	3	2	0	2	4

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	Discuss 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.	**CLO3**	Calculate Human characteristics and vehicle characteristics
		CLO4	Collect traffic data
		CLO5	Analyze traffic data
		CLO6	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.	**CLO7**	Plan parking area
		CLO8	Design of traffic signal

2.4. Course Topics:

Course Topics	Week	Course LO's Covered							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO 8**
Introduction to transportation planning	**1**	√							
Travel forecast (Trip generation - Trip distribution - Modal split - traffic assignment)	**2**		√						
	3		√						
Transportation evaluation	**4**	√		√					
Human characteristics and vehicle characteristics	**5**			√	√				
Traffic data collection	**6**				√	√			
Midterm Exam	**7**								
Traffic data analyzing	**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**								
Final Exam	**16**								
Total		**2**	**2**	**2**	**2**	**2**	**2**	**2**	**3**

2.5. Lab Topics:

Lab Topics	**Week**	**Course LO's Covered**							
		CLO1	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**
Traffic data collection	**9-11**					√			
Total						**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. Report	√	√						
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			√	√	√			
	Oral Test	√	√					√	
Assignments				√	√	√	√	√	√
Report		√	√						
Summative Assessment Method									
Final Exam				√	√	√	√	√	√

2.7.1. Assessment Schedule & Grades Distribution

Assessment Method	Week	Weighting of Asses.
Oral Test	15	10
Report	15	10
Assignments	2- 12	10
Midterm exam	7	30
Final exam	Scheduled by the faculty council	40
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:	----------
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	
	CO 1	CO 2
PO5	√	
PO6		√

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			√	√	√	√	√	√

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
PLO5	√	√						
PLO13			√	√	√	√		
PLO12							√	√

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	• Lectures • Tutorials	• Final Exam • Midterm Exam • Assignments
		CLO4	• Lectures • Tutorials	• Final Exam • Midterm Exam • Assignments
		CLO5	• Lectures	• Final Exam • Midterm Exam • Assignments
		CLO6	• Lectures • Tutorials	• Final Exam • Assignments
PLO12		CLO7	• Lectures • Tutorials • Practical-based Learning	• Final Exam • Assignments • Oral Test
		CLO8	• Lectures • Tutorials	• Final Exam • Assignments

Course Coordinator: Dr /Ayman Abdulhamid

Head of Department: Prof. Dr. Hala Refat

Date:10 / 9 /2024