

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4101	Course Title: Design of reinforced concrete (5)

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4101			
Year/level	Fourth year / fifth level (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2		4

2. Course Aims	
No.	Aim
1	Teach the students how to think about and design problems and requirements using scientific methods (AM2)
2	Make the graduates continuing educations and self-learning and to qualify for an advanced scientific degree(AM5)

3. Course Learning Outcomes (LOs)	
CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
CLO24	Achieve an optimum design of Reinforced Concrete elements

4. Course Contents	
Topics	Week
Introduction to the topics	1
Design of flat slab	2

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Design of flat slab	3
Design of flat slab	4
Design of radial frames (slabs and beams)	5
Design of radial frames	6
Introduction on seismic loads on structures	7
Determination of Seismic loads	8
Mid term exam	9
Design of shear walls	10
The surface of revolution (cone)	11
The surface of revolution (dome)	12
The surface of revolution (cone + dome)	13
Final revision	14
Final exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO17	√			√			√				√	
CLO24	√			√			√					

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6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO17, CLO24
3	Quizzes	
4	Mid-term Exam	CLO17, CLO24
5	Practical Exam	
6	Final Exam	CLO17, CLO24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	weekly
2	Reports / Sheets	weekly
3	Quiz 1 / Quiz 2	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			10%	10
	Quizzes			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				

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	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

8. List of References

- [1] Reynolds, C. E., Steedman, J. C., & Threlfall, A. J. (2007). Reinforced concrete designer's handbook. CRC Press.
- [2] Darwin, D., Dolan, C. W., & Nilson, A. H. (2016). Design of concrete structures (Vol. 2). New York, NY, USA.: McGraw-Hill Education.
- [3] Wang, C. K., & Salmon, C. G. (1979). Reinforced concrete design
- [4] Shetty, M. S., & Jain, A. K. (2019). Concrete Technology (Theory and Practice), 8e. S. Chand Publishing.
- [5] Raju, N. K. (2005). Structural Design and Drawing: Reinforced Concrete and Steel. Universities Press.
- [6] Fragiadakis, M., & Papadrakakis, M. (2008). Performance-based optimum seismic design of reinforced concrete structures. Earthquake Engineering & Structural Dynamics, 37(6), 825-844.

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

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10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction to the topics	AM5	CLO17
2	Design of flat slab	AM2	CLO24
3	Design of flat slab	AM2	CLO24
4	Design of flat slab	AM2	CLO24
5	Design of radial frames (slabs and beams)	AM2	CLO24
6	Design of radial frames	AM2	CLO24
7	Introduction on seismic loads on structures	AM5	CLO17
8	Determination of Seismic loads	AM2	CLO24
9	Mid term exam	AM2,AM5	CLO17, CLO24
10	Design of shear walls	AM2	CLO24
11	The surface of revolution (cone)	AM2,AM5	CLO17, CLO24
12	The surface of revolution (dome)	AM2,AM5	CLO17, CLO24
13	The surface of revolution (cone + dome)	AM2,AM5	CLO17, CLO24
14	Final revision	AM2,AM5	CLO17,CLO24
15	Final exam	AM2,AM5	CLO17, CLO24

11. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures..	CLO24	Achieve an optimum design of Reinforced Concrete elements

Title	Name	Signature
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	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course coordinator	DR. Khaled samy abdallah	<i>Dr. Khaled Samy</i>
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	<i>Dr. A. Hamdy</i>
Head of Department	Prof. Dr. Sherif Khafaga.	<i>Sherif Khafaga</i>
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology-fifth settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4102	Course Title: Steel Structures Design (3)

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4102			
Year/level	fourth year / first Semester (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2	0	4

2. Course Aims	
No.	Aim
AM2	Teach the students to practice the methodology in thinking and describing steel structures design problems (AM2).
AM5	Make it possible for graduates to pursue continuing education in steel structures design specialty. (AM5)

3. Course Learning Outcomes (LOs)	
CLO6	Apply engineering design processes to produce cost-effective solutions for steel structures.
CLO17	Use creative, innovative, and flexible thinking to respond to new steel design situations.

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4. Course Contents

Topics	Week
Introduction to different types of steel bridges.	1
General layout for different types of steel bridges (deck, semi deck and pony)	2
Design of floor beams (stringers) and calculation of stringer loads.	3
Design of beams(stringers) as built-up sections.	4
Design of cross girders (X.G) and calculation of X.G loads.[1]	5
Design of cross girders (X.G) and calculation of X.G loads.[2]	6
Design of main girders (M.G) and calculation of M.G loads.[1]	7
midterm	8
Design of main girders (M.G) and calculation of M.G loads.[2]	9
Design of connection between steel bridges components.	10
Wind load calculation and design of bracing systems.	11
Design of bearing supports for steel bridges (roller and hinged).	12
Design splices and curtailments of sections.	13
Final exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

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CLO6	√	√	√	√	√	√	√				√	
CLO17	√	√	√	√		√	√				√	√

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO6, CLO17,
3	Quizzes	CLO6, CLO17
4	Mid-term Exam	CLO6, CLO17
5	Final Exam	CLO6, CLO17

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	---
4	Mid-term Exam	8
5	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	5%	5
	Attendance			5%	5
	Quizzes			10%	10
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				

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	Lab. Reports				
	Projects				
	practical exam				
Final Exam		60%	60		
Total		100%	100		

8. List of References

- [1] Steel Structures design and Behavior G. Salman& E. Johnson, Fifth Edition 2009.
 [2] Structural Steel Design, Jack C. McCormack, fourth Edition, 2008.
 [3] Egyptian Code of Practice ASD, LRFD, 2010.
 [4] (AISC 360-16) ,2019

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction to different types of steel bridges.	2,5	CLO6, CLO17
2	General layout for different types of steel bridges (deck, semi deck and pony)	2,5	CLO6, CLO17
3	Design of floor beams (stringers)and calculation of stringer loads.	2,5	CLO6, CLO17
4	Design of beams(stringers) as built-up sections.	2,5	CLO6, CLO17
5	Design of cross girders (X.G) and calculation of X.G loads.[1]	2,5	CLO6, CLO17
6	Design of cross girders (X.G) and calculation of X.G loads.[2]	2,5	CLO6, CLO17
7	Design of main girders (M.G) and calculation of M.G loads.[1]	2,5	CLO6, CLO17
8	Design of main girders (M.G) and calculation of M.G loads.[2]	2,5	CLO6, CLO17

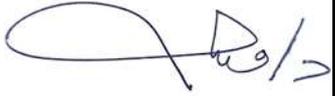
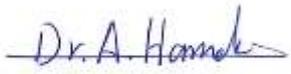
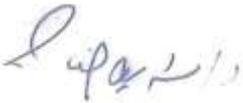
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9	Design of connection between steel bridges components.	2,5	CLO6, CLO17
10	Wind load calculation and design of bracing systems.	2,5	CLO6, CLO17
11	Design of bearing supports for steel bridges (roller and hinged).	2,5	CLO6, CLO17
12	Design splices and curtailments of sections.	2,5	CLO6, CLO17

11. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PL03	Apply engineering design processes to produce cost-effective solutions. Meet specified needs with consideration for global, cultural, social, economic, environmental, and ethical aspects. Achieve the principles of design within the principles and contexts of sustainable design and development.	CLO6	Apply engineering design processes to produce cost-effective solutions for steel structures.
PL09	Use creative, innovative, and flexible thinking to respond to new situations. Acquire entrepreneurial and leadership skills to anticipate new situations.	CLO17	Use creative, innovative, and flexible thinking to respond to new steel design situations.

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	Civil Engineering Department	

Title	Name	Signature
Course coordinator	Dr. Medhat Momtaz	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Ass.Prof. Dr. Sherif khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4103	Course Title: Foundation Engineering

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4103			
Year/level	Third year / fourth level (2 nd Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	4		8

2. Course Aims	
No.	Aim
1	Teach the students how to think about and design problems and requirements using scientific methods (AM2)
2	Make the graduates continuing educations and self-learning and to qualify for an advanced scientific degree(AM5)

3. Learning Outcomes (LOs)	
CLO3	Develop and conduct appropriate experimentation and/or simulation to draw conclusions.
CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
CLO21	Select appropriate and sustainable technologies for the construction of foundations.
CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of Soil Mechanics
CLO23	Use testing by applying a full range of civil engineering concepts and techniques.
CLO24	Achieve an optimum design of Foundations and Earth Retaining Structures.

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	Civil Engineering Department	

4. Course Contents

Topics	Week
Introduction of types of foundations	1
Design of isolated footing	2
Design of combined footing	3
Design of strap beam	4
Design of raft foundations	5
Introduction of deep foundations	6
Construction methods of piles	7
Determination of pile capacity (part 1)	8
Mid term exam	9
Determination of pile capacity (part 2)	10
Design of pile caps	11
Retaining walls constructions	12
Tunnels	13
Final revision	14
Final exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

CLO3	√			√								
CLO17	√			√			√					
CLO21	√			√			√				√	
CLO22	√			√						√		
CLO23	√			√								
CLO24	√			√							√	

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO3, CLO17, CLO21 CLO22, CLO23, CLO24
3	Quizzes	-
4	Mid-term Exam	CLO3, CLO17, CLO21
5	Practical Exam	-
6	Final Exam	CLO3, CLO17, CLO21 CLO22, CLO23, CLO24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	weekly
2	Sheets	weekly
3	Quiz	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-

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	Civil Engineering Department	

6	Final Exam	15
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7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			10%	10
	Quiz			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam				
Final Exam		60%	60		
Total		100%	100		

8. List of References
[1] Raj, P. P. (2007). Soil mechanics & foundation engineering. Pearson Education India.
[2] McCarthy, D. F., & McCarthy, D. F. (1977). Essentials of soil mechanics and foundations (p. 505). Reston: Reston Publishing Company.
[3] Abdoun, T. H. (1997). Modeling of seismically-induced lateral spreading of multi-layered soil and its effect on pile foundations. Rensselaer Polytechnic Institute.
[4] Kalinski, M. E. (2011). Soil mechanics: lab manual (No. Ed. 2). John Wiley & Sons.
[5] Fratta, D., Aguetant, J., & Roussel-Smith, L. (2007). Introduction to soil mechanics laboratory testing. CRC press.
(6) Landau, E. (2022). <i>Foundations of analysis</i> (Vol. 79). American Mathematical Society.

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9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction of types of foundations	AM2,AM5	CLO3,CLO17
2	Design of isolated footing	AM2	CLO3,CLO21,CLO22
3	Design of combined footing	AM2	CLO21,CLO22
4	Design of strap beam	AM2	CLO3,CLO21,CLO22
5	Design of raft foundations	AM2	CLO21,CLO22
6	Introduction of deep foundations	AM2,AM5	CLO3,CLO21,CLO17
7	Construction methods of piles	AM2, AM5	CLO17,CLO21,CLO22,CLO23
8	Determination of pile capacity (part 1)	AM2,AM5	CLO17,CLO21,CLO22,CLO23
9	Mid term exam	AM2,AM5	CLO3,CLO21,CLO17
10	Determination of pile capacity (part 2)	AM2,AM5	CLO17,CLO21,CLO22,CLO23
11	Design of pile caps	AM2	CLO21,CLO24
12	Retaining walls constructions	AM2,AM5	CLO17,CLO21,CLO22,CLO23
13	Tunnels	AM2,AM5	CLO17,CLO21,CLO22,CLO23
14	Final revision	AM2, AM5	CLO3,CLO17,CLO21,CLO22,CLO23,CLO24
15	Final exam	AM2,AM5	CLO3,CLO17,CLO21,CLO22,CLO23,CLO24

11. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
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	Develop and conduct appropriate experimentation to draw conclusions.
PLO9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
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.	CLO21,CLO22,CLO23	Select appropriate and sustainable technologies for the construction of foundations. Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of Soil Mechanics Use testing by applying a full range of civil engineering concepts and techniques.
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining	CLO24	Achieve an optimum design of foundations and earth-retaining structures

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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.		
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Title	Name	Signature
Course coordinator	DR. Kamal Hafez	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification Course Code: CVE4161 Course Title: Special Concrete Types

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4161			
Year/level	Fourth year / Fifth level			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	4

2. Course Aims	
No.	Aim
1	Teach the students to practice the methodology in thinking and describing concrete structures design problems (AM2).
2	Providing students with academic and technical skills to design and implement civil engineering projects by utilizing modern technologies through proper planning and participatory work.(AM3)
3	Make it possible for graduates to pursue continuing education in concrete structures design specialty. (AM5)

3. Learning Outcomes (LOs)	
CLO3	Develop and conduct appropriate experimentation and/or simulation to draw conclusions.
CLO4	analyze and interpret data, assess by using statistical analyses to draw conclusions.
CLO5	evaluate findings and use statistical analyses and objective engineering judgment.
CLO12	Practice research techniques and methods of investigation as an inherent part of learning.
CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams.

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CLO22	Use testing by applying a full range of civil engineering concepts and techniques.
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4. Course Contents

Topics	Week
Introduction in special types of concrete	1
High strength concrete, Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	2
High strength concrete, Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of	3
light and heavy weight concrete Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	4
Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of light and heavy weight concrete	5
Fiber reinforced concrete Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	6
Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of fiber reinforced concrete	7
High performance concrete Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	8
Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of high performance concrete	10
Mass concrete, Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	11
Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of mass concrete.	12

polymers concrete ,Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies	13
Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of polymers concrete	14

5. Teaching and Learning methods												
Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO3	√	√		√		√	√					√
CLO4			√		√	√	√				√	√
CLO5	√	√	√	√	√	√	√					√
CLO12	√	√	√	√		√	√				√	√
CLO15			√		√	√	√					√
CLO22								√			√	

6. Teaching and Learning methods of Disabled Students		
No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

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	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO3,CLO4,CLO5,CL O12,CLO15,CLO22
3	Quiz	-
4	Mid-term Exam	CLO3,CLO4,CLO22
5	Oral/ Practical Exam	CLO12,CLO22
6	Final Exam	CLO3,CLO4,CLO5,CL O12,CLO15,CLO22

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	weekly
3	Quizzes	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-----
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			10%	10
	Quizzes			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				

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	Civil Engineering Department	

	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

8. List of References

- [1] Mehta, P. K. (1986). Concrete. Structure, properties and materials.
- [2] Kurdowski, W. (2014). Cement and concrete chemistry. Springer Science & Business.
- [3] Mehta, P. K., & Monteiro, P. J. (2014). Concrete: microstructure, properties, and materials. McGraw-Hill Education
- [4] Khalaf, M. A., Ban, C. C., & Ramli, M. (2019). The constituents, properties and application of heavyweight concrete: A review. Construction and building materials, .215, 73-89

9. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction in special types of concrete	AM2,AM5	CLO3, CLO4,CLO12 CLO22
2	High strength concrete, Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	AM2	CLO3, CLO4, CLO22
3	High strenght concrete ,Testing, Standard specifications and codes, Properties, Practical	AM2,	CLO3, CLO4,CLO12

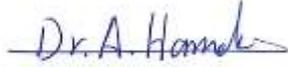
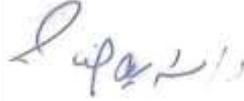
	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

	applications, Research need and related references of	AM3, AM5	CLO22,CLO15
4	light and heavy weight concrete Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	AM2, AM3	CLO3, CLO4, CLO5, CLO22,CLO15
5	Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of light and heavy weight concrete	AM2	CLO3, CLO4, CLO22
6	Fiber reinforced concrete Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	AM2, AM5	CLO3, CLO4, CLO22, CLO12
8	Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of fiber reinforced concrete	AM2, AM3	CLO3, CLO4, CLO5, CLO15
9	High performance concrete Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	AM2	CLO3, CLO4, CLO5, CLO22
10	Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of high performance concrete	AM2	CLO3, CLO4, CLO5, CLO22
11	Mass concrete , Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies.	AM2	CLO3, CLO4,CLO15, CLO22
12	Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of mass concrete.	AM2, AM3	CLO3, CLO4, CLO5, CLO15
13	polymers concrete ,Introduction and historical background, Definition and composition, Discussion of special components, Comparison with conventional concrete, Production aspects and fabrication technologies	AM2, AM5	CLO3, CLO4, CLO22, CLO12
14	Testing, Standard specifications and codes, Properties, Practical applications, Research need and related references of polymers concrete	AM2, AM3	CLO3, CLO4, CLO5, CLO15

11. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO2	Develop and conduct appropriate experiences, simulation, data analysis, interpret and evaluate results using statistical analyzes and substantive engineering rule to extract results.	CLO3	Develop and conduct appropriate experimentation and/or simulation to draw conclusions.
		CLO4	analyze and interpret data, assess by using statistical analyses to draw conclusions.
		CLO5	evaluate findings and use statistical analyses and objective engineering judgment.
PLO5	Exercise and application of scientific research techniques and methods as an integral part of learning.	CLO12	Practice research techniques and methods of investigation as an inherent part of learning.
PLO7	Work efficiently in a multidisciplinary and cultural team.	CLO17	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
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.	B1.2	Use testing by applying a full range of civil engineering concepts and techniques.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Title	Name	Signature
Course coordinator	Dr. Khaled samy	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification

Course Code: CVE 4162 Course Title: Steel structures consisting of iron plates (2)

12. Basic information

Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4162			
Year/level	Fourth year / Fifth level (1st Semester)			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	3

13. Course Aims

No.	Aim
1	Make it possible for graduates to pursue continuing education in steel structures design specialty. (AM5)
2	Design and perform experiments and analyze and interpret the results (AM7)

14. Course Learning Outcomes

CLO1	Identify steel types and its properties.
CLO6	Apply engineering design processes to produce cost-effective solutions for steel structures.
CLO17	Use creative, innovative, and flexible thinking to respond to new steel design situations.
CLO24	Achieve an optimum design of Steel Structures.
CLO31	Deal with steel project insurance and guarantees.

No of weeks	Topics
-------------	--------

1	Introduction : Steel structures consisting of iron plates
2	Orthotropic structures: Orthotropic systems, Orthotropic floors and decks
3	Behaviour and design, Construction details
4	Steel box girders: Different applications
5	Theory and behaviour, Members design
6	Connections design, Details of connections
7	Steel hollow section structures: Different applications in trusses
8	Steel hollow section structures: Different applications in Arches and vierendeels
9	Midterm exam
10	Cold formed structures: Introduction and applications
11	Theory and behaviour, Compression members, Beams, Frame elements
12	Theory and behaviour, Compression members, Walls and diaphragms, Composite decks
13	Storage structures: Tanks: Types of tanks, Analysis and design, Construction details
14	Revision
15	Final Exam

15. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

CLO1	√					√	√			√	
CLO6	√		√			√	√			√	
CLO17	√		√			√	√			√	√
CLO24			√			√	√			√	
CLO31								√			√

16. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

17. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Reports / Sheets	CLO1, CLO6, CLO17, CLO24, CLO31
3	Quiz 1 / Quiz 2	CLO1, CLO6, CLO17, CLO24
4	Mid-term Exam	CLO1, CLO6, CLO17, CLO24
5	Oral/ Practical Exam	-----
6	Final Exam	CLO1, CLO6, CLO17, CLO24, CLO31

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	----
4	Mid-term Exam	9
5	Oral/ Practical Exam	-----
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	5%	5
	Attendance			5%	5
	Quiz 1 / Quiz 2			10%	10
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

18. List of References

- [1] Steel Structures design and Behavior G. Salman& E. Johnson, Fifth Edition 2009.
 [2] Structural Steel Design, Jack C. McCormack, fourth Edition, 2008.
 [3] Egyptian Code of Practice ASD, LRFD, 2010.
 [4] (AISC 360-16) ,2019

19. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

	Ministry of Higher Education	
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20. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction : Steel structures consisting of iron plates	Aim5, Aim7	CLO1, CLO31
2	Orthotropic structures: Orthotropic systems, Orthotropic floors and decks	Aim5, Aim7	CLO1, CLO6, CLO31
3	Behaviour and design, Construction details	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
4	Steel box girders: Different applications	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
5	Theory and behaviour, Members design	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
6	Connections design, Details of connections	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
7	Steel hollow section structures: Different applications in trusses 1	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
8	Steel hollow section structures: Different applications in trusses 2	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
10	Steel hollow section structures: Different applications in Arches and vierendeels	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
11	Cold formed structures: Introduction and applications	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24, CLO31
12	Theory and behaviour, Compression members, Beams, Frame elements	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
13	Theory and behaviour, Compression members, Walls and diaphragms, Composite decks	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24, CLO31
14	Storage structures: Tanks: Types of tanks, Analysis and design, Construction details	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24, CLO31

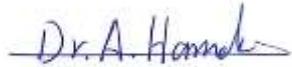
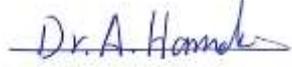
21. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Identify steel types and its properties.
PLO3	Apply engineering design processes to produce cost-effective solutions. Meet	CLO6	Apply engineering design processes to produce cost-effective solutions for steel structures.

	Ministry of Higher Education	
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	<p>specified needs with consideration for global, cultural, social, economic, environmental, and ethical aspects. Achieve the principles of design within the principles and contexts of sustainable design and development.</p>		
<p>PLO9</p>	<p>Use creative, innovative, and flexible thinking to respond to new situations. Acquire entrepreneurial and leadership skills to anticipate new situations.</p>	<p>CLO19</p>	<p>Use creative, innovative, and flexible thinking to respond to new steel design situations.</p>
<p>PLO12</p>	<p>Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures.</p>	<p>CLO24</p>	<p>Achieve an optimum design of Steel Structures.</p>
<p>PLO15</p>	<p>Deal with bidding, contract and financial issues. Deal with project insurance and guarantees.</p>	<p>CLO31</p>	<p>Deal with steel project insurance and guarantees.</p>

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Title	Name	Signature
Course coordinator	Dr. Medhat Momtaz	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Dr. Ahmed Hamdy	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4163	Course Title: Structures with load-bearing walls

22. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4163			
Year/level	fourth year / fifth level (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

23. Course Aims	
No.	Aim
AM1	Provide an engineer professional that is proficient in numerous facets of design and implementation for masonry structures.
AM2	Teach the students how to think about and describe design problems and requirements using scientific methods that ensure meeting the needs of the present and future generations in terms of social, psychological, and cultural aspects as a starting point for achieving sustainable intellectual and scientific development.
AM5	Make it possible for graduates to pursue continuing education and self-learning, and to qualify for advanced scientific degrees.

24. Learning Outcomes (LOs)	
CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals, basic science, and mathematics.
CLO5	evaluate findings and use statistical analyses and objective engineering judgment.
CLO12	Practice research techniques and methods of investigation as an inherent part of learning.
CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams.

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CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics,
CLO24	Achieve an optimum design of Masonry Structures.

1. Course Contents	
Topics	Week
Introduction: History of masonry, Masonry elements, Types of masonry construction	1
Analysis and design methods.	2
Masonry materials: Masonry units, Mortar, Grout, Reinforcement.	3
Masonry assemblages: Compression, Flexural, Shear in plane tensile strength.	4
Reinforced beams and lintels: Flexural behavior and design, Shear behavior and design, Load distribution on lintel beams.	5
Flexural walls: Load resisting mechanisms, Flexural behavior, Analysis and design of reinforced flexural walls.	6
Load bearing walls under axial load and out of plane bending: Overview	7
Effects of bending on the capacity of walls, Effect of wall height	8
Midterm exam	9
Interaction between axial load a bending,	10
Linear elastic analysis of unreinforced and reinforced sections	11
Effects of slenderness	12
Moment magnification, Special provisions for slender reinforced walls.	13
Moment magnification, Special provisions for slender reinforced walls.	14
Final Exam	15

2. Teaching and Learning methods

Course learning Outcomes

(LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO2	√	√		√								
CLO5	√	√		√								
CLO12	√	√		√								
CLO15	√	√		√								
CLO22							√			√	√	
CLO24							√			√	√	

3. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

4. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Sheets	CLO2,5,12,15,22,24
3	Quizzes	CLO2,5,12,15,22,24
4	Mid-term Exam	CLO2,5,12,15,22,24
6	Final Exam	CLO2,5,12,15,22,24

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	Bi-weekly
4	Mid-term Exam	9
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	10%	10
	Attendance			-	
	Quizzes			10%	10
	Mid-term exam			20%	20
Final Exam		60%	60		
Total		100%	100		

5. List of References
<p>[1] Klingner, R. E. (2017). Masonry structural design. McGraw-Hill Education.</p> <p>[2] Angelillo, M. (Ed.). (2014). Mechanics of masonry structures (Vol. 551). London, UK: Springer.</p> <p>[3] Hendry, A. W., Sinha, B. P., & Davies, S. R. (Eds.). (2017). Design of masonry structures. CRC Press.</p> <p>[4] Hendry, A. W., Sinha, B. P., & Davies, S. R. (Eds.). (2017). Design of masonry structures. CRC Press.</p>

6. Facilities required for teaching and learning
Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show

Laboratory Usage

7. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Introduction: History of masonry, Masonry elements, Types of masonry construction	AM1,AM2	CLO2,5,12,15,22,24
2	Analysis and design methods.	AM1,AM2	CLO2,5,12,15,22,24
3	Masonry materials: Masonry units, Mortar, Grout, Reinforcement.	AM1	CLO2,5,12,15,22,24
4	Masonry assemblages: Compression, Flexural, Shear in plane tensile strength.	AM1	CLO2,5,12,15,22,24
5	Reinforced beams and lintels: Flexural behavior and design, Shear behavior and design, Load distribution on lintel beams.	AM2	CLO2,5,12,15,22,24
6	Flexural walls: Load resisting mechanisms, Flexural behavior, Analysis and design of reinforced flexural walls.	AM2	CLO2,5,12,24
8	Load bearing walls under axial load and out of plane bending: Overview	AM2,AM5	CLO2,5,12,15,22,24
9	Midterm exam	AM1,AM2	CLO2,5,12,15,22,24
10	Interaction between axial load a bending,	AM5	CLO2,5,12,15,22,24
11	Linear elastic analysis of unreinforced and reinforced sections	AM5	CLO2,5,12,15,22,24
12	Effects of slenderness	AM5	CLO2,15,22,24
13	Moment magnification, Special provisions for slender reinforced walls.	AM1,AM5	CLO2,5,15,22,24
14	Moment magnification, Special provisions for slender reinforced walls.	AM1,AM5	CLO2,5,15,22,24

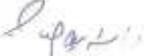
8. Matrix of Program LOs with Course Los

Program Los	Course Los
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PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
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	evaluate findings and use statistical analyses and objective engineering judgment.
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO12	Practice research techniques and methods of investigation as an inherent part of learning.
PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
PLO11	Use either numerical techniques or physical measurements 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.	CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics,
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,	CLO24	Achieve an optimum design of Masonry Structures.

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Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.		
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Title	Name	Signature
Course coordinator	Dr. Khaled samy	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Sherif Khafaga	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 5254	Course Title: Project resources management

9. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 5254			
Year/level	Fourth year / Fifth Level			(1 st Semester)
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

10. Course Aims	
No.	Aim
AM2	Teach the students how to think about and how to manage problems using scientific methods that ensure implementing a construction project with the optimal quality within the planned schedule and planned budget as a starting point for achieving sustainable development (AM2).
AM5	Make it possible for graduates to pursue continuous education and self-learning to allow keeping an eye of the lasting development in construction project management (AM5).

11. Learning Outcomes (LOs)	
CLO10	Utilize the quality guidelines, health and safety requirements, and environmental issues.
CLO11	Utilize risk management principles.
CLO13	Plan engineering projects.
CLO14	Supervise and monitor implementation of engineering projects.

12. Course Contents	
Topics	Week
Introduction	1
Construction Management Phases	2
Feasibility Studies	3
Construction Contracts	4
Target Cost Contracts	5
Bedding and Tendering	6
Planning Techniques	8
Critical Path Method – Activity on Node	9
Critical Path Method – Activity on Arrow	10
Gantt Chart	11
Resource allocation	12
Resource Leveling	13
Resource Leveling	14
Final exam.	15

13. Teaching and Learning methods													
Course learning Outcomes (LOs)	Teaching and Learning Methods												
		<table border="1" style="width: 100%; text-align: center;"> <tr> <td>Lectures (face to face / online)</td> <td>Presentation / Movies</td> <td>Discussions</td> <td>Tutorials</td> <td>Practical and lab. experiments</td> <td>Problem Solving</td> <td>Brain Storming</td> <td>Projects and Team Working</td> <td>Site Visits</td> <td>Research / Reports</td> <td>Self-learning</td> <td>Modeling and Simulation</td> </tr> </table>	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning
Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation		

CLO10	√	√		√								
CLO11	√	√		√		√						
CLO13	√	√		√			√					
CLO14	√	√		√								

14. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

15. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Sheets	CLO 10, 11,13,14
3	Quizzes	CLO11,13
4	Mid-term Exam	CLO10,11
5	Practical Exam	-----
6	Final Exam	CLO 10, 11,13,14

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	4 & 10
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			-	
	Quizzes			10%	10
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam				
Final Exam		60%	60		
Total		100%	100		

16. List of References

- [1] Goel, Ashish, L. S. Ganesh, and Arshinder Kaur. "Social sustainability considerations in construction project feasibility study: a stakeholder salience perspective." *Engineering, construction and architectural management* 27.7 (2020): 1429-1459.
- [2] Chen, Boris Po-Tsang, and Chang-Shian Chen. "Feasibility assessment of a water supply reliability index for water resources project planning and evaluation." *Water* 11.10 (2019): 1977.
- [3] Gould, Frederick E., and Nancy Nancy Eleanor Joyce, (2003), *Construction Project Management*, publisher: Pearson Prentice Hall, Third edition.
<https://lccn.loc.gov/2008007792/>
- [4] NUNNALLY and Stephens, (2007). *Construction Methods and Management*, publisher: Prentice Hall, eighth edition. <https://lccn.loc.gov/00039179/>
- [5] Keith Potts and Ankrah Nii (2014). *Construction cost management: learning from case studies*. Routledge, 2014.

17. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

18. Matrix of Course Content with Course LO's

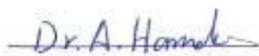
No.	Topics	Aim	Los
-----	--------	-----	-----

1	Introduction	AM2	-----
2	Construction Management Phases	AM2, AM5	CLO 11,13
3	Feasibility Studies	AM2	CLO 10, 11
4	Construction Contracts	AM2, AM5	CLO 10, 11
5	Target Cost Contracts	AM2	CLO 10
6	Bedding and Tendering	AM2, AM5	CLO 11
7	Planning Techniques	AM2, AM5	CLO 11
8	Introduction	AM2	CLO 11
9	Mid-term exam	AM2	CLO 11
10	Critical Path Method – Activity on Arrow	AM2, AM5	CLO 11,14
11	Gantt Chart	AM2, AM5	CLO 11,14
12	Resource allocation	AM2, AM5	CLO 11
13	Resource Leveling	AM2	CLO 11
14	Resource Leveling	AM2	CLO 11
15	Final exam.	AM2, AM5	CLO 10,11,13,14

19. Matrix of Program LOs with Course Los

Program Los		Course Los	
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	CLO10	Utilize the quality guidelines, health and safety requirements, and environmental issues.
		CLO11	Utilize risk management principles.
PLO6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO13	Plan engineering projects.
		CLO14	Supervise and monitor implementation of engineering projects.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Title	Name	Signature
Course coordinator	Dr. Medhat Moomtaz.	
Program Coordinator:	Asso. Dr. Ahmed Hamdy.	
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4165	Course Title: Sanitary Engineering (2)

20. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4165			
Year/level	Fourth year / First Semester (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

21. Course Aims	
No.	Aim
AM2	Teach the students scientific methods to think and solve design problems of water supply system units included in the course, the units of sewage treatment and sewerage system. (AM2).

22. Learning Outcomes (LOs)	
CLO6	Apply engineering design process in water sedimentation & filtration units, sewage treatment units and sewerage system.
CLO24	Achieve an optimum design of water sedimentation & filtration units, sewage treatment units and sewerage system.

23. Course Contents	
Topics	Week
Introduction.	1
Sewerage system.	2
Water treatment.	3

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Plain sedimentation.	4
Coagulation.	5
Clari-flocculator.	6
Filtration .	7
Primary sewage treatment	8
Secondary sewage treatment (standard rate trickling filter)	10
Secondary sewage treatment (high rate trickling filter)	11
Secondary sewage treatment (Aeration tank, Modifications of Aeration tank)	12
Sludge treatment and disposal	13
Sludge treatment and disposal	14
Final exam	15

24. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO6	√		√	√		√						
CLO24	√		√	√		√						

25. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
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	Ministry of Higher Education Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

1	Additional Tutorials	
2	Online lectures and assignments	

26. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Sheets	CLO6, 24
3	Quizzes	CLO6, 24
4	Mid-term Exam	CLO6, 24
5	Practical Exam	-----
6	Final Exam	CLO6, 24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	4 & 10
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	10%	10
	Attendance			-	
	Quiz 1 / Quiz 2			10%	10
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				

	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

27. List of References

- [1] **Khidirov, Sanatjon, et al. "Exploration of the hydraulic structure of the water supply facilities operation mode and flow." E3S Web of Conferences. Vol. 264. EDP Sciences, 2021.**
- [2] **Wang, Jiao, et al. "Disinfection technology of hospital wastes and wastewater: Suggestions for disinfection strategy during coronavirus Disease 2019 (COVID-19) pandemic in China." Environmental pollution 262 (2020): 114665.**
- [3] **Rajmohan, Kunju Vaikarar Soundararajan, et al. "Plastic pollutants: effective waste management for pollution control and abatement." Current Opinion in Environmental Science & Health 12 (2019): 72-84.**
- [4] **Water Supply Engineering, Dr.B.C punmia, B-i/10.**
- [5] **Water Supply & Waste water Engineering, A.K.Upadhya, B-i/12.**
- [6] **Water supply and pollution control 8ed, Chadik, B-i/19.**
- [7] **Water supply Engineering, P.N.Modi, B-i/22.**

28. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

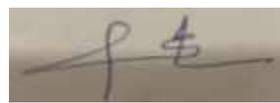
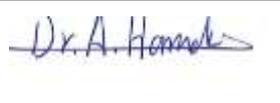
29. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Introduction about sewerage system	AM2
2	Sewerage system	AM2	CLO6, 24
3	Introduction to sedimentation process	AM2
4	Sedimentation tank	AM2	CLO6, 24
5	Coagulation process	AM2
6	Clari-flocculator	AM2	CLO6, 24
7	Filtration process & design of filters	AM2	CLO6, 24
8	Primary sewage treatment	AM2	CLO6
9	Mid-term exam	AM2	CLO6, 24
10	Secondary sewage treatment (high rate trickling filter)	AM2	CLO6, 24
11	Secondary sewage treatment (Aeration tank)	AM2	CLO6, 24
12	Secondary sewage treatment (Modifications of Aeration tank)	AM2	CLO6, 24
13	Sludge treatment and disposal	AM2	CLO6, 24
14	Sludge treatment and disposal	AM2	CLO6, 24
15	Final exam	AM2	CLO6, 24

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

30. Matrix of Program LOs with Course Los

Program Los		Course Los	
PLO3	Apply engineering design processes that meets specified needs.	CLO6	Apply engineering design process in water sedimentation & filtration units, sewage treatment units and sewerage system.
PLO12	Achieve an optimum design in Sanitary works strategies.	CLO24	Achieve an optimum design of water sedimentation & filtration units, sewage treatment units and sewerage system.

Title	Name	Signature
Course coordinator	Dr. Salma Abdel Mageed.	
Program Coordinator:	Asso. Dr. Ahmed Hamdy.	
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4166	Course Title: Water quality measurement

31. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE <u>4166</u>			
Year/level	Fourth year / Fifth level			(1 st Semester)
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

32. Course Aims	
No.	Aim
AM2	Teach the students scientific methods to think about and solve design problems of water supply system units, included in the course, to meets to present and future requirements. (AM2).

33. Learning Outcomes (LOs)	
CLO4	Analyze data of population and water consumption to draw conclusions.
CLO6	Apply engineering design process in collection, storage and Disinfection works to produce low cost solutions.
CLO10	Utilize health and safety for potable water and sewage disposal.

34. Course Contents

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Topics	Week NO.
Introduction.	1
The water used for industrial purposes.	2
The engineering know - how to produce the required water quality for every industrial use.	3
Introduction to the various types of industry, The corresponding water quality needs.	4
Water desalination.	5
Iron and manganese removal.	6
Water softening.	7
Scaling and demineralization.	8
Sedimentation	10
Chemical precipitation.	11
Water flotation, Water filtration and water aeration.	12
Water recycling and reuse in industry.	13
Water recycling and reuse in industry.	14
Final exam	15

35. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

	Ministry of Higher Education	
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	Civil Engineering Department	

CLO4	√	√	√	√		√					√	
CLO6	√	√		√							√	
CLO10				√			√				√	

36. Teaching and Learning methods of Disabled Students		
No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

37. Students' Assessment

7.1 Students' Assessment Method		
No.	Assessment Method	Los
1	Attendance	CLO4
2	Sheets	CLO6,10
3	Quizzes	-----
4	Mid-term Exam	CLO6,10
5	Practical Exam	-----
6	Final Exam	CLO4,6,10

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	-
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	20%	20
	Attendance			-	
	Quizzes				
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam				
Final Exam		60%	60		
Total		100%	100		

38. List of References

- [1] Wang, Jiao, et al. "Disinfection technology of hospital wastes and wastewater: Suggestions for disinfection strategy during coronavirus Disease 2019 (COVID-19) pandemic in China." *Environmental pollution* 262 (2020): 114665.
- [2] Rajmohan, Kunju Vaikarar Soundararajan, et al. "Plastic pollutants: effective waste management for pollution control and abatement." *Current Opinion in Environmental Science & Health* 12 (2019): 72-84.
- [3] Water Supply & Waste water Engineering, A.K.Upadhya, B-i/12.
- [4] Water supply and pollution control 8ed, Chadik, B-i/19.

39. Facilities required for teaching and learning

Lecture/Classroom

White board

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

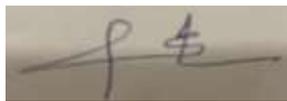
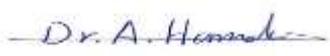
40. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Introduction.	AM2
2	The water used for industrial purposes.	AM2	CLO4,6
3	The engineering know - how to produce the required water quality for every industrial use.	AM2	CLO6,10
4	Introduction to the various types of industry, The corresponding water quality needs.	AM2
5	Water desalination.	AM2	CLO10
6	Iron and manganese removal.	AM2	CLO6,10
8	Water softening.	AM2	CLO6,10
9	Midterm exam.	AM2	CLO4,6
10	Sedimentation	AM2	CLO4,6
11	Chemical precipitation.	AM2	CLO6, 10
12	Water flotation, Water filtration and water aeration.	AM2	CLO10
13	Water recycling and reuse in industry.	AM2	CLO10
14	Water recycling and reuse in industry.	AM2	CLO10
15	Final exam.	AM2	CLO4,6,10

41. Matrix of Program LOs with Course Los

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Program Los		Course Los	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO4	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals, basic science, and mathematics.
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.	CLO6	Apply engineering design processes for highway design to produce cost-effective solutions.
		CLO10	Meet specified needs for highway design with consideration for social, economic, and environmental aspects.

Title	Name	Signature
Course coordinator	Dr. Mohamed Zakria	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif Khafaga	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4167	Course Title: Industrial water purification

42. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4167			
Year/level	Fourth year / Fifth level			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

43. Course Aims	
No.	Aim
AM1	Provide an engineer able to practice different methods of design the units of water supply system included in the course, the units of sewage treatment and sewerage system. (AM1).

44. Course Learning Outcomes (LOs)	
CLO6	Apply engineering design process in water sedimentation & filtration units, sewage treatment units and sewerage system.
CLO24	Achieve an optimum design of water sedimentation & filtration units, sewage treatment units and sewerage system.

45. Course Contents	
Topics	Week
Introduction to Industrial water purification	1
The water used for industrial purposes (part 1)	2

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	Civil Engineering Department	

The water used for industrial purposes (part 2)	3
The engineering know - how to produce the required water quality for every industrial use (part 1)	4
The engineering know - how to produce the required water quality for every industrial use (part)	5
Introduction to the various types of industry, The corresponding water quality needs (part 1)	6
Introduction to the various types of industry, The corresponding water quality needs (part 2)	7
Introduction to the various types of industry, The corresponding water quality needs (part 3)	8
Mid-term exam	9
The different technologies applied for industrial water treatment	10
Water desalination , Iron and manganese removal, Water softening,	11
Scaling and demineralization, Sedimentation ,Chemical precipitation	12
Water flotation, Water filtration and water aeration [1]	13
Water flotation, Water filtration and water aeration [2]	14
Final exam	15

46. Teaching and Learning methods											
Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning
CLO6	√		√	√		√					
CLO24	√		√	√		√					

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

47. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

48. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Sheets	CLO6, CLO24
3	Quizzes	CLO6, CLO24
4	Mid-term Exam	CLO6, CLO24
5	Oral/ Practical Exam	CLO6, CLO24
6	Final Exam	-----

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	-----
4	Mid-term Exam	9
5	Practical Exam	-----
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance				-

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	Civil Engineering Department	

	Quizzes			10%	10
	Mid-term exam			20%	20
Practical	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

49. List of References

- [1] Khidirov, Sanatjon, et al. "Exploration of the hydraulic structure of the water supply facilities operation mode and flow." E3S Web of Conferences. Vol. 264. EDP Sciences, 2021.
- [2] Wang, Jiao, et al. "Disinfection technology of hospital wastes and wastewater: Suggestions for disinfection strategy during coronavirus Disease 2019 (COVID-19) pandemic in China." Environmental pollution 262 (2020): 114665.
- [3] Rajmohan, Kunju Vaikarar Soundararajan, et al. "Plastic pollutants: effective waste management for pollution control and abatement." Current Opinion in Environmental Science & Health 12 (2019): 72-84.
- [4] Water Supply Engineering, Dr.B.C punmia, B-i/10.
- [5] Water Supply & Waste water Engineering, A.K.Upadhya, B-i/12.
- [6] Water supply and pollution control 8ed, Chadik, B-i/19.
- [7] Water supply Engineering, P.N.Modi, B-i/22.

50. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Moodle and Microsoft teams
Data show
Laboratory Usage

51. Matrix of Course Content with Course LO's			
No.	Topics	Aim	Los
1	Introduction to Industrial water purification	AM1	CLO6, CLO24
2	The water used for industrial purposes (part 1)	AM1	CLO6, CLO24
3	The water used for industrial purposes (part 2)	AM1	CLO6, CLO24
4	The engineering know - how to produce the required water quality for every industrial use (part 1)	AM1	CLO6, CLO24
5	The engineering know - how to produce the required water quality for every industrial use (part)	AM1	CLO6, CLO24
6	Introduction to the various types of industry, The corresponding water quality needs (part 1)	AM1	CLO6, CLO24
7	Introduction to the various types of industry, The corresponding water quality needs (part 2)	AM1	CLO6, CLO24
8	Introduction to the various types of industry, The corresponding water quality needs (part 3)	AM1	CLO6, CLO24
9	The different technologies applied for industrial water treatment	AM1	CLO6, CLO24
10	Water desalination , Iron and manganese removal, Water softening,	AM1	CLO6, CLO24
11	Scaling and demineralization, Sedimentation , Chemical precipitation	AM1	CLO6, CLO24
12	Water flotation, Water filtration and water aeration	AM1	CLO6, CLO24

52. Matrix of Program LOs with Course Los			
Program Los		Course Los	
PLO3	Apply engineering design processes that meets specified needs.	CLO6	Apply engineering design process in water sedimentation & filtration units, sewage treatment units and sewerage system.
PLO11	Achieve an optimum design in Sanitary works strategies.	CLO24	Achieve an optimum design of water sedimentation & filtration units, sewage treatment units and sewerage system.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Title	Name	Signature
Course coordinator	Dr. Salma Abdel Mageed.	
Program Coordinator:	Asso. Dr. Ahmed Hamdy.	
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4171	Course Title: Modern Construction Materials

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4171			
Year/level	fourth year / fifth level (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

2. Course Aims	
No.	Aim
AM1	Provide an engineer professional can select appropriate type of material for specific application.
AM2	Teach the students to practice the methodology of characterize the behavior of materials.

3. Learning Outcomes (LOs)	
CLO3	Develop and conduct appropriate experimentation and/or simulation to draw conclusions
CLO12	Practice research techniques and methods of investigation as an inherent part of learning.
CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams
CLO21	Select appropriate and sustainable technologies for construction of buildings. Infrastructures and water structures.

1. Course Contents

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Topics	Week
Introduction	1
Different types of new construction materials	2
Different types of new construction materials	3
Constituent materials of the new construction materials	4
Constituent materials of the new construction materials	5
Properties (physical)	6
Properties (chemical, mechanical)	7
Fabrication technology	8
Midterm exam	9
Comparison with conventional construction materials	10
Structural applications	11
Testing	12
Economical point of view	13
Economical point of view	14
Final Exam	15

2. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO3	√	√		√	√							
CLO12	√	√	√				√	√		√		
CLO15								√		√	√	
CLO21	√	√		√								

3. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

4. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-----
2	Reports	CLO3, CO12. CLO15, CLO21

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

3	Sheets	CLO3, CO12, CLO15, CLO21
4	Quizzes	CLO3, CLO21
5	Mid-term Exam	CLO3, CLO21
6	Final Exam	CLO3, CLO21

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Sheets	Bi-weekly
4	Quizzes	Bi-weekly
5	Mid-term Exam	9
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports	35%	35	5%	5
	sheets			10%	10
	Attendance			-	-
	Quizzes			5%	5
	Mid-term exam			20%	20
Final Exam		60%	60		
Total		100%	100		

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

8. List of References

- [1] Hall, M. R., Lindsay, R., & Krayenhoff, M. (Eds.). (2012). Modern earth buildings: Materials, engineering, constructions and applications. Elsevier.
- [2] Watts, A. (2014). Modern construction envelopes. Ambra Verlag.
- [3] Peck, M. (Ed.). (2014). Modern concrete construction manual: structural design, material properties, sustainability. DE GRUYTER.
- [4] Forbes, L. H., & Ahmed, S. M. (2010). Modern construction: lean project delivery and integrated practices. CRC press.

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

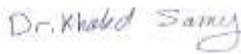
	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

10. Matrix of Course Content with Course LO's			
Week	Topics	Aim	LOs
1	Introduction	AM1,AM3	CLO3, CLO21
2	Different types of new construction materials	AM1,AM3	CLO3, CLO21
3	Different types of new construction materials	AM1,AM3	CLO3, CLO21
4	Constituent materials of the new construction materials	AM1,AM3	CLO3, CLO21
5	Constituent materials of the new construction materials	AM1,AM3	CLO3, CLO21
6	Properties (physical)	AM1,AM3	CLO3, CLO21
7	Properties (chemical, mechanical)	AM1,AM3	CLO3, CLO21
8	Fabrication technology	AM1,AM3	CLO3, CLO21
9	Midterm exam	AM1,AM3	CLO3, CLO21
10	Comparison with conventional construction materials	AM1,AM3	CLO3, CLO21
11	Structural applications	AM1,AM3	CLO12, CLO15, CLO21
12	Testing	AM1,AM3	CLO12, CLO15, CLO21
13	Economical point of view	AM1,AM3	CLO12, CLO15, CLO21
14	Economical point of view	AM1,AM3	CLO3,CLO12, CLO15, CLO21

11. Matrix of Program LOs with Course Los			
Program LOs		Course LOs	
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	Develop and conduct appropriate experimentation and/or simulation to draw conclusions.
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO12	Practice research techniques and methods of investigation as an inherent part of learning.

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PLO7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams
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.	CLO21	Select appropriate and sustainable technologies for construction of buildings. Infrastructures and water structures.

Title	Name	Signature
Course coordinator	Dr. Khaled samy	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Sherif Khafaga	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5 th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4172	Course Title: Using Models and Structural Analysis Methodology

5. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4172			
Year/level	fourth year / fifth level (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

6. Course Aims	
No.	Aim
AM1	Teach the students how to analysis of structure.
AM3	Give the students the knowledge and expertise to analysis of structure using several techniques.

7. Learning Outcomes (LOs)	
CLO1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics,

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

8. Course Contents	
Topics	Week
Direct and indirect aspects	1
Indirect models	2
displacement models	3
Influence line diagrams for deflection	4
Influence line diagrams for stress resultant	5
Scale factors	6
Practical applications of the indirect method	7
Practical applications of the indirect method	8
Midterm exam	9
Experimental procedure in the indirect method	10
Direct method of model analysis	11
Applications	12
Influence surfaces for deformations and internal forces	13
Influence surfaces for deformations and internal forces	14
Final Exam	15

9. Teaching and Learning methods	
Course learning Outcomes (LOs)	Teaching and Learning Methods

	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO1	√	√		√								
CLO2	√	√		√								
CLO22							√			√	√	

10. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

11. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Sheets	CLO1,CLO2,CLO22
3	Quizzes	CLO1,CLO2,CLO22
4	Mid-term Exam	CLO1,CLO2,CLO22
6	Final Exam	CLO1,CLO2,CLO22

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	Bi-weekly

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	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

4	Mid-term Exam	9
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			-	
	Quizzes			10%	10
	Mid-term exam			20%	20
Final Exam		60%	60		
Total		100%	100		

12. List of References

- [1] Duff, I. S., Erisman, A. M., & Reid, J. K. (2017). *Direct methods for sparse matrices*. Oxford University Press.
- [2] Dacorogna, B. (2007). *Direct methods in the calculus of variations* (Vol. 78). Springer Science & Business Media.
- [3] O'Connor, C., & Shaw, P. (2000). *Bridge loads: An international perspective*. CRC Press.
- [4] Hambly, E. C. (1991). *Bridge deck behaviour*. CRC Press.

13. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

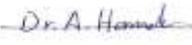
14. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Direct and indirect aspects	AM2, AM3	CLO1,CLO2,CLO22
2	Indirect models	AM2, AM3	CLO1,CLO2,CLO22
3	displacement models	AM2, AM3	CLO1,CLO2,CLO22
4	Influence line diagrams for deflection	AM2, AM3	CLO1,CLO2,CLO22
5	Influence line diagrams for stress resultant	AM2, AM3	CLO1,CLO2,CLO22
6	Scale factors	AM2, AM3	CLO1,CLO2,CLO22
7	Practical applications of the indirect method	AM2, AM3	CLO1,CLO2,CLO22
8	Practical applications of the indirect method	AM2, AM3	CLO1,CLO2,CLO22
9	Midterm exam	AM2, AM3	CLO1,CLO2,CLO22
10	Experimental procedure in the indirect method	AM2, AM3	CLO1,CLO2,CLO22
11	Direct method of model analysis	AM2, AM3	CLO1,CLO2,CLO22
12	Applications	AM2, AM3	CLO1,CLO2,CLO22
13	Influence surfaces for deformations and internal forces	AM2, AM3	CLO1,CLO2,CLO22
14	Influence surfaces for deformations and internal forces	AM2, AM3	CLO1,CLO2,CLO22

15. Matrix of Program LOs with Course Los			
Program LOs		Course Los	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
		CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
PLO11	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics,	CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics,

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Hydrology Mechanics.	and	Fluid	
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Title	Name	Signature
Course coordinator	Dr. Mamdouh Tawakol	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification

Course Code: CVE4173 Course Title: advanced analysis of reinforced concrete bridges

16. Basic information

Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4173			
Year/level	Fourth year / Fifth level			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	4

17. Course Aims

No.	Aim
1	Provide a professional engineer capable of working efficiently and effectively in concrete bridges area design (AM1).
2	Teach the students to practice the methodology in thinking and describing concrete bridges design problems (AM2).
3	Make it possible for graduates to pursue continuing education in concrete bridges design specialty. (AM5)

18. Learning Outcomes (LOs)

CLO6	Apply engineering design processes to produce cost-effective solutions.
CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
CLO24	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures.
CLO32	Deal with project insurance and guarantees.

19. Course Contents

Topics	Week
Introduction	1
The conceptual design of concrete bridges	2
conceptual design of hybrid material bridges	3
Girder type bridges, Analysis and design of different structural elements, Decks, Bearings, Piers and footing are involved.	4
Girder type bridges (part 2)	5
Box girder bridges (part1)	6
. Box girder bridges (part2)	7
Arch bridges (part1)	8
Arch bridges(part2)	10
Advanced life -cycle analysis of existing concrete bridges (1)	11
Advanced life -cycle analysis of existing concrete bridges (2)	12
Hybird FRP concrete for brige structure (1)	13
Hybird FRP concrete for brige structure (2)	14
Final exam	15

20. Teaching and Learning methods												
Course learning Outcomes (LOs)	Teaching and Learning Methods											
	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>Lectures (face to face / online)</td> <td>Presentation / Movies</td> <td>Discussions</td> <td>Tutorials</td> <td>Practical and lab. experiments</td> <td>Problem Solving</td> <td>Brain Storming</td> <td>Projects and Team Working</td> <td>Site Visits</td> <td>Research / Reports</td> <td>Self-learning</td> <td>Modeling and Simulation</td> </tr> </table>	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning
Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation	

CLO6	√	√		√		√	√					√	
CLO17			√		√	√	√					√	√
CLO24	√	√	√	√	√	√	√						√
CLO32	√	√	√	√			√	√				√	√

21. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

22. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO6, CLO17, CLO24,CLO31
3	Quizzes	-
4	Mid-term Exam	CLO6,CLO17,CLO24, CLO31
5	Practical Exam	
6	Final Exam	CLO6,CLO17,CLO24, CLO31

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	weekly

3	Quiz 1 / Quiz 2	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-----
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	10%	10
	Attendance			10%	10
	Quiz 1 / Quiz 2			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

23. List of References

- [1] Strauss, A., Bergmeister, K., Hoffmann, S., Pukl, R., & Novák, D. (2008). Advanced life-cycle analysis of existing concrete bridges. *Journal of Materials in Civil Engineering*, 20(1), 9-19.
- [2] Plos, M., Shu, J., Zandi, K., & Lundgren, K. (2017). A multi-level structural assessment strategy for reinforced concrete bridge deck slabs. *Structure and Infrastructure Engineering*, 13(2), 223-241.

24. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

	Ministry of Higher Education Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Moodle and Microsoft teams
Data show
Laboratory Usage

25. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction	AM1,	CLO6, CLO17
2	The conceptual design of concrete bridges	AM1	CLO6,CLO24
3	conceptual design of hybrid material bridges	AM1, AM5	CLO6,CLO24,CLO17
4	Girder type bridges, Analysis and design of different structural elements, Decks, Bearings, Piers and footing are involved.	AM1,AM2,AM5	CLO6,CLO24,CLO17, CLO31
5	Girder type bridges (part 2)	AM1, AM5	CLO6,CLO24,CLO17
6	Box girder bridges (part1)	AM1	CLO6,CLO24
8	. Box girder bridges (part2)	AM1, AM2, AM5	CLO6,CLO24,CLO17,B5.2
9	Arch bridges (part1)	AM1	CLO6,CLO24
10	Arch bridges(part2)	AM1,AM5	CLO6,CLO17
11	Advanced life -cycle analysis of existing concrete bridges (1)	AM1	CLO6, CLO24
12	Advanced life -cycle analysis of existing concrete bridges (2)	AM1,AM2, AM5	CLO6,CLO24,CLO17, CLO31
13	Hybird FRP concrete for brige structure (1)	AM1	CLO6,CLO24
14	Hybird FRP concrete for brige structure (2)	AM1,AM2,AM5	CLO6,CLO24,CLO17,CLO31

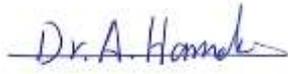
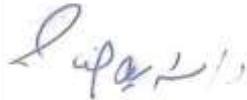
26. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO3	Application of engineering design processes for the production of cost-effective solutions meet needs Specific taking into account cultural, social, economic, environmental and professional ethics In accordance with	CLO6	Apply engineering design processes to produce cost-effective solutions.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

	specialization and in accordance with the principles of design and sustainable development. In accordance with specialization and in accordance with the principles of design and sustainable development.		
PLO9	use of innovative and innovative thinking and gain entrepreneurship and leadership skills to engage and respond to new positions.	CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
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.	CLO24	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures.
PLO15	Deal with bidding, contract and financial issues including project insurance and guarantees.	CLO31	Deal with project insurance and guarantees.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Title	Name	Signature
Course coordinator	Dr. Khaled samy	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4174	Course Title: Soil & Rocks in Dry Regions

27. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4174			
Year/level	Fourth year / 5 th level			(1 st Semester)
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	-	4

28. Course Aims	
No.	Aim
AM2	Teach the students to practice the methodology in thinking and describing soil problems.
AM3	Give students with technical skills to evaluate properties of swelling and collapsing soil.

29. Course Learning Outcomes (CLOs)	
CLO3	Conduct appropriate soil experimentation to draw conclusions.
CLO9	Utilize codes of practice and standards for soil mechanics and construction of foundations.
CLO22	Use physical measurements by applying a full range of civil engineering concepts and techniques of Soil Mechanics.

30. Course Contents	
Week No.	Topics
1	Introduction into problematic soil.

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	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

2	Swelling soil: Origin and occurrence, mineralogy, identification and classification.
3	Swelling soil: Laboratory testing: simple tests, free swell tests, swelling pressure, swelling potential, swelling pressure tests.
4	Foundation on swelling soil: conditions & precautions of design shallow foundation on swelling soil. Horizontal and vertical barriers, surface drains.
5	Foundation on swelling: soil replacement, chemical treatment of swelling soil, deep foundation.
6	Collapsing soil: Origin and occurrence, mineralogy, identification and classification.
7	Collapsing soil: Laboratory testing: simple tests, collapsibility potential
8	Foundation on Collapsing soil: conditions & precautions of design shallow foundation on collapsing soil.
9	MidTerm Exam
10	Foundation on Collapsing: soil replacement, chemical treatment of Collapsing soil, soil compaction.
11	Rock mechanics: classification of rocks, intact rock, geological structures, rock mass.
12	Rock mechanics: Laboratory testing to determine physical and mechanical properties, Engineering classification of rocks.
13	Foundation on rocks: conditions & precautions of design shallow foundation on rock.
14	Bearing capacity of rocks under shallow foundation, Engineering application on rock mechanics.
15	Final Exam.

31. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods
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	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO3	√	-	-	√	√	-	-	-	-	-	-	-
CLO9	√	√	√	√	√	√	√	-	-	√	-	-
CLO22	√	√	-	√	√	-	-	-	-	-	-	-

32. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

33. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Reports	CLO3, CLO9, CLO22
3	Sheets	CLO3, CLO9, CLO22
4	Quiz 1 / Quiz 2	-----
5	Mid-term Exam	CLO9, CLO22
6	Oral Exam	CLO3, CLO22
7	Practical Exam	CLO3, CLO22
8	Final Exam	CLO9, CLO22

7.2 Assessment Schedule

No.	Assessment Method	Weeks
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	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Sheets	40%	40	20%	20
	Reports / Activities			-	-
	Attendance			-	-
	Quiz 1 / Quiz 2			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance			-	-
	Lab. Reports			-	-
	Lab. Activities			-	-
	Final oral exam			-	-
Final Exam	Written exam	60%	60	60%	60
Total		100%	100	100%	100

34. List of References

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

[1] Permanent Committee for preparation of Egyptian Code, Egyptian Code of Practice for Soil Mechanics and Design and Construction of foundations, parts 5,10, Housing and Building Research Center, Cairo,2020.

[2] Nelson,J.D.and Chao K.C, "Foundation Engineering for Expansive Soils", 2015.

[3] Liu C and Evett J.B, "Soils and Foundations" 7th Edition, Prentice Hall, ISBN: 0132221381 (2007).

[4] Nelson, J.D. and Miller,D.J., "Expansive soils: problem and practice in foundation and pavement Engineering", John Wiley and Sons, 1997.

[5] Goodman ,R.E., "Introduction to Rock Mechanics", John Wiley and Sons, 2nd Edition, 1989.

35. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

36. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LOs
1	Introduction into problematic soil.	2	CLO9, CLO22
2	Swelling soil: Origin and occurrence, mineralogy, identification and classification.	2	CLO9, CLO22
3	Swelling soil: Laboratory testing: simple tests, free swell tests, swelling pressure, swelling potential, swelling pressure tests.	2,3	CLO3, CLO9, CLO22
4	Foundation on swelling soil: conditions & precautions of design shallow foundation on swelling soil. Horizontal and vertical barriers, surface drains.	2	CLO9, CLO22
5	Foundation on swelling: soil replacement, chemical treatment of swelling soil, deep foundation.	2	CLO9, CLO22
6	Collapsing soil: Origin and occurrence, mineralogy, identification and classification.	2	CLO9, CLO22
7	Collapsing soil: Laboratory testing: simple tests,	2,3	CLO3, CLO9, CLO22

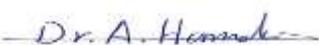
	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

	collapsibility potential		
8	Foundation on Collapsing soil: conditions & precautions of design shallow foundation on collapsing soil.	2	CLO9, CLO22
10	Foundation on Collapsing: soil replacement, chemical treatment of Collapsing soil, soil compaction.	2	CLO9, CLO22
11	Rock mechanics: classification of rocks, intact rock, geological structures, rock mass.	2	CLO9, CLO22
12	Rock mechanics: Laboratory testing to determine physical and mechanical properties, Engineering classification of rocks.	2,3	CLO3, CLO9, CLO22
13	Foundation on rocks: conditions & precautions of design shallow foundation on rock.	2,3	CLO9, CLO22
14	Bearing capacity of rocks under shallow foundation, Engineering application on rock mechanics.	2,3	CLO9, CLO22

37. Matrix of Program LOs with Course Los			
Program LOs		Course LOs	
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	Conduct appropriate soil experimentation to draw conclusions.
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	CLO9	Utilize codes of practice and standards for soil mechanics and construction of foundations.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

PLO11	<p>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.</p>	CLO22	<p>Use physical measurements by applying a full range of civil engineering concepts and techniques of Soil Mechanics.</p>
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Title	Name	Signature
Course coordinator	Dr. Mounir Kamel	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif Khafaga	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4175	Course Title: Restoration and consolidation of facilities

38. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4175			
Year/level	Fourth year / Fifth level			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

39. Course Aims	
No.	Aim
AM1	Provide an engineering professional that is good in numerous facets of design and implementation in the practice of civil engineering structures (AM1)
AM2	Teach the students how to think about and design problems and requirements using scientific methods (AM2)
AM4	Strengthening the links between the sectors participating in the process of establishing national civil projects and the graduates of the program in the field of practical training and entrepreneurship and qualifying the graduates to compete for leadership positions in their profession. (AM4)

40. Course Learning Outcomes (LOs)	
CLO6	Apply engineering design processes to produce cost-effective solutions.
CLO8	Achieve the principles of design within the principles and contexts of sustainable design and development.
CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
CLO24	Achieve an optimum design of Reinforced Concrete elements

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	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

41. Course Contents	
Topics	Week
Introduction to Repair & Strengthening of Structures (Part 1)	1
Introduction to Repair & Strengthening of Structures (Part 2)	2
Causes of deterioration of concrete structures	3
Evaluation of concrete structures	4
Repair and strengthening materials (types, selection, handling)	5
Bond between repair and strengthening materials and substrate concrete	6
Different repair and strengthening techniques (Part 1)	7
Different repair and strengthening techniques. (Part 2)	8
Mid-term exam	9
Protection and maintenance of concrete structures (Part 1)	10
Protection and maintenance of concrete structures (Part 2)	11
techniques. Protection and maintenance of concrete structures. Repair and strengthening of some concrete elements (footing, column, beam, slab... etc). (Part 1)	12
techniques. Protection and maintenance of concrete structures. Repair and strengthening of some concrete elements (footing, column, beam, slab... etc). (Part 2)	13
techniques. Protection and maintenance of concrete structures. Repair and strengthening of some concrete elements (footing, column, beam, slab... etc). (Part 3)	14
Final exam	15

42. Teaching and Learning methods	
Course learning Outcomes (LOs)	Teaching and Learning Methods

	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO6	√			√			√					
CLO8	√			√			√					
CLO16	√			√						√	√	
CLO24	√			√			√					

43. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

44. Students' Assessment

7.1 Students' Assessment Method		
No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO6, CLO8, CLO16, CLO24
3	Quizzes	CLO6, CLO8, CLO16, CLO24
4	Mid-term Exam	CLO6, CLO8, CLO16, CLO24
5	Practical Exam	---
6	Final Exam	CLO6, CLO8, CLO16, CLO24

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	weekly
2	Sheets	weekly
3	Quizzes	-
4	Mid-term Exam	9
5	Practical Exam	-----
6	Final Exam	16

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			10%	10
	Quizzes			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

45. List of References

- [1] Reynolds, C. E., Steedman, J. C., & Threlfall, A. J. (2007). Reinforced concrete designer's handbook. CRC Press.
- [2] Darwin, D., Dolan, C. W., & Nilson, A. H. (2016). Design of concrete structures (Vol. 2). New York, NY, USA:: McGraw-Hill Education.
- [3] Wang, C. K., & Salmon, C. G. (1979). Reinforced concrete design
- [4] Shetty, M. S., & Jain, A. K. (2019). Concrete Technology (Theory and Practice), 8e. S. Chand Publishing.
- [5] Raju, N. K. (2005). Structural Design and Drawing: Reinforced Concrete and Steel. Universities Press.

46. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

47. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction to Repair & Strengthening of Structures (Part 1)	AM1, AM2	CLO6, CLO8, CLO16, CLO24
2	Introduction to Repair & Strengthening of Structures (Part 2)	AM1, AM2	CLO6, CLO8, CLO16, CLO24
3	Causes of deterioration of concrete structures	AM1, AM2, AM4	CLO6, CLO8, CLO16, CLO24
4	Evaluation of concrete structures	AM1, AM2	CLO6, CLO8, CLO16, CLO24
5	Repair and strengthening materials (types, selection, handling)	AM1, AM2	CLO6, CLO8, CLO16, CLO24
6	Bond between repair and strengthening materials and substrate concrete	AM1, AM2	CLO6, CLO8, CLO16, CLO24
7	Different repair and strengthening techniques	AM1,	CLO6, CLO8, CLO16,

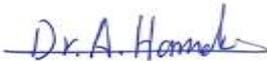
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	Civil Engineering Department	

	(Part 1)	AM2	CLO24
8	Different repair and strengthening techniques. (Part 2)	AM1, AM2	CLO6, CLO8, CLO16, CLO24
9	Protection and maintenance of concrete structures (Part 1)	AM1, AM2	CLO6, CLO8, CLO16, CLO24
10	Protection and maintenance of concrete structures (Part 2)	AM1, AM2	CLO6, CLO8, CLO16, CLO24
11	techniques. Protection and maintenance of concrete structures. Repair and strengthening of some concrete elements (footing, column, beam, slab... etc). (Part 1)	AM1, AM2,AM4	CLO6, CLO8, CLO16, CLO24
12	techniques. Protection and maintenance of concrete structures. Repair and strengthening of some concrete elements (footing, column, beam, slab... etc). (Part 2)	AM1, AM2	CLO6, CLO8, CLO16, CLO24

48. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO3	1 Apply engineering design processes to produce cost-effective solutions., Meet specified needs with consideration for global, cultural, social, economic, environmental, and ethical aspects and achieve the principles of design within the principles and contexts of sustainable design and development.	CLO6, CLO8	Apply design engineering processes to .produce cost-effective solutions Achieve the principles of design within the principles and contexts of .sustainable design and development
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures..	CLO24	Achieve an optimum design of Reinforced Concrete elements

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Title	Name	Signature
Course coordinator	DR. mamdouh tawakol	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4177	Course Title: Geodetic survey

49. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4177			
Year/level	Forth year / fifth level (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	-	4

50. Course Aims	
No.	Aim
AM4	Strengthen the links between the sectors participating in the process of establishing national civil projects.
AM7	Work with contemporary field instrumentation, design and perform experiments, and analyze and interpret the results.

51. Course Learning Outcomes (CLOs)	
CLO6	Apply transportation planning processes to produce cost-effective solutions.
CLO7	Meet specified needs for transportation planning with consideration for social, economic, and environmental aspects.
CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of transportation planning.
CLO24	Achieve an optimum planning of transportation networks.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

52. Course Contents	
Topics	Week
Introduction for Astronomical coordinate system	1
The spherical triangle	2
The theory of least square errors and its applications in surveying problem	3
Different datum surfaces and Properties of ellipse	4
Projecting observations onto a datum and calculating coordinates on them	5
Transformation between different coordinate systems	6
Methods of calculating coordinates in the GPS system	7
Introduction to GNSS	8
Medterm	9
GPS operations planning	10
GPS applications in civil projects	11
Introduction to GIS	12
research assessment	13
Practical exam	14
Final exam	15

53. Teaching and Learning methods	
Course learning Outcomes (CLOs)	Teaching and Learning Methods

	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO6	√	√		√								
CLO7	√	√		√	√							
CLO22					√					√	√	
CLO24	√	√	√	√	√		√	√				

54. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

55. Students' Assessment

7.1 Students' Assessment Method		
No.	Assessment Method	CLOs
1	Attendance	-----
2	Reports / Sheets	CLO6, CLO7, CLO22, CLO24
3	Quiz 1 / Quiz 2	CLO6, CLO7, CLO22, CLO24
4	Mid-term Exam	CLO6, CLO7, CLO22, CLO24
5	Practical Exam	-----
6	Final Exam	CLO6, CLO7, CLO22, CLO24

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	Civil Engineering Department	

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	10%	10
	Attendance			-	-
	Quiz 1 / Quiz 2			10%	10
	Mid-term exam			20%	20
Practical	Practical Attendance	-	-		
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam			-	-
Final Exam		60%	60		
Total		100%	100		

56. List of References

- [1] Schofield, Wilfred, and Mark Breach. *Engineering surveying*. CRC Press, 2007.
- [2] Breach, Mark, and W. Schofield. *Engineering surveying*. Elsevier Ltd. All rights reserved, 2007.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

57. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

58. Matrix of Course Content with Course LO's

No.	Topics	Aim	CLOs
1	Introduction for Astronomical coordinate system	AM4	CLO6, CLO24
2	The spherical triangle	AM4	CLO6, CLO7, CLO22, CLO24
3	The theory of least square errors and its applications in surveying problem	AM4,AM7	CLO6, CLO7, CLO22, CLO24
4	Different datum surfaces and Properties of ellipse	AM4,AM7	CLO6, CLO7, CLO22, CLO24
5	Projecting observations onto a datum and calculating coordinates on them	AM4,AM7	CLO22, CLO24
6	Transformation between different coordinate systems	AM4,AM7	CLO22, CLO24
7	Methods of calculating coordinates in the GPS system	AM4,AM7	CLO22, CLO24
8	Introduction to GNSS	AM4,AM7	CLO22, CLO24
9	GPS operations planning	AM7	CLO7, CLO22, CLO24
10	GPS applications in civil projects	AM7	CLO7, CLO22, CLO24
11	Introduction to GIS	AM7	CLO7, CLO22, CLO24
12	research assessment	AM7	CLO22, CLO24

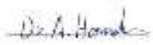
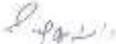
	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

59. Matrix of Program LOs with Course LOs

Program LOs		Course LOs	
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.	CLO6	Apply transportation planning processes to produce cost-effective solutions.
PLO 7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO7	Meet specified needs for transportation planning with consideration for social, economic, and environmental aspects.
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	CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of transportation planning.

	Ministry of Higher Education	
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	Civil Engineering Department	

	engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.		
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.	CLO24	Achieve an optimum planning of transportation networks.

Title	Name	Signature
Course coordinator	Asso. Prof. Dr. Ahmad Hamdy Ibrahim	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy Ibrahim	
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4176	Course Title: remote sensing

60. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4176			
Year/level	Fourth year / 5 th level (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	-	4

61. Course Aims	
No.	Aim
AM4	Strength the links between the sectors participating in the process of establishing national civil projects.
AM7	Work with contemporary field instrumentation, design and perform experiments, and analyze and interpret the results.

62. Course Learning Outcomes (CLOs)	
CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals.
CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi- cultural teams.
CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Surveying.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

63. Course Contents	
Topics	Week
Introduction to remote sensing	1
Basic Principles of Remote Sensing	2
Digital Image Analysis	3
Earth Observation Sensors and Platforms	4
Spectral Signature of different land cover features	5
Types of Satellite image	6
Thermal & Microwave Remote Sensing,	7
Digital Image Processing: Basic Concepts of Rectification and Registration, Enhancement,	8
midterm	9
Classification and accuracy assessment techniques.	10
RS Applications: Agriculture and Soil, Forestry and Ecology, Geoscience and Geo-hazards, Marine and Atmospheric Sciences, Urban and Regional Studies and Water Resources.P (1)	11
RS Applications: Agriculture and Soil, Forestry and Ecology, Geoscience and Geo-hazards, Marine and Atmospheric Sciences, Urban and Regional Studies and Water Resources. P (2)	12
research assessment	13
Practical exam	14
Final exam	15

64. Teaching and Learning methods	
Course learning Outcomes (CLOs)	Teaching and Learning Methods

	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO2	√	√		√								
CLO15	√	√		√	√							
CLO16					√					√	√	
CLO22	√	√	√	√	√		√	√				

65. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

66. Students' Assessment

7.1 Students' Assessment Method		
No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO2, CLO15, CLO16, CLO22
3	Quiz 1 / Quiz 2	CLO2, CLO15, CLO22
4	Mid-term Exam	CLO2, CLO22
5	Practical Exam	CLO2
6	Final Exam	CLO2, CLO15, CLO16

	Ministry of Higher Education Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	10%	10
	Attendance				-
	Quiz 1 / Quiz 2			10%	10
	Mid-term exam			20%	20
Practical	Practical Attendance	-	-		
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam			-	-
Final Exam		60%	60		
Total		100%	100		

67. List of References

- [1] Schofield, Wilfred, and Mark Breach. *Engineering surveying*. CRC Press, 2007.
- [2] Breach, Mark, and W. Schofield. *Engineering surveying*. Elsevier Ltd. All rights reserved, 2007.

68. Facilities required for teaching and learning

Lecture/Classroom

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

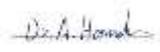
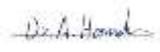
69. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction to remote sensing	AM4,AM7	CLO2, CLO15
2	Basic Principles of Remote Sensing	AM4	CLO2, CLO22
3	Digital Image Analysis	AM4,AM7	CLO2, CLO15, CLO16, CLO22
4	Earth Observation Sensors and Platforms	AM7	CLO15, CLO22
5	Spectral Signature of different land cover features	AM7	CLO2, CLO15, CLO16, CLO22
6	Types of Satellite image	AM4,AM7	CLO2, CLO15, CLO16, CLO22
7	Thermal & Microwave Remote Sensing,	AM4,AM7	CLO16
8	Digital Image Processing: Basic Concepts of Rectification and Registration, Enhancement,	AM4,AM7	CLO16
9	Classification and accuracy assessment techniques.	AM4	CLO2, CLO16, CLO22
10	RS Applications: Agriculture and Soil, Forestry and Ecology, Geoscience and Geo-hazards, Marine and Atmospheric Sciences, Urban and Regional Studies and Water Resources.P (1)	AM4	CLO2, CLO15
11	RS Applications: Agriculture and Soil, Forestry and Ecology, Geoscience and Geo-hazards, Marine and Atmospheric Sciences, Urban and Regional Studies and Water Resources. P (2)	AM4	CLO16, CLO22
12	research assessment	AM4	CLO16, CLO22

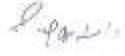
	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

70. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals, basic science, and mathematics.
PLO 7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
PLO 8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
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: Surveying.	CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Surveying.

Title	Name	Signature
Course coordinator	Asso. Prof. Dr. Ahmad Hamdy Ibrahim	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy Ibrahim	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4178	Course Title: geographic information system

71. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4178			
Year/level	Fourth year / 5 th level (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	-	4

72. Course Aims	
No.	Aim
AM4	Strength the links between the sectors participating in the process of establishing national civil projects.
AM7	Work with contemporary field instrumentation, design and perform experiments, and analyze and interpret the results.

73. Course Learning Outcomes (CLOs)	
CLO6	Apply transportation planning processes to produce cost-effective solutions.
CLO7	Meet specified needs for transportation planning with consideration for social, economic, and environmental aspects.
CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Surveying.
CLO24	Achieve an optimum planning of transportation networks.

74. Course Contents	
Topics	Week
Introduction to GIS	1
Different types of gis data	2
GIS data capture technique	3
Convert from vector to raster data	4
Components of geographic data	5
Spatial relationships with shared geometry	6
Database design	7
GIS data analysis	8
midterm	9
GIS application	10
Efficient GIS system	11
Network data analysis	12
research assessment	13
Practical exam	14
Final exam	15

75. Teaching and Learning methods												
Course learning Outcomes (LOs)	Teaching and Learning Methods											
		Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

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	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

CLO2	√	√		√								
CLO15	√	√		√	√							
CLO16					√					√	√	
CLO22	√	√	√	√	√		√	√				

76. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

77. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Reports / Sheets	CLO2, CLO15, CLO16, CLO22
3	Quiz 1 / Quiz 2	CLO2, CLO15, CLO22
4	Mid-term Exam	CLO2, CLO22
5	Practical Exam	CLO2
6	Final Exam	CLO2, CLO15, CLO16

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	9
5	Practical Exam	-
6	Final Exam	16

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	10%	10
	Attendance			-	
	Quiz 1 / Quiz 2			10%	10
	Mid-term exam			20%	20
Practical	Practical Attendance	-	-		
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam			-	-
Final Exam		60%	60		
Total		100%	100		

78. List of References

- [1] Schofield, Wilfred, and Mark Breach. *Engineering surveying*. CRC Press, 2007.
- [2] Breach, Mark, and W. Schofield. *Engineering surveying*. Elsevier Ltd. All rights reserved, 2007.

79. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

80. Matrix of Course Content with Course LO's

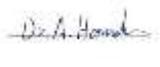
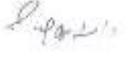
No.	Topics	Aim	CLOs
1	Introduction to GIS	AM4,AM7	CLO2, CLO15
2	Different types of gis data	AM4	CLO2, CLO22
3	GIS data capture technique	AM4,AM7	CLO2, CLO15, CLO16, CLO22
4	Convert from vector to raster data	AM7	CLO15, CLO22
5	Components of geographic data	AM7	CLO2, CLO15, CLO16, CLO22
6	Spatial relationships with shared geometry	AM4,AM7	CLO2, CLO15, CLO16, CLO22
7	Database design	AM4,AM7	CLO16
8	GIS data analysis	AM4,AM7	CLO16
9	GIS application	AM4	CLO2, CLO16, CLO22
10	Efficient GIS system	AM4	CLO2, CLO15
11	Network data analysis	AM4	CLO16, CLO22
12	research assessment	AM4	CLO16, CLO22

81. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. by applying engineering fundamentals, basic science, and mathematics.
PLO 7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO15	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
PLO 8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
PLO 11	Select appropriate and sustainable technologies for	CLO22	Use either numerical techniques or physical measurements by applying a full

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<p>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: Surveying.</p>		<p>range of civil engineering concepts and techniques of: Surveying.</p>
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Title	Name	Signature
Course coordinator	Asso. Prof. Dr. Ahmad Hamdy Ibrahim	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy Ibrahim	
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

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	Civil Engineering Department	

Course Specification	
Course Code: CVE 4179	Course Title: Railway Engineering (1)

82. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4179			
Year/level	Fourth year / 5 th level			(1 st Semester)
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	-	4

83. Course Aims	
No.	Aim
AM1	Provide an engineer professional that is proficient in railway engineering.
AM3	Give the students the knowledge about the fundamentals of the railway engineering to plan railway engineering projects using contemporary techniques.

84. Course Learning Outcomes (CLOs)	
CLO6	Apply engineering design processes for railway design to produce cost-effective solutions.
CLO7	Meet specified needs for railway design with consideration for social, economic, and environmental aspects.
CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of railway engineering.
CLO24	Achieve an optimum design of railway engineering.

85. Course Contents

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Week No.	Topics
1	Introduction about railway engineering
2	Railway dynamics: Tractive effort and resistance, Acceleration and braking, Line capacity.
3	Railway alignment: Longitudinal and cross sections, Railway path.
4	Railway alignment: Vertical and horizontal curve design.
5	Railway alignment: Gaparite, Cumulative curve.
6	Structural design of rail: Wheel - rail interaction, Forces acting on the rail.
7	Structural design of rail: Joined and welded rail design.
8	Structural design of rail: Sleeper and ballast design.
9	MidTerm Exam
10	Unballasted rail technology and magnetic train.
11	Turnouts, Stations and signals.
12	Maintenance and Renewals (P1)
13	Maintenance and Renewals (P2)
14	Revision.
15	Final Exam.

86. Teaching and Learning methods												
Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO6	√	√	√	√	-	√	-	-	-	√	√	-

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CLO7	√	√	-	√	-	-	-	-	-	√	√	-
CLO22	√	-	√	√	-	√	√	-	-	√	√	-
CLO24	-	-	-	√	-	√	√	√	-	√	√	-

87. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

88. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-----
2	Reports	CLO6, CLO7, CLO22, CLO24
3	Sheets	CLO6, CLO7, CLO22, CLO24
4	Quiz 1 / Quiz 2	-----
5	Mid-term Exam	CLO6, CLO7, CLO22, CLO24
6	Oral/ Practical Exam	-----
7	Final Exam	CLO6, CLO7, CLO22, CLO24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-
6	Final Exam	15

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7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports	40%	40	5%	5
	Sheets			15%	15
	Attendance			-	-
	Quiz 1 / Quiz 2			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance			-	-
	Lab. Reports			-	-
	Lab. Activities / Projects			-	-
	Final oral / practical exam			-	-
Final Exam	Written exam	60%	60	60%	60
Total		100%	100	100	100

89. List of References

- [1] Egyptian code of practice for airport and highway construction and Bridges, Cairo, 2020.
- [2] Mannering, F.L. and Kilareski, W.P., "Principles of Highway Engineering and Traffic Analysis", John Wiley & Sons, 7th edition, New York, 2020.
- [3] S.C.Saxena, S.P. Arora, "A Textbook of Railway Engineering", Dhanpat Rai Publications, (2005).
- [4] K. Bindra and S. P. Bindra, "Elements of Bridges, Tunnel and Railway Engineering", Dhaupat Rai & Sons, (1989).

90. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

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Moodle and Microsoft teams
Data show
Laboratory Usage

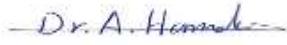
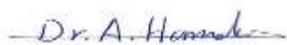
91. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LOs
1	Introduction about railway engineering	1	CLO7, CLO24
2	Railway dynamics: Tractive effort and resistance, Acceleration and braking, Line capacity.	1	CLO7, CLO22, CLO24
3	Railway alignment: Longitudinal and cross sections, Railway path.	1,3	CLO6, CLO7, CLO24
4	Railway alignment: Vertical and horizontal curve design.	1,3	CLO6, CLO7, CLO24
5	Railway alignment: Gaparite, Cumulative curve.	1,3	CLO6, CLO7, CLO22, CLO24
6	Structural design of rail: Wheel - rail interaction, Forces acting on the rail.	1,3	CLO6, CLO7, CLO22, CLO24
7	Structural design of rail: Joined and welded rail design.	1,3	CLO6, CLO7, CLO22, CLO24
8	Structural design of rail: Sleeper and ballast design.	1,3	CLO6, CLO7, CLO24
10	Unballasted rail technology and magnetic train.	1,3	CLO6, CLO24
11	Turnouts, Stations and signals.	1	CLO6, CLO24
12	Maintenance and Renewals (P1)	1,3	CLO7, CLO24
13	Maintenance and Renewals (P2)	1,3	CLO7, CLO24
14	Revision.		

92. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical, and	CLO6	Apply engineering design processes for railway design to produce cost-effective solutions.
		CLO7	Meet specified needs for railway design with consideration for social, economic, and environmental aspects.

	other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.		
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.	CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of railway engineering.
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.	CLO24	Achieve an optimum design of railway engineering.

Title	Name	Signature
Course coordinator	Asso. Prof. Dr. Ahmed Hamdy	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	

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	Civil Engineering Department	

Head of Department	Prof. Dr. Sherif Khafaga	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology	
	Civil Engineering Department	

Course Specification Course Code: CVE 4199 Course Title: Graduation Project (1)

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4199			
Year/level	Fourth year / Fifth level			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	1	2		3

2. Course Aims	
No.	Aim
AM5	Make it possible for graduates to pursue continuing education and self-learning, and to qualify for advanced scientific degrees (AM5)
AM7	Work with contemporary field instrumentation, design and perform experiments, and analyze and interpret the results (AM7)
AM3	Providing students with academic and technical skills to design and implement civil engineering projects by utilizing modern technologies through proper planning and participatory work (AM3)
AM4	Strengthening the links between the sectors participating in the process of establishing national civil projects and the graduates of the program in the field of practical training and entrepreneurship and qualifying the graduates to compete for leadership positions in their profession (AM4)

3. Course Learning Outcomes (LOs)	
CLO6	Design preferred alternative based on calculations and/or experimental tools using modern engineering tools.
CLO12	Evaluate the impact of the selected design on public health, safety, welfare and global, cultural, social, economic and environmental factors.
CLO14	Work effectively as a member of the project team providing

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	conducive environment and good leadership
CLO16	Acquire and apply new knowledge, beyond taught courses, using appropriate learning strategies includes updates Codes, Softwares, webinars etc to complete the project
CLO20	Prepare professional technical report including necessary design reports and drawings as well as making an oral

4. Course Contents	
Topics	Week
Identify real-life engineering complex problem addressing various civil engineering specialties [1]	1
Identify real-life engineering complex problem addressing various civil engineering specialties [2]	2
Identify real-life engineering complex problem addressing various civil engineering specialties [3]	3
Identify real-life engineering complex problem addressing various civil engineering specialties [4]	4
Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [1]	5
Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [2]	6
Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [3]	7
Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [4]	8
Mid-term exam	9
Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [5]	10
Recognize alternative designs method/s covering the design viability and evaluation criteria and select the preferred alternative [1]	11
Recognize ethical and professional responsibilities in context of global, economic, environmental and societal	12

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situations [2]	
Work effectively as a member of the project team providing conducive environment and good leadership [1]	13
Practical exam	14
Final exam	15

5. Teaching and Learning methods											
Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning
CLO6	√		√			√				√	
CLO12		√							√	√	√
CLO14									√	√	√
CLO16									√		√
CLO20	√	√	√			√					

6. Teaching and Learning methods of Disabled Students		
No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

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7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Reports	CLO6
3	Quizzes	CLO6
4	Mid-term Exam	CLO6
5	Oral/ Practical Exam	CLO6
6	Final Exam	-----

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Quizzes	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports	20%	20		
	Attendance				-
	Quizzes				
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance	50%	50	10%	10
	Lab. Reports				
	Lab. Activities / Projects			40%	40
	Final oral / practical exam				

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Final Exam		30%	30		
Total		100%	100		

8. List of References

[1] Codes, Text Books, Published Research Papers and Design Manuals relevant to the assigned Project Topic.

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Identify real-life engineering complex problem addressing various civil engineering specialties [1]	AM5, AM7	CLO6, CLO12
2	Identify real-life engineering complex problem addressing various civil engineering specialties [2]	AM5, AM7	CLO6, CLO12
3	Identify real-life engineering complex problem addressing various civil engineering specialties [3]	AM5, AM7	CLO6, CLO12
4	Identify real-life engineering complex problem	AM5,	CLO6,

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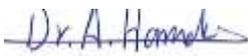
	addressing various civil engineering specialties [4]	AM7	CLO12
5	Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [1]	AM5, AM7	CLO6, CLO12
6	Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [2]	AM5, AM7	CLO6, CLO12
7	Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [3]	AM5, AM7	CLO6, CLO12
8	Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [4]	AM5, AM7, AM3	CLO6, CLO12
9	Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information [5]	AM5, AM7	CLO6, CLO12
10	Recognize alternative designs method/s covering the design viability and evaluation criteria and select the preferred alternative [1]	AM5, AM7	CLO6, CLO12
11	Recognize ethical and professional responsibilities in context of global, economic, environmental and societal situations [2]	AM5, AM7	CLO6, CLO12
12	Work effectively as a member of the project team providing conducive environment and good leadership	AM5, AM7, AM4	CLO6, CLO12

11. Matrix of Program LOs with Course Los

Program Los		Course Los	
PLO3	Apply engineering design processes that meets specified needs.	CLO6	Apply engineering design process in water sedimentation & filtration units, sewage treatment units and sewerage system.
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO12	Practice research techniques and methods of surface and groundwater problems investigation
PLO6	Use creative, innovative, and flexible thinking to respond to new situations.	CLO14	Supervise and monitor implementation of engineering projects
PLO8	Communicate effectively - graphically, verbally and in	CLO16	Communicate effectively in writing of technical report with a range of audiences

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	writing with a range of audiences using contemporary tools.		using contemporary tools.
PLO10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	CLO20	Practice self, lifelong and other learning strategies.

Title	Name	Signature
Course coordinator		
Program Coordinator:	Asso. Dr. Ahmed Hamdy.	
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology-fifth settlement	
	Civil Engineering Department	

Course Specification

Course Code: HUM xx06

Course Title: Legislation and contracts

1. Basic information

Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	HUM xx06			
Year/level	fourth year / first Semester (1 st Semester)			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1	0	3

2. Course Aims

No.	Aim
AM7	Design and perform experiments and analyze and interpret the results (AM7)

3. Course Learning Outcomes (LOs)

CLO16	Communicate effectively verbally and in writing – with a range of audiences using contemporary tools.
CLO31	Deal with project insurance and guarantees.

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	Civil Engineering Department	

4. Course Contents

Topics	Week
Introduction in contracting (1).	1
Introduction in contracting (2).	2
Contract Definition.	3
Engineering Contracts.	4
Project Stake holders and their responsibilities and objectives.	5
Tendering Methods.	6
Contacting stages and the role of each stage.	7
midterm	8
Disputes and resolutions.	9
Egyptian Legislation.	10
Law regulating tenders and auctions promulgated by law no.89 of 1998.	11
Law regulating tenders and auctions promulgated by law no.89 of 1998.	12
Law regulating tenders and auctions promulgated by law no.89 of 1998.	13
Final exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

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CLO16	√		√		√		√				√	
CLO31	√	√	√	√	√	√	√					√

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO16, CLO31
3	Quizzes	CLO16, CLO31
4	Mid-term Exam	CLO16, CLO31
5	Final Exam	CLO16, CLO31

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	---
4	Mid-term Exam	8
5	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	5%	5
	Attendance			5%	5
	Quizzes			10%	10
	Mid-term exam			20%	20

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	Civil Engineering Department	

Practical / Oral	Practical Attendance				
	Lab. Reports				
	Projects				
	practical exam				
Final Exam		60%	60		
Total		100%	100		

8. List of References

- Law regulating tenders and auctions promulgated by law no.89 of 1998.
- The Certified Quality Engineer Handbook 3ed by Conniem
- Construction Methods And Management 8ed by S.w.Nunnally

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction in contracting (1).	7	CLO16, CLO31
2	Introduction in contracting (2).	7	CLO16, CLO31
3	Contract Definition.	7	CLO16, CLO31
4	Engineering Contracts.	7	CLO16, CLO31
5	Project Stake holders and their responsibilities and objectives.	7	CLO16, CLO31
6	Tendering Methods.	7	CLO16, CLO31

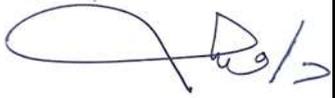
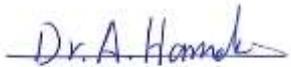
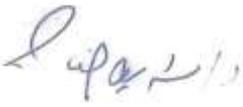
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7	Contacting stages and the role of each stage.	7	CLO16, CLO31
8	Disputes and resolutions.	7	CLO16, CLO31
9	Egyptian Legislation.	7	CLO16, CLO31
10	Law regulating tenders and auctions promulgated by law no.89 of 1998.	7	CLO16, CLO31
11	Law regulating tenders and auctions promulgated by law no.89 of 1998.	7	CLO16, CLO31
12	Law regulating tenders and auctions promulgated by law no.89 of 1998.	7	CLO16, CLO31

11. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively verbally and in writing – with a range of audiences using contemporary tools.
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures.	CLO31	Achieve an optimum design of Steel Structures.

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	Civil Engineering Department	

Title	Name	Signature
Course coordinator	Dr. Medhat Momtaz	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4201	Course Title: Design of reinforced concrete (6)

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4201			
Year/level	Fourth year / fifth level (2 nd Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2		4

2. Course Aims	
No.	Aim
1	Teach the students how to think about and design problems and requirements using scientific methods (AM2)
2	Make the graduates continuing educations and self-learning and to qualify for an advanced scientific degree(AM5)

3. Learning Outcomes (LOs)	
CLO6	Apply engineering design processes to produce cost-effective solutions.
CLO8	Achieve the principles of design within the principles and contexts of sustainable design and development.
CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
CLO24	Achieve an optimum design of Reinforced Concrete elements

4. Course Contents	
Topics	Week

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Introduction to types of water tanks, methods of analysis, and loads	1
Introduction to elevated tank. Expected loads, Methods of analysis, analysis of internal forces	2
Methods of design of water and air section	3
Details of RFT for both open channel, and elevated tanks	4
Introduction to rested on soil tank. Expected loads, Methods of analysis, analysis of internal forces	5
Methods of design of water and air section	6
Details of RFT for rested on soil tank	7
Introduction to underground tank. Expected loads, Methods of analysis, cases of loading, analysis of internal forces	8
Mid term exam	9
Methods of design of water and air section	10
Details of RFT for underground tank	11
Introduction to prestressed RC concrete	12
Required dimensions method of analysis, calculating prestressing forces, allowable stresses, details of RFT	13
Final revision	14
Final exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

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CLO6	√			√			√					
CLO8	√			√			√					
CLO17	√			√						√	√	
CLO24	√			√			√					

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO6, CLO8, CLO17 CLO24
3	Quizzes	
4	Mid-term Exam	CLO6, CLO8, CLO17
5	Practical Exam	
6	Final Exam	CLO6, CLO8, CLO17 CLO24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	weekly
2	Sheets	weekly
3	Quizzes	-
4	Mid-term Exam	9
5	Practical Exam	-
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			10%	10
	Quizzes			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam				
Final Exam		60%	60		
Total		100%	100		

8. List of References
[1] Reynolds, C. E., Steedman, J. C., & Threlfall, A. J. (2007). Reinforced concrete designer's handbook. CRC Press.
[2] Darwin, D., Dolan, C. W., & Nilson, A. H. (2016). Design of concrete structures (Vol. 2). New York, NY, USA:: McGraw-Hill Education.
[3] Wang, C. K., & Salmon, C. G. (1979). Reinforced concrete design
[4] Shetty, M. S., & Jain, A. K. (2019). Concrete Technology (Theory and Practice), 8e. S. Chand Publishing.
[5] Raju, N. K. (2005). Structural Design and Drawing: Reinforced Concrete and Steel. Universities Press.
[6] ECP 205,(2022), Egyptian code of practice for reinforced concrete.
[7] S.S.Ray. (1999), Reinforced Concrete Analysis and Design.
[8] Ghoneim, Mashhour a.,(2008), Design of Reinforced Concrete Structure - Volume 1 - DR. Mashhour A. Ghoneim.

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	Civil Engineering Department	

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

10. Matrix of Course Content with Course LO's

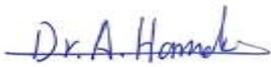
No.	Topics	Aim	LOs
1	Introduction to types of water tanks, methods of analysis, and loads	AM5	CLO17
2	Introduction to elevated tank. Expected loads, Methods of analysis, analysis of internal forces	AM5	CLO17
3	Methods of design of water and air section	AM2,AM5	CLO17, CLO8,CLO6
4	Details of RFT for both open channel, and elevated tanks	AM2,AM5	CLO8,CLO6,CLO17
5	Introduction to rested on soil tank. Expected loads, Methods of analysis, analysis of internal forces	AM5	CLO17
6	Methods of design of water and air section	AM5	CLO17
7	Details of RFT for rested on soil tank	AM2,AM5	CLO8 ,CLO24,CLO17
8	Introduction to underground tank. Expected loads, Methods of analysis, cases of loading, analysis of internal forces	AM2,AM5	CLO8 ,CLO24,CLO17
9	Mid term exam	AM2,AM5	CLO8 ,CLO24,CLO17
10	Methods of design of water and air section	AM2,AM5	CLO8 ,CLO24,CLO17
11	Details of RFT for underground tank	AM2	CLO8 ,CLO24
12	Introduction to prestressed RC concrete	AM2	CLO8 ,CLO24
13	Required dimensions method of analysis, calculating prestressing forces, allowable stresses, details of RFT	AM2,AM5	CLO8 ,CLO24,CLO17
14	Final revision	AM2,AM5	CLO6,CLO8,CLO17,CLO24

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15	Final exam	AM2,AM5	CLO8 ,CLO24,CLO17,CLO6
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11. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO3	1 Apply engineering design processes to produce cost-effective solutions., Meet specified needs with consideration for global, cultural, social, economic, environmental, and ethical aspects and achieve the principles of design within the principles and contexts of sustainable design and development.	CLO6, CLO8	Apply design engineering processes to .produce cost-effective solutions Achieve the principles of design within the principles and contexts of sustainable .design and development
PLO9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO17	Use creative, innovative, and flexible .thinking to respond to new situations
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures..	CLO24	Achieve an optimum design of Reinforced Concrete elements

Title	Name	Signature
Course coordinator	DR. Mamdouh tawakl	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif Khafaga.	

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	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Date of Approval	4/10/2022	
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	Civil Engineering Department	

Course Specification	
Course Code: CVE 4202	Course Title: Steel Structures Design (4)

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4202			
Year/level	fourth year / second Semester (2 nd Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2	0	4

2. Course Aims	
No.	Aim
AM5	Make it possible for graduates to pursue continuing education in steel structures design specialty. (AM5)
AM7	Design and perform experiments and analyze and interpret the results (AM7)

3. Course Learning Outcomes (LOs)	
CLO17	Use creative, innovative, and flexible thinking to respond to new steel design situations.
CLO24	Achieve an optimum design of Steel Structures.
CLO31	Deal with steel project insurance and guarantees.

4. Course Contents	
Topics	Week
Studying of all kinds of used bases.	1
Design of hinged base.	2
Details of bases.	3

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Examples of bases.	4
Studying all kinds of cold formed sections.	5
Determine the effective parts for cold formed section.	6
Design of roof purlin using cold formed section.	7
midterm	8
Design of roof purlin using cold formed section and tie rod (one line of tie rod).	9
Design of roof purlin using cold formed section and tie rod (two line of tie rod).	10
Studying the composite section and its properties.	11
Design of composite beam with temporary shoring.	12
Design of composite beam without temporary shoring.	13
Final exam	15

5. Teaching and Learning methods												
Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO17	√	√	√	√		√	√				√	√
CLO24			√		√	√	√					√
CLO31								√			√	

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6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO17, CLO24, CLO31
3	Quizzes	CLO17, CLO24, CLO31
4	Mid-term Exam	CLO17, CLO24, CLO31
5	Final Exam	CLO17,CLO24,CLO31

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	---
4	Mid-term Exam	8
5	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	5%	5
	Attendance			5%	5
	Quizzes			10%	10
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Projects				

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	practical exam				
Final Exam		60%	60		
Total		100%	100		

8. List of References

- [1] Steel Structures design and Behavior G. Salman& E. Johnson, Fifth Edition 2009.
 [2] Structural Steel Design, Jack C. McCormack, fourth Edition, 2008.
 [3] Egyptian Code of Practice ASD, LRFD, 2010.
 [4] (AISC 360-16) ,2019

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

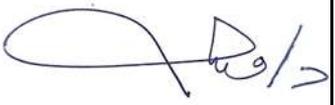
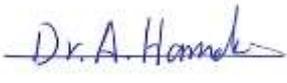
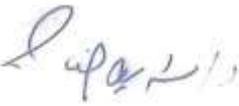
10. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Studying of all kinds of used bases.	5,7	CLO17,CLO24,CLO31
2	Design of hinged base.	5,7	CLO17,CLO24,CLO31
3	Details of bases.	5,7	CLO17,CLO24,CLO31
4	Examples of bases.	,7	,CLO24,CLO31
5	Studying all kinds of cold formed sections.	5,7	CLO17,CLO31
6	Determine the effective parts for cold formed section.	5,7	CLO17,CLO24,CLO31
7	Design of roof purlin using cold formed section.	5,7	CLO17,CLO24,
8	Design of roof purlin using cold formed section and tie rod (one line of tie rod).	5,7	CLO17, CLO31
9	Design of roof purlin using cold formed section and tie rod (two line of tie rod).	7	,CLO24,CLO31
10	Studying the composite section and its properties.	5,7	CLO17,CLO24,CLO31
11	Design of composite beam with temporary shoring.	5,7	CLO17,CLO24,CLO31
12	Design of composite beam without temporary shoring.	5,7	CLO17, CLO31

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11. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO9	Use creative, innovative, and flexible thinking to respond to new situations. Acquire entrepreneurial and leadership skills to anticipate new situations.	CLO17	Use creative, innovative, and flexible thinking to respond to new steel design situations.
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures.	CLO24	Achieve an optimum design of Steel Structures.
PLO15	Deal with bidding, contract and financial issues. Deal with project insurance and guarantees.	CLO31	Deal with steel project insurance and guarantees.

Title	Name	Signature
Course coordinator	Dr. Medhat Momtaz	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif khafaga.	
Date of Approval	4/10/2022	

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	Civil Engineering Department	

Course Specification	
Course Code: CVE 4203	Course Title: Structural Analysis (6)

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4203			
Year/level	fourth year / fifth level (2 nd Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2		5

2. Course Aims	
No.	Aim
1	Give the students the knowledge and expertise to analysis of structure using several techniques (AM3).
2	Make it possible for graduates to pursue continuing education and self-learning, and to qualify for advanced scientific degrees in structural analysis (AM5).

3. Course Learning Outcomes	
CLO1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics,

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No of weeks	Topics
1	Approximate Method on Beams
2	Approximate Method on Beams
3	Approximate Method on Portal Frames
4	Approximate Method on Portal Frames
5	Approximate Method on Frames
6	Approximate Method on Frames
7	Approximate Method on Trusses
8	Approximate Method on Trusses
9	Mid-term Exam
10	Approximate Method on Trussed Frame
11	Normal Stresses on Shell
12	Shear Stresses on Shell
13	Bending Moment on Shell
14	Folded Plates
15	Final Exam

4. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

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CLO1	√	√		√								
CLO2	√	√		√								
CLO22							√			√	√	

5. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

6. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Reports / Sheets	CLO1, CLO2, CLO22
3	Quiz 1 / Quiz 2	CLO1, CLO2, CLO22
4	Mid-term Exam	CLO1, CLO2, CLO22
5	Oral/ Practical Exam	
6	Final Exam	CLO1, CLO2, CLO22

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	-----
4	Mid-term Exam	9
5	Oral/ Practical Exam	
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	10%	10
	Attendance			-	
	Quiz 1 / Quiz 2			10%	10
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

7. List of References
[1] Blaauwendraad, J., & Hoefakker, J. H. (2014). Structural shell analysis. Solid Mechanics and its Applications, 200.
[2] Megson, T. H. G. (2019). Structural and stress analysis. Butterworth-Heinemann.
[3] Benhassine, A., Chouiter, M. I., Ali, M. K., Kacem-Chaouche, N., Merazig, H., Bencharif, M., & Belfaitah, A. (2022). New Cd (II) complex derived from (1-methylimidazol-2-yl) methanol: Synthesis, crystal structure, spectroscopic study, DFT and TD-DFT calculations, antimicrobial activity and free-radical scavenging capacity. Journal of Molecular Structure, 1257, 132583.
[4] Spillers, W. R., & MacBain, K. M. (2009). Structural optimization. Springer Science & Business Media.

8. Facilities required for teaching and learning
Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

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	Civil Engineering Department	

9. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Approximate Method on Beams	Aim3,Aim5	CLO1, CLO2, CLO22
2	Approximate Method on Beams	Aim3,Aim5	CLO1, CLO2, CLO22
3	Approximate Method on Portal Frames	Aim3,Aim5	CLO1, CLO2, CLO22
4	Approximate Method on Portal Frames	Aim3,Aim5	CLO1, CLO2, CLO22
5	Approximate Method on Frames	Aim3,Aim5	CLO1, CLO2, CLO22
6	Approximate Method on Frames	Aim3,Aim5	CLO1, CLO2, CLO22
8	Approximate Method on Trusses	Aim3,Aim5	CLO1, CLO2, CLO22
9	Approximate Method on Trusses	Aim3,Aim5	CLO1, CLO2, CLO22
10	Approximate Method on Trussed Frame	Aim3,Aim5	CLO1, CLO2, CLO22
11	Normal Stresses on Shell	Aim3,Aim5	CLO1, CLO2, CLO22
12	Shear Stresses on Shell	Aim3,Aim5	CLO1, CLO2, CLO22
13	Bending Moment on Shell	Aim3,Aim5	CLO1, CLO2, CLO22
14	Folded Plates	Aim3,Aim5	CLO1, CLO2, CLO22

10. Matrix of Program LOs with Course Los

Program Los		Course Los	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
		CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
PLO11	Use either numerical techniques or physical measurements 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.	CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics,

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	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Title	Name	Signature
Course coordinator	Dr. Khaled samy	
Program Coordinator:		
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	/09/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification Course Code: CVE4261 Course Title: Earthquake Engineering

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4261			
Year/level	Fourth year / Fifth level			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	4

2. Course Aims	
No.	Aim
1	Teach the students to practice the methodology in thinking and describing concrete earthquake design problems (AM2).
2	Make the graduates continuing educations and self-learning and to qualify for an advanced scientific degree(AM5)

3. Learning Outcomes (LOs)	
CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
CLO24	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures.
CLO31	Deal with project insurance and guarantees.

4. Course Contents	
Topics	Week
Introduction on earthquake engineering	1
Causes and effects of earthquakes	2
Quantification and magnitude of earthquakes	3

Factors affecting structural seismic response	4
Earthquake design philosophy and limit states	5
Determination of earthquake forces by code provisions	6
Free vibration analysis of multi-degrees of freedom systems,	7
Response spectrum analysis of multi-degrees of freedom systems	8
Mid term exam	9
Design response spectrum curves	10
Applications.	11
Case study (part1)	12
Case study (part2)	13
Final revision	14
Final exam	15

5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO17			√		√	√	√				√	√
CLO24	√	√	√	√	√	√	√					√
CLO31	√	√	√	√		√	√				√	√

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	Civil Engineering Department	

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO17, CLO24,CLO31
3	Quizzes	-
4	Mid-term Exam	CLO17, CLO24,CLO31
5	Practical Exam	
6	Final Exam	CLO17, CLO24,CLO31

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	weekly
3	Quizzes	-
4	Mid-term Exam	9
5	Practical Exam	-----
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			10%	10

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	Quizzes			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam				
Final Exam		60%	60		
Total		100%	100		

8. List of References

- (1) Hu, Y. X., Liu, S. C., & Dong, W. (1996). Earthquake engineering. CRC Press.
- (2) Scawthorn, C., & Chen, W. F. (Eds.). (2002). Earthquake engineering handbook. CRC press.
- (3) Sucuoğlu, H., Akkar, S., Halûk, S., & Sinan, A. (2014). Basic earthquake engineering. Basic Earthquake Engineering.
- (4) Falcone, R., Lima, C., & Martinelli, E. (2020). Soft computing techniques in structural and earthquake engineering: a literature review. *Engineering Structures*, 207, 110269.

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

10. Matrix of Course Content with Course LO's

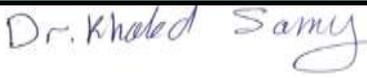
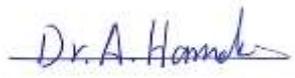
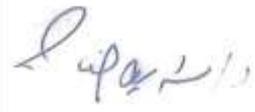
No.	Topics	Aim	LOs
1	Introduction on earthquake engineering	AM5	CLO17
2	Causes and effects of earthquakes	AM2	CLO24
3	Quantification and magnitude of earthquakes	AM2,AM5	CLO24,CLO17
4	Factors affecting structural seismic response	AM2,AM5	CLO24,CLO17,CLO31
5	Earthquake design philosophy and limit states	AM2,AM5	CLO24,CLO17
6	Determination of earthquake forces by code provisions	AM2	CLO24
7	Free vibration analysis of multi-degrees of freedom systems,	AM2,AM5	CLO24,CLO17
8	Response spectrum analysis of multi-degrees of freedom systems	AM2	CLO24
9	Mid term exam	AM5	CLO17
10	Design response spectrum curves	AM5	CLO17
11	Applications.	AM2	CLO24
12	Case study (part1)	AM2,AM5	CLO24,CLO17,CLO31
13	Case study (part2)	AM2	CLO24
14	Practical exam	AM2,AM5	-
15	Final exam	AM2,AM5	CLO24,CLO17,CLO31

11. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO9	use of innovative and innovative thinking and gain entrepreneurship and leadership skills to engage and respond to new positions.	CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
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,	CLO24	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures.

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	Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.		
PLO15	Deal with bidding, contract and financial issues including project insurance and guarantees.	CLO31	Deal with project insurance and guarantees.

Title	Name	Signature
Course coordinator	Dr. Khaled samy	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE4262	Course Title: Durability of Concrete

12. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE4262			
Year/level	Second year / Fifth level (1 st Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

13. Course Aims	
No.	Aim
AM2	Teach the students to practice the methodology in evaluating defects in concrete structure to restoration or maintenance of concrete structures
AM3	Give students with technical skills to estimate the reasons for the occurrence of defect in concrete structures (cracks, ...)
AM7	Work with the contemporary field instruments, perform experiments, analyze and interpret the results

14. Course Learning Outcomes (CLOs)	
CLO12	Develop and conduct appropriate experimentation to evaluate the defects in concrete structure
CLO23	Use destructive and non-destructive tests to applying a full range of civil engineering techniques to evaluate the concrete structure
CLO24	Manage construction processes; address construction defects to restoration or maintenance of concrete structures
CLO26	Manage construction processes; address construction defects to restoration or maintenance of concrete structures

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1. Course Contents	
Topics	Week
Concrete Durability	1
Concrete structural restoration	2
Maintenance of concrete structures	3
The reasons for the occurrence of defect in concrete structures	4
The reasons for the occurrence of defect in concrete structures	5
The reasons of cracks in concrete structure	6
The reasons of cracks in concrete structure	7
How to evaluate defects in concrete structure	8
Midterm exam	9
How to evaluate defects in concrete structure	10
Destructive tests	11
non-destructive tests	12
Restoration of beam and columns	13
Restoration of beam and columns	14
Final Exam	15

2. Teaching and Learning methods	
Course learning Outcomes (LOs)	Teaching and Learning Methods

	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO12	√	√		√								
CLO23	√	√		√			√			√	√	
CLO24	√	√		√			√			√	√	
CLO26							√			√	√	

3. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

4. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO12,23,24,26
3	Mid-term Exam	CLO12,23,26
4	Final Exam	CLO12,23,24,26

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly

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3	Mid-term Exam	9
4	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	15%	10
	Attendance			5%	5
	Mid-term exam			20%	20
Final Exam		60%	60		
Total		100%	100		

5. List of References
[1] Spence, William P., and Eva Kultermann. Construction materials, methods and techniques. Cengage Learning, 2016.
[2] Ross, Carl TF, and A. Chilver. Strength of materials and structures. Elsevier, 1999.
[3] Allen, Edward, and Joseph Iano. Fundamentals of building construction: materials and methods. John Wiley & Sons, 2019.
[4] Hibbeler, Russell Charles. Mechanical of materials. 2012.
[5] Goodno, Barry J., and James M. Gere. Mechanics of materials. Cengage Learning, 2020.

6. Facilities required for teaching and learning
Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Data show

Laboratory Usage

7. Matrix of Course Content with Course LO's

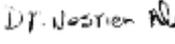
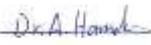
Weeks	Topics	Aim	LOs
1	Concrete Durability	AM2, AM3	CLO12
2	Concrete structural restoration	AM2, AM3	CLO12,CLO23,CLO24
3	Maintenance of concrete structures	AM2, AM3	CLO12,CLO23,CLO24
4	The reasons for the occurrence of defect in concrete structures	AM2, AM3	CLO12,CLO23,CLO24
5	The reasons for the occurrence of defect in concrete structures	AM2, AM3	CLO12,CLO23,CLO24
6	The reasons of cracks in concrete structure	AM2, AM3	CLO12,CLO26,CLO24
7	The reasons of cracks in concrete structure	AM2, AM3	CLO12,CLO26,CLO24
8	How to evaluate defects in concrete structure	AM2, AM3	CLO12, CLO24,CLO26
9	Midterm exam	AM2, AM3	CLO12,CLO26,CLO24
10	How to evaluate defects in concrete structure	AM2, AM3	CLO12,CLO26,CLO24
11	Destructive tests	AM2, AM3	CLO12, CLO26
12	non-destructive tests	AM2, AM3	CLO12, CLO26
13	Restoration of beam and columns	AM2, AM3	CLO12, CLO24,CLO26
14	Restoration of beam and columns	AM2, AM3	CLO12, CLO24,CLO26

8. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO12	Develop and conduct appropriate experimentation to evaluate the defects in concrete structure
PLO11	Select appropriate and sustainable technologies for construction of buildings. Infrastructures and water structures; using either numerical techniques or physical measurements and/or	CLO23	Use destructive and non-destructive tests to applying a full range of civil engineering techniques to evaluate the concrete structure

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	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		
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.	CLO24	Manage construction processes; address construction defects to restoration or maintenance of concrete structures
PLO13	Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impact of projects.	CLO26	Manage construction processes; address construction defects to restoration or maintenance of concrete structures

Title	Name	Signature
Course coordinator	Dr. Nesrin Ali	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Sherif Khafaga	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification
Course Code: CVE 4263 Course Title: Vacuum steel structures

9. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4263			
Year/level	Fourth year / Fifth level (2st Semester)			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	3

10. Course Aims	
No.	Aim
1	Make it possible for graduates to pursue continuing education in steel structures design specialty. (AM5)
2	Design and perform experiments and analyze and interpret the results (AM7)

11. Course Learning Outcomes	
CLO1	Identify steel types and its properties.
CLO6	Apply engineering design processes to produce cost-effective solutions for steel structures.
CLO17	Use creative, innovative, and flexible thinking to respond to new steel design situations.
CLO24	Achieve an optimum design of Steel Structures.
CLO31	Deal with steel project insurance and guarantees.

No of week	Topics
1	Introduction : Space Steel Structures
2	Space roof trusses (double layer grids)
3	Review of the development of various types of steel double layer grids
4	Analysis of double layer grids, Construction of space roof and deck systems
5	Tall buildings (high rise buildings): Building function, Structural system to resist gravity loads
6	Structural system to resist lateral loads, Energy dissipation system, Method of analysis
7	Construction details. High voltage steel towers and antenna towers
8	Steel towers: Function and classification, Analysis and design, Construction details, Safety and serviceability
9	Midterm exam
10	Cable supported structures: Development and classification, Material
11	Cable supported structures equipment, Analysis and design, Construction details, Safety and serviceability
12	Off shore structures: Review of the development of various types of steel off shore structures
13	Structural system to resist gravity loads, Structural system to resist lateral loads, Method of analysis, Construction details
14	Revision
15	Final Exam

12. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods
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	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO1	√					√	√			√		
CLO6	√		√			√	√			√		
CLO17	√		√			√	√			√	√	
CLO24			√			√	√			√		
CLO31								√			√	

13. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

14. Students' Assessment

7.1 Students' Assessment Method		
No.	Assessment Method	LOs
1	Attendance	-----
2	Reports / Sheets	CLO1, CLO6, CLO17, CLO24, CLO31
3	Quiz 1 / Quiz 2	CLO1, CLO6, CLO17, CLO24
4	Mid-term Exam	CLO1, CLO6, CLO17, CLO24
5	Oral/ Practical Exam	-----
6	Final Exam	CLO1, CLO6, CLO17, CLO24, CLO31

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	-----
4	Mid-term Exam	9
5	Oral/ Practical Exam	-----
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	5%	5
	Attendance			5%	5
	Quiz 1 / Quiz 2			10%	10
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

15. List of References

- [1] Steel Structures design and Behavior G. Salman & E. Johnson, Fifth Edition 2009.
 [2] Structural Steel Design, Jack C. McCormack, fourth Edition, 2008.
 [3] Egyptian Code of Practice ASD, LRFD, 2010.
 [4] (AISC 360-16) ,2019

16. Facilities required for teaching and learning

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	Civil Engineering Department	

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

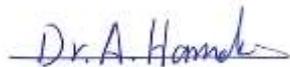
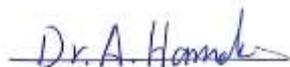
17. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction : Space Steel Structures	Aim5, Aim7	CLO1, CLO17
2	Space roof trusses (double layer grids)	Aim5, Aim7	CLO1, CLO17
3	Review of the development of various types of steel double layer grids	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
4	Analysis of double layer grids, Construction of space roof and deck systems	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
5	Tall buildings (high rise buildings): Building function, Structural system to resist gravity loads	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
6	Structural system to resist lateral loads, Energy dissipation system, Method of analysis	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
7	Construction details. High voltage steel towers and antenna towers	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
8	Steel towers: Function and classification, Analysis and design, Construction details, Safety and serviceability	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
10	Cable supported structures: Development and classification, Material	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
11	Cable supported structures equipment, Analysis and design, Construction details, Safety and serviceability	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24, CLO31
12	Off shore structures: Review of the development of various types of steel off shore structures	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24
13	Structural system to resist gravity loads, Structural system to resist lateral loads, Method of analysis, Construction details	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24, CLO31
14	Practical Exam	Aim5, Aim7	CLO1, CLO6, CLO17, CLO24, CLO31

18. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Identify steel types and its properties.
PLO3	Apply engineering design processes to produce cost-effective solutions. Meet specified needs with consideration for global, cultural, social, economic, environmental, and ethical aspects. Achieve the principles of design within the principles and contexts of sustainable design and development.	CLO6	Apply engineering design processes to produce cost-effective solutions for steel structures.
PLO9	Use creative, innovative, and flexible thinking to respond to new situations. Acquire entrepreneurial and leadership skills to anticipate new situations.	CLO17	Use creative, innovative, and flexible thinking to respond to new steel design situations.
PLO12	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures.	CLO22	Achieve an optimum design of Steel Structures.
PLO15	Deal with bidding, contract and financial issues. Deal with project insurance and guarantees.	CLO31	Deal with steel project insurance and guarantees.

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Title	Name	Signature
Course coordinator	Dr. Medhat Momtaz	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Dr. Ahmed Hamdy	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4264	Course Title: Soil Improvement

19. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4264			
Year/level	Fourth year / Fifth level (2 st Semester)			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1		3

20. Course Aims	
No.	Aim
1	Give students with technical skills to estimate physical and mechanical properties of soil (AM3).
2	Make it possible for graduates to pursue continuing education in geotechnical engineering and self-learning. (AM5)

21. Course Learning Outcomes	
CLO3	Conduct appropriate soil experimentation to draw conclusions.
CLO10	Use physical measurements by applying a full range of civil engineering concepts and techniques of Soil Mechanics.
CLO23	Use testing specified with soil by applying a full range of civil engineering concepts and techniques.
CLO24	Achieve an optimum design of Foundations and Earth Retaining Structures.

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No of weeks	Topics
1	Introduction : soil improvement
2	Engineering needs for soil improvement: Geotechnical problems with soft and loose soils
3	Soil improvement techniques
4	Mechanical stabilization densification: Deep and shallow compaction
5	Consolidation analysis, Preloading with and without drains
6	Design and construction of soil reinforcement: History of soil reinforcement
7	Reinforcing materials, Physical and mechanical properties, Utilization methods
8	Advantages and limitations, Reinforcement techniques
9	Midterm exam
10	Analysis and design of reinforced embankments constructed on soft soils
11	Analysis and design of reinforced earth walls
12	Grouting: grout properties, Grouting techniques
13	Criterion for choosing suitable technique for soil improvement
14	Revision
15	Final Exam

22. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods
---------------------------------------	--------------------------------------

	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO3				√	√							
CLO10	√	√	√	√	√							
CLO23	√		√	√	√	√	√			√	√	
CLO24	√	√	√	√		√	√			√	√	

23. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

24. Students' Assessment

7.1 Students' Assessment Method		
No.	Assessment Method	LOs
1	Attendance	-----
2	Reports / Sheets	CLO3, CLO10, CLO23, CLO24
3	Quiz 1 / Quiz 2	
4	Mid-term Exam	CLO10, B1.3, CLO24
5	Oral/ Practical Exam	
6	Final Exam	CLO3, CLO10, CLO23, CLO24

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	20%	20
	Attendance			-	
	Quiz 1 / Quiz 2				
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

25. List of References

- [1] Donald P., Coduto, "Geotechnical Engineering: Principles and Practices", Prentice Hall 1999 (ISBN: 0135763800).
- [2] David F., McCarthy, "Essentials of Soil Mechanics and Foundations: Basic Geotechnics", Prentice Hall, ISBN: 0131145606(2007).
- [3] W.L.Schroeder, Stephen Dickenson and C. Warrington, "Soils in Construction, 5/E", Prentice Hall, ISBN: 0130489174(2004).
- [4] Suleiman M.T. (2009), lecture handouts for the CE 361: Geotechnical Engineering course, Lafayette collage, Easton, Pennsylvania.

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26. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

27. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction : soil improvement	Aim3, Aim5	CLO23, CLO24
2	Engineering needs for soil improvement: Geotechnical problems with soft and loose soils	Aim3, Aim5	CLO23, CLO24
3	Soil improvement techniques	Aim3, Aim5	CLO23, CLO24
4	Mechanical stabilization densification: Deep and shallow compaction	Aim3, Aim5	CLO3, CLO10, CLO23, CLO24
5	Consolidation analysis, Preloading with and without drains	Aim3, Aim5	CLO23, CLO24
6	Design and construction of soil reinforcement: History of soil reinforcement	Aim3, Aim5	CLO23, CLO24
7	Reinforcing materials, Physical and mechanical properties, Utilization methods	Aim3, Aim5	CLO3, CLO10, CLO23, CLO24
8	Advantages and limitations, Reinforcement techniques	Aim3, Aim5	CLO3, CLO10, CLO23, CLO24
10	Analysis and design of reinforced embankments constructed on soft soils	Aim3, Aim5	CLO23, CLO24
11	Analysis and design of reinforced earth walls	Aim3, Aim5	CLO3, CLO10, CLO23, CLO24
12	Grouting: grout properties, Grouting techniques	Aim3, Aim5	CLO3, CLO10, CLO23, CLO24
13	Criterion for choosing suitable technique for soil	Aim3, Aim5	CLO3, CLO10, CLO23, CLO24

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	Civil Engineering Department	

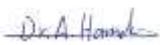
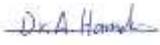
	improvement		
14	Practical Exam		

28. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
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	Conduct appropriate soil experimentation to draw conclusions.
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.	CLO23	Use testing specified with soil by applying a full range of civil engineering concepts and techniques.
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	CLO24	Achieve an optimum design of Foundations and Earth Retaining Structures.

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	emerging field relevant to the discipline.		
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Title	Name	Signature
Course coordinator	Dr. Nesrin Ali Morsey	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Ahmed Hamdy	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4265	Course Title: Traffic management and operation systems

29. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4265			
Year/level	Fourth year / 5 th level (2 nd Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	-	4

30. Course Aims	
No.	Aim
AM1	Provide an engineer professional that is proficient in traffic engineering.
AM3	Give the students the knowledge about the fundamentals of the traffic engineering to plan transportation and traffic engineering projects using contemporary techniques.

31. Course Learning Outcomes (CLOs)	
CLO6	Apply engineering design processes for traffic operation systems to produce cost-effective solutions.
CLO7	Meet specified needs for traffic operation systems with consideration for social, economic, and environmental aspects.
CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of traffic engineering.
CLO24	Achieve an optimum design of traffic operation systems.

32. Course Contents

Week No.	Topics
1	Introduction: Definition, Objectives of traffic management
2	Traffic planning and management process
3	Traffic operation indicators
4	One way streets
5	Associated traffic signal
6	Prevent left turns
7	Tidal system for traffic
8	Indicators of public transport operation
9	MidTerm Exam
10	Improved traffic, bicycle and pedestrian movement
11	Parking control (P1)
12	Parking control (P2)
13	Improving heavy goods transportation services
14	Revision.
15	Final Exam.

33. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO6	√	√	√	√	-	√	-	-	-	√	√	-

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CLO7	√	√	-	√	-	-	-	-	-	√	√	-
CLO22	√	-	√	√	-	√	√	-	-	√	√	-
CLO24	-	-	-	√	-	√	√	√	-	√	√	-

34. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

35. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-----
2	Reports	CLO6, CLO7, CLO22, CLO24
3	Sheets	CLO6, CLO7, CLO22, CLO24
4	Quiz 1 / Quiz 2	-----
5	Mid-term Exam	CLO6, CLO7, CLO22, CLO24
6	Oral/ Practical Exam	-----
7	Final Exam	CLO6, CLO7, CLO22, CLO24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports	40%	40	5%	5
	Sheets			15%	15
	Attendance			-	-
	Quiz 1 / Quiz 2			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance			-	-
	Lab. Reports			-	-
	Lab. Activities / Projects			-	-
	Final oral / practical exam			-	-
Final Exam	Written exam	60%	60	60%	60
Total		100%	100	100	100

36. List of References

- [1] Egyptian code of practice for airport and highway construction and Bridges, Cairo, 2020.
- [2] Mannering, F.L. and Kilareski, W.P., "Principles of Highway Engineering and Traffic Analysis", John Wiley & Sons, 7th edition, New York, 2020.
- [3] Garber N. J. and Hoel, L. A., Traffic and Highway Engineering, 4th Edition, 2009.
- [4] Mahmoud Tawfik Salem. (1985) "Transportation and Traffic Engineering".

37. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

38. Matrix of Course Content with Course LO's

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

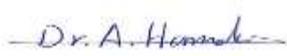
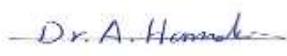
Week No.	Topics	Aim	LOs
1	Introduction: Definition, Objectives of traffic management	1	CLO24
2	Traffic planning and management process	1	CLO7, CLO24
3	Traffic operation indicators	1	CLO7, CLO22, CLO24
4	One way streets	1,3	CLO7, CLO22, CLO24
5	Associated traffic signal	1,3	CLO6, CLO22, CLO24
6	Prevent left turns	1,3	CLO6, CLO7, CLO22, CLO24
7	Tidal system for traffic	1	CLO22, CLO24
8	Indicators of public transport operation	1	CLO6, CLO7, CLO24
10	Improved traffic, bicycle and pedestrian movement	1,3	CLO6, CLO7, CLO22, CLO24
11	Parking control (P1)	1,3	CLO6, CLO7, CLO24
12	Parking control (P2)	1,3	CLO6, CLO7, CLO24
13	Improving heavy goods transportation services	1,3	CLO7, CLO24
14	Revision.		

39. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
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.	CLO6	Apply engineering design processes for traffic operation systems to produce cost-effective solutions.
		CLO7	Meet specified needs for traffic operation systems with consideration for social, economic, and environmental aspects.
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	CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of traffic engineering.

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	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

	range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.		
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.	CLO24	Achieve an optimum design of traffic operation systems.

Title	Name	Signature
Course coordinator	Asso. Prof. Dr. Ahmed Hamdy	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif Khafaga	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4266	Course Title: Environmental Engineering

40. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4266			
Year/level	fourth year / fifth Level (2 nd Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

41. Course Aims	
No.	Aim
AM1	Provide an engineer able to practice different methods of designing the units of water supply system, included in the course. (AM1).
AM2	Teach the students scientific methods to think and solve design problems of water supply system units, included in the course, to meets to present and future requirements. (AM2).

42. Learning Outcomes (LOs)	
CLO4	Analyze data of population and water consumption to draw conclusions.
CLO6	Apply engineering design process in collection, storage and Disinfection works to produce low cost solutions.
CLO10	Utilize health and safety for potable water.
CLO16	Communicate effectively were student by verbal and retain method.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

43. Course Contents	
Topics	Week
Introduction	1
Waste water systems & water supply system.	2
Introduction to water supply system Solid waste management.	3
Water resources and supply works.	4
Preliminary studies for water supply works, Collection works, Water purification.	5
Storage works. Water distribution and networks.	6
Water distribution and networks.	8
Wastewater systems: Wastewater sources, Sewerage systems.	9
Wastewater and sludge treatment, Disposal and reuse.	10
Solid waste management: Collection, Handling, Separation.	11
Solid waste management: treatment & Disposal.	12
Solid waste management: Recycling and reuse.	13
Solid waste management: Recycling and reuse.	14
Final exam	15

44. Teaching and Learning methods													
Course learning Outcomes (LOs)	Teaching and Learning Methods												
		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Lectures (face to face / online)</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Presentation / Movies</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Discussions</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Tutorials</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Practical and lab. Experiments</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Problem Solving</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Brain Storming</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Projects and Team Working</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Site Visits</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Research / Reports</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Self-learning</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Modeling and Simulation</td> </tr> </table>	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning
Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation		

CLO4	√		√	√		√						
CLO6	√		√	√		√				√		
CLO10	√		√			√						
CLO16	√		√	√		√				√	√	

45. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

46. Students' Assessment

7.1 Students' Assessment Method		
No.	Assessment Method	Los
1	Assessment Method	-----
2	Attendance	CLO4,6,16
3	Sheets	CLO4,6,16
4	Quizzes	CLO6,16
6	Mid-term Exam	CLO4,6,10,16

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	4 & 10
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights

Teacher Opinion	sheets	40%	40	10%	10
	Attendance			-	
	Quizzes			10%	10
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam				
Final Exam		60%	60		
Total		100%	100		

47. List of References

- [1] Khidirov, Sanatjon, et al. "Exploration of the hydraulic structure of the water supply facilities operation mode and flow." E3S Web of Conferences. Vol. 264. EDP Sciences, 2021.
- [2] Rajmohan, Kunju Vaikarar Soundararajan, et al. "Plastic pollutants: effective waste management for pollution control and abatement." Current Opinion in Environmental Science & Health 12 (2019): 72-84.
- [3] Water Supply Engineering, Dr.B.C punmia, B-i/10.
- [4] Water Supply & Waste water Engineering, A.K.Upadhya, B-i/12.
- [5] Water supply Engineering, P.N.Modi, B-i/22.

48. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Data show

Laboratory Usage

49. Matrix of Course Content with Course LO's

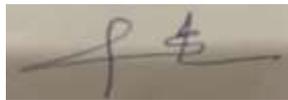
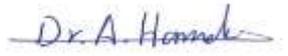
No.	Topics	Aim	Los
1	Introduction	AM2
2	Waste water systems & water supply system.	AM2	CLO4,16
3	Introduction to water supply system Solid waste management.	AM2	CLO4,16
4	Water resources and supply works.	AM2
5	Preliminary studies for water supply works, Collection works, Water purification.	AM2	CLO6,10,16
6	Storage works. Water distribution and networks.	AM1, AM2	CLO6,16
7	Water distribution and networks.	AM1, AM2	CLO4,6,10,16
8	Introduction of wastewater systems	AM1, AM2	CLO6,10,16
9	Mid-term exam	AM1	CLO4,6,10,16
10	Wastewater and sludge treatment.	AM2	CLO16
11	Disposal and reuse.	AM1	CLO4,6,10,16
12	Solid waste management: Collection, Handling, Separation.	AM1	CLO16
13	Solid waste management: treatment, Disposal, Recycling and reuse.	AM1	CLO10,16
14	Solid waste management: Recycling and reuse.	AM1	CLO10,16
15	Final exam	AM1, AM2	CLO4,6,10,16

50. Matrix of Program LOs with Course Los

Program Los		Course Los	
PLO2	Analyze and interpret data to evaluate findings.	CLO4	Analyze data of population and water consumption to draw conclusions.
PLO3	Apply engineering design	CLO6	Apply engineering design process in

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

	processes that meets specified needs.		collection, storage and Disinfection works to produce low cost solutions.
PLO4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	CLO10	Utilize health and safety for potable water.
PLO8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO16	Communicate effectively were student by verbal and retain method.

Title	Name	Signature
Course coordinator	Dr. Salma Abdel Mageed.	
Program Coordinator:	Asso. Dr. Ahmed Hamdy.	
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 3205	Course Title: Transportation Planning and Traffic Engineering

51. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 3205			
Year/level	Third year / 4 th level			(2 nd Semester)
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2		6

52. Course Aims	
No.	Aim
AM1	Provide an engineer professional that is proficient in traffic engineering.
AM3	Give the students the knowledge about the fundamentals of the traffic engineering to plan transportation and traffic engineering projects using contemporary techniques.

53. Course Learning Outcomes (CLOs)	
CLO6	Apply engineering design processes for traffic design to produce cost-effective solutions.
CLO7	Meet specified needs for traffic design with consideration for social, economic, and environmental aspects.
CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of traffic engineering.
CLO24	Achieve an optimum design of traffic engineering.

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	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

54. Course Contents	
Week No.	Topics
1	Introduction: Importance of Transportation, Road Classification.
2	Driver, Vehicle, and Road Characteristics: The Human Response Process, Braking Distance, Sight Distance.
3	Traffic Engineering Studies: Speed studies.
4	Traffic Engineering Studies: Continue of speed studies.
5	Traffic Engineering Studies: Volume studies
6	Traffic Engineering Studies: Continue of volume studies.
7	Traffic flow characteristics.
8	Highway capacity.
9	MidTerm Exam
10	Traffic control (P1): intersection control.
11	Traffic control (P2): traffic signs and road marking.
12	Parking.
13	Trip Generation techniques and methods.
14	Trip distribution methods.
15	Final Exam.

55. Teaching and Learning methods													
Course learning Outcomes (LOs)	Teaching and Learning Methods												
		<table border="1"> <tr> <td>Lectures (face to face / online)</td> <td>Presentation / Movies</td> <td>Discussions</td> <td>Tutorials</td> <td>Practical and lab. experiments</td> <td>Problem Solving</td> <td>Brain Storming</td> <td>Projects and Team Working</td> <td>Site Visits</td> <td>Research / Reports</td> <td>Self-learning</td> <td>Modeling and Simulation</td> </tr> </table>	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning
Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation		

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

CLO6	√	√	√	√	-	√	-	-	-	√	√	-
CLO7	√	√	-	√	-	-	-	-	-	√	√	-
CLO22	√	-	√	√	-	√	√	-	-	√	√	-
CLO24	-	-	-	√	-	√	√	√	-	√	√	-

56. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

57. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-----
2	Reports	CLO6, CLO7, CLO22, CLO24
3	Sheets	CLO6, CLO7, CLO22, CLO24
4	Quiz 1 / Quiz 2	-----
5	Mid-term Exam	CLO6, CLO7, CLO22, CLO24
6	Oral/ Practical Exam	-----
7	Final Exam	CLO6, CLO7, CLO22, CLO24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-

6	Final Exam	15
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7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports	40%	40	5%	5
	Sheets			15%	15
	Attendance			-	-
	Quiz 1 / Quiz 2			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance			-	-
	Lab. Reports			-	-
	Lab. Activities / Projects			-	-
	Final oral / practical exam			-	-
Final Exam	Written exam	60%	60	60%	60
Total		100%	100	100	100

58. List of References

- [1] Egyptian code of practice for airport and highway construction and Bridges, Cairo, 2020.
- [2] Mannering, F.L. and Kilareski, W.P., "Principles of Highway Engineering and Traffic Analysis", John Wiley & Sons, 7th edition, New York, 2020.
- [3] Garber N. J. and Hoel, L. A., Traffic and Highway Engineering, 4th Edition, 2009.
- [4] Mahmoud Tawifik Salem. (1985) "Transportation and Traffic Engineering".

59. Facilities required for teaching and learning

Lecture/Classroom

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

60. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LOs
1	Introduction: Importance of Transportation, Road Classification.	1	CLO24
2	Driver, Vehicle, and Road Characteristics: The Human Response Process, Braking Distance, Sight Distance.	1	CLO7, CLO22, CLO24
3	Traffic Engineering Studies: Speed studies.	1,3	CLO22, CLO24
4	Traffic Engineering Studies: Continue of speed studies.	1,3	CLO22, CLO24
5	Traffic Engineering Studies: Volume studies	1,3	CLO22, CLO24
6	Traffic Engineering Studies: Continue of volume studies.	1,3	CLO22, CLO24
7	Traffic flow characteristics.	1	CLO22, CLO24
8	Highway capacity.	1	CLO6, CLO7, CLO24
10	Traffic control (P1): intersection control.	1,3	CLO6, CLO7, CLO24
11	Traffic control (P2): traffic signs and road marking.	1,3	CLO6, CLO7, CLO24
12	Parking.	1,3	CLO6, CLO7, CLO24
13	Trip Generation techniques and methods.	1,3	CLO22, CLO24
14	Trip distribution methods.	1,3	CLO22, CLO24

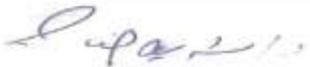
61. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global,	CLO6	Apply engineering design processes for traffic design to produce cost-effective solutions.
		CLO7	Meet specified needs for traffic design with consideration for social, economic,

	cultural, social, economic, environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.		and environmental aspects.
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.	CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of traffic engineering.
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.	CLO24	Achieve an optimum design of traffic engineering.

Title	Name	Signature
Course coordinator	Dr. Mohamed Zakria	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif Khafaga	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4268	Course Title: Railway Engineering (2)

62. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4268			
Year/level	Fourth year / 5 th level			(2 nd Semester)
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	-	4

63. Course Aims	
No.	Aim
AM1	Provide an engineer professional that is proficient in railway engineering.
AM3	Give the students the knowledge about the fundamentals of the railway engineering to plan railway engineering projects using contemporary techniques.

64. Course Learning Outcomes (CLOs)	
CLO6	Apply engineering design processes for railway design to produce cost-effective solutions.
CLO7	Meet specified needs for railway design with consideration for social, economic, and environmental aspects.
CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of railway engineering.
CLO24	Achieve an optimum design of railway engineering.

65. Course Contents	
Week No.	Topics

1	Definitions and switches: Switch, Diamond crossing, Crossover.
2	Definitions and switches: Scissor crossover, Slip, Double junction.
3	Stations and yards: Passengers and goods.
4	Locomotive and stabling yards, Sorting and marshalling yard.
5	Railway cost: Price and subsidy (P1).
6	Railway cost: Price and subsidy (P2).
7	Signals: Classification and types.
8	Means of securing mechanical movement.
9	MidTerm Exam
10	Controlling the movement of trains.
11	Automatic block system (ABS).
12	Centralized traffic control system (C.T.C).
13	Automatic train control (ATC) system.
14	Revision.
15	Final Exam.

66. Teaching and Learning methods												
Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO6	√	√	√	√	-	√	-	-	-	√	√	-
CLO7	√	√	-	√	-	-	-	-	-	√	√	-

	Ministry of Higher Education Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

CLO22	√	-	√	√	-	√	√	-	-	√	√	-
CLO24	-	-	-	√	-	√	√	√	-	√	√	-

67. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

68. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-----
2	Reports	CLO6, CLO7, CLO22, CLO24
3	Sheets	CLO6, CLO7, CLO22, CLO24
4	Quiz 1 / Quiz 2	-----
5	Mid-term Exam	CLO6, CLO7, CLO22, CLO24
6	Oral/ Practical Exam	-----
7	Final Exam	CLO6, CLO7, CLO22, CLO24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights

Teacher Opinion	Reports	40%	40	5%	5
	Sheets			15%	15
	Attendance			-	-
	Quiz 1 / Quiz 2			-	-
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance			-	-
	Lab. Reports			-	-
	Lab. Activities / Projects			-	-
	Final oral / practical exam			-	-
Final Exam	Written exam	60%	60	60%	60
Total		100%	100	100	100

69. List of References

- [1] Egyptian code of practice for airport and highway construction and Bridges, Cairo, 2020.
- [2] Mannering, F.L. and Kilareski, W.P., "Principles of Highway Engineering and Traffic Analysis", John Wiley & Sons, 7th edition, New York, 2020.
- [3] S.C.Saxena, S.P. Arora, "A Textbook of Railway Engineering", Dhanpat Rai Publications, (2005).
- [4] K. Bindra and S. P. Bindra, "Elements of Bridges, Tunnel and Railway Engineering", Dhaupat Rai & Sons, (1989).

70. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

71. Matrix of Course Content with Course LO's

Week	Topics	Aim	LOs
------	--------	-----	-----

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology, Fifth Settlement	
	Civil Engineering Department	

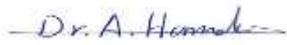
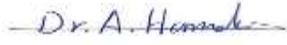
No.			
1	Definitions and switches: Switch, Diamond crossing, Crossover.	1	CLO6, CLO24
2	Definitions and switches: Scissor crossover, Slip, Double junction.	1	CLO6, CLO7, CLO24
3	Stations and yards: Passengers and goods.	1,3	CLO6, CLO24
4	Locomotive and stabling yards, Sorting and marshalling yard.	1,3	CLO7, CLO24
5	Railway cost: Price and subsidy (P1).	1,3	CLO6, CLO7, CLO22, CLO24
6	Railway cost: Price and subsidy (P2).	1,3	CLO6, CLO7, CLO22, CLO24
7	Signals: Classification and types.	1,3	CLO6, CLO24
8	Means of securing mechanical movement.	1	CLO6, CLO7, CLO24
10	Controlling the movement of trains.	1,3	CLO7, CLO24
11	Automatic block system (ABS).	1,3	CLO6, CLO7, CLO22, CLO24
12	Centralized traffic control system (C.T.C).	1,3	CLO6, CLO7, CLO22, CLO24
13	Automatic train control (ATC) system.	1,3	CLO6, CLO7, CLO22, CLO24
14	Revision.		

72. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
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.	CLO6	Apply engineering design processes for railway design to produce cost-effective solutions.
		CLO7	Meet specified needs for railway design with consideration for social, economic, and environmental aspects.
PLO11	Select appropriate and sustainable technologies for construction of buildings. Infrastructures and water	CLO22	Use numerical techniques by applying a full range of civil engineering concepts and techniques of railway engineering.

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	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.		
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.	CLO24	Achieve an optimum design of railway engineering.

Title	Name	Signature
Course coordinator	Asso. Prof. Dr. Ahmed Hamdy	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif Khafaga	
Date of Approval	4/10/2022	

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	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4271	Course Title: Finite Element Method

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4271			
Year/level	fourth year / fifth level (2 nd . Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

2. Course Aims	
No.	Aim
AM2	Teach the students how to analysis of structure (AM2).
AM3	Give the students the knowledge and expertise to analysis of structure using several techniques (AM3).

3. Learning Outcomes (LOs)	
CLO1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics,

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4. Course Contents	
Topics	Week
Introduction into finite element method	1
Introduction into finite element method	2
Assemblage of discrete elements	3
Assemblage of discrete elements	4
Elastic continua	5
Elastic continua	6
Triangular elements for plane stress	7
Rectangular elements for plane stress,	8
Midterm exam	9
Transformation matrix	10
Assembling the structure stiffness matrix	11
Rectangular elements in bending	12
Various elements for two- and three-dimensional analyses	13
Various elements for two- and three-dimensional analyses	14
Final Exam	15

5. Teaching and Learning methods	
Course learning Outcomes (LOs)	Teaching and Learning Methods

	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. Experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO1	√	√		√								
CLO2	√	√		√								
CLO22							√			√	√	

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Sheets	CLO1,CLO2,CLO22
3	Quizzes	CLO1,CLO2,CLO22
4	Mid-term Exam	CLO1,CLO2,CLO22
6	Final Exam	CLO1,CLO2,CLO22

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	Bi-weekly

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	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

4	Mid-term Exam	9
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	10%	10
	Attendance			-	
	Quizzes			10%	10
	Mid-term exam			20%	20
Final Exam		60%	60		
Total		100%	100		

8. List of References

- [1] Bathe, K. J. (2007). Finite element method. Wiley encyclopedia of computer science and engineering, 1-12.
- [2] Reddy, J. N. (2019). Introduction to the finite element method. McGraw-Hill Education.
- [3] Dhatt, G., Lefrançois, E., & Touzot, G. (2012). Finite element method. John Wiley & Sons.
- [4] Zieli, T. G. (1992). Introduction to the finite element method. Poland: Institute of Fundamental Technological Research of the Polish Academy of Sciences.

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

10. Matrix of Course Content with Course LO's

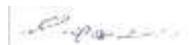
No.	Topics	Aim	Los
1	Introduction into finite element method	AM2, AM3	CLO1,CLO2,CLO22
2	Introduction into finite element method	AM2, AM3	CLO1,CLO2,CLO22
3	Assemblage of discrete elements	AM2, AM3	CLO1,CLO2,CLO22
4	Assemblage of discrete elements	AM2, AM3	CLO1,CLO2,CLO22
5	Elastic continua	AM2, AM3	CLO1,CLO2,CLO22
6	Elastic continua	AM2, AM3	CLO1,CLO2,CLO22
7	Triangular elements for plane stress	AM2, AM3	CLO1,CLO2,CLO22
8	Rectangular elements for plane stress,	AM2, AM3	CLO1,CLO2,CLO22
9	Midterm exam	AM2, AM3	CLO1,CLO2,CLO22
10	Transformation matrix	AM2, AM3	CLO1,CLO2,CLO22
11	Assembling the structure stiffness matrix	AM2, AM3	CLO1,CLO2,CLO22
12	Rectangular elements in bending	AM2, AM3	CLO1,CLO2,CLO22
13	Various elements for two- and three-dimensional analyses	AM2, AM3	CLO1,CLO2,CLO22
14	Various elements for two- and three-dimensional analyses	AM2, AM3	CLO1,CLO2,CLO22
15	Final Exam	AM2, AM3	CLO1,CLO2,CLO22

11. Matrix of Program LOs with Course Los

Program LOs		Course Los	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
		CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
PLO11	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials,	CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics,

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	Civil Engineering Department	

Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.		
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Title	Name	Signature
Course coordinator	Dr. Mamdouh Tawakol	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Shrif Khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification

Course Code: CVE 4272 Course Title: The construction behavior of the steel structures

12. Basic information

Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4272			
Year/level	Fourth year / Fifth level			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2	0	4

13. Course Aims

No.	Aim
AM1	Provide a professional engineer capable of working efficiently and effectively in steel structures area design (AM1).
AM2	Teach the students to practice the methodology in thinking and describing steel structures design problems (AM2).
AM5	Teach the students to practice the methodology in thinking and describing steel structures design problems (AM5).

14. Course Learning Outcomes (LOs)

CLO1	Identify steel types and its properties.
CLO2	Solve complex steel design problems by applying structure analyzing fundamentals and mathematics.
CLO6	Apply engineering design processes to produce cost-effective solutions for steel structures.
CLO17	Use creative, innovative, and flexible thinking to respond to new steel design situations.

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	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

15. Course Contents

Topics	Week
Introduction, Fabrication procedures of steel structures: Flame cutting. [1]	1
Introduction, Fabrication procedures of steel structures: Flame cutting. [2]	2
Shearing and sawing [1]	3
Shearing and sawing [2]	4
Punching, Drilling, Welding techniques and inspection	5
Painting procedure and inspection	6
Maintenance of steel structures	7
Pre-stressed steel structures: Different applications, Theory and design, details.	8
Mid-term exam	9
Ductile behaviour of steel joints: Behaviour of structural steel joints, Pretensioned bolts, Nonpretensioned bolts, Washers, Nuts, Welding, Rigid and semi rigid joints [1]	10
Ductile behaviour of steel joints: Behaviour of structural steel joints, Pretensioned bolts, Nonpretensioned bolts, Washers, Nuts, Welding, Rigid and semi rigid joints [2]	11
Fire resistance in steel structures: Fire resistance of protected and unprotected steel beams and columns, Analysis and design of steel members at elevated temperatures.	12
Fatigue behaviour of steel structures [1]	13
Fatigue behaviour of steel structures [2]	14
Final exam	15

16. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods
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	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO1	√	√		√		√	√					√
CLO2			√		√	√	√				√	√
CLO6	√	√	√	√	√	√	√					√
CLO17	√	√	√	√		√	√				√	√

17. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

18. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Sheets	CLO1, CLO2, CLO6, CLO17
3	Quizzes	CLO1, CLO2, CLO6, CLO17

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	Civil Engineering Department	

4	Mid-term Exam	CLO1, CLO2, CLO6, CLO17
5	Oral/ Practical Exam	-----
6	Final Exam	CLO1, CLO2, CLO6, CLO17

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	-----
4	Mid-term Exam	9
5	Practical Exam	-----
6	Final Exam	16

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	10%	10
	Attendance				
	Quizzes			10%	10
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

19. List of References
[1] Steel Structures design and Behavior G. Salman& E. Johnson, Fifth Edition 2009.
[2] Structural Steel Design, Jack C. McCormack, fourth Edition, 2008.
[3] Egyptian Code of Practice ASD, LRFD, 2010.
[4] (AISC 360-16) ,2019

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

20. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

21. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction, Philosophies of steel structure.	AM1, AM2	CLO1, CLO2, CLO6, CLO17
2	Systems and Uses, Materials, Design in steel structure.	AM1, AM2	CLO1, CLO2, CLO6, CLO17
3	Structural systems and general layout.[1]	AM1, AM2	CLO1, CLO2, CLO6, CLO17
4	Structural systems and general layout.[2]	AM1, AM2	CLO1, CLO2, CLO6, CLO17
5	Loads, Classification of Sections, Slenderness Ratios and Buckling Lengths and Analysis and design concepts, ASD, LRFD design concepts.[1]	AM1, AM2	CLO1, CLO2, CLO6, CLO17
6	Loads, Classification of Sections, Slenderness Ratios and Buckling Lengths and Analysis and design concepts, ASD, LRFD design concepts.[2]	AM1, AM2	CLO1, CLO2, CLO6, CLO17
7	Design of tension members.	AM1, AM2	CLO1, CLO2, CLO6, CLO17
8	Design of axially loaded compression members.	AM1, AM2	CLO1, CLO2, CLO6, CLO17
9	Types of connections in steel structures (simple connection, shear connection, moment connections)	AM1, AM2	CLO1, CLO2, CLO6, CLO17
10	Design of non-pretension, pretention bolted connections (Shear, Tension & Shear + Tension) and details of bolted connections.[1]	AM1, AM2,AM5	CLO1, CLO2, CLO6, CLO17
11	Design of non-pretension, pretention bolted connections (Shear, Tension & Shear + Tension) and details of bolted connections.[2]	AM1, AM2	CLO1, CLO2, CLO6, CLO17

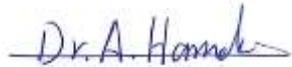
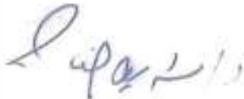
	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	
Title	Name	Signature

12	Design of welded connections and details of welded connections.[1]	AM1, AM2	CLO1, CLO2, CLO6, CLO17
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22. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO1	Identify steel types and its properties.
		CLO2	Solve complex steel design problems by applying structure analyzing fundamentals and mathematics.
PLO3	Apply engineering design processes to produce cost-effective solutions. Meet specified needs with consideration for global, cultural, social, economic, environmental, and ethical aspects. Achieve the principles of design within the principles and contexts of sustainable design and development.	CLO6	Apply engineering design processes to produce cost-effective solutions for steel structures.
PLO9	Use creative, innovative, and flexible thinking to respond to new situations. Acquire entrepreneurial and leadership skills to anticipate new situations.	CLO17	Use creative, innovative, and flexible thinking to respond to new steel design situations.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course coordinator	Dr. Medhat Momtaz	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification

Course Code: CVE4273 Course Title: Geotechnical Analysis Using Computer

23. Basic information

Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4273			
Year/level	Fourth year / Fifth level			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	0	4

24. Course Aims

No.	Aim
1	Provide an engineering professional that is good in numerous facets of design and implementation in the practice of civil engineering structures (AM1)
2	Teach the students to practice the methodology in thinking and describing geotechnical design problems (AM2).

25. Learning Outcomes (LOs)

CLO3	Develop and conduct appropriate experimentation and/or simulation to draw conclusions.
CLO4	analyze and interpret data, assess by using statistical analyses to draw conclusions.
CLO5	evaluate findings and use statistical analyses and objective engineering judgment.
CLO9	Utilize contemporary technologies, codes of practice and standards.
CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Soil Mechanics.
CLO24	Achieve an optimum design of Reinforced Concrete and Steel Structures. Foundations and Earth Retaining Structures.

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	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

26. Course Contents

Topics	Week
Introduction on geotechnical engineering	1
Selection of geotechnical parameters for computer analysis	2
Software applications on Slope stability (1)	3
Software applications on Slope stability (2)	4
Software applications on Seepage analysis(1)	5
Software applications on Seepage analysis(2)	6
Software applications on Settlement of shallow foundations.	7
Software applications on Beams on elastic foundations.	8
Mid term exam	9
Software applications on Piles under lateral loads.(1)	10
Software applications on Piles under lateral loads.(2)	11
Geotechnical applications using Excel program on Bearing capacity of shallow foundations,	12
Geotechnical applications using Excel program on Capacity of axially loaded piles.	13
Final revision	14
Final exam	15

27. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods
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	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO3	√	√		√		√	√					√
CLO4			√		√	√	√				√	√
CLO5	√	√	√	√	√	√	√					√
CLO9	√	√	√	√		√	√				√	√
CLO22			√		√	√	√					√
CLO24								√			√	

28. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

29. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
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	Ministry of Higher Education	
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	Civil Engineering Department	

1	Attendance	-----
2	Sheets	CLO3,CLO4,CLO5, CLO9,CLO22,CLO24
3	Quiz	-
4	Mid-term Exam	CLO3,CLO4, CLO9
5	Practical Exam	CLO9,CLO22
6	Final Exam	CLO3,CLO4,CLO5, CLO9,CLO22,CLO24

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	weekly
3	Quiz	-
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	30%	30	10%	10
	Attendance			10%	10
	Quiz			-	-
	Mid-term exam			10%	10
Practical / Oral	Practical Attendance	10%	10		
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam			10%	10
Final Exam		60%	60		
Total		100%	100		

30. List of References
[1] Potts, D. M., Zdravković, L., Addenbrooke, T. I., Higgins, K. G., & Kovačević, N.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

(2001). Finite element analysis in geotechnical engineering: application (Vol. 2). London: Thomas Telford

[2] Desai, C. S., & Zaman, M. (2013). Advanced geotechnical engineering: Soil-structure interaction using computer and material models. CRC Press.

(3) Phoon, K. K., & Ching, J. (Eds.). (2018). *Risk and reliability in geotechnical engineering*. CRC Press

31. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

32. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction on geotechnical engineering	AM1,AM2	CLO3, CLO4, CLO22
2	Selection of geotechnical parameters for computer analysis	AM2	CLO3, CLO4, CLO22
3	Software applications on Slope stability (1)	AM1,AM2	CLO3, CLO4, CLO5, CLO9
4	Software applications on Slope stability (2)	AM1,AM2	CLO3, CLO4, CLO5, CLO9
5	Software applications on Seepage analysis(1)	AM2	CLO3, CLO4, CLO22
6	Software applications on Seepage analysis(2)	AM2	CLO3, CLO4, CLO22
7	Software applications on Settlement of shallow foundations.	AM2,AM2	CLO3, CLO4, CLO5, CLO9
8	Software applications on Beams on elastic foundations.	AM1,AM2	CLO3, CLO4, CLO24,CLO6
9	Mid term exam	AM1,AM2	
10	Software applications on Piles under lateral loads.(1)	AM1,AM2	CLO3, CLO4, CLO5, CLO6
11	Software applications on Piles under lateral loads.(2)	AM1,AM2	CLO3, CLO4, CLO22,CLO9
12	Geotechnical applications using Excel	AM1,AM2	CLO3, CLO4, CLO5,

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

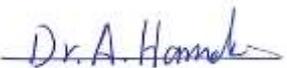
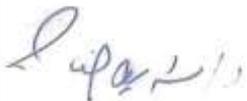
	program on Bearing capacity of shallow foundations,		CLO6
13	Geotechnical applications using Excel program on Capacity of axially loaded piles.	AM1,AM2	CLO3,CLO4, CLO22
14	Final revision	AM1,AM2	CLO9,CLO22
15	Final exam	AM1,AM2	CLO3,CLO4,CLO5, CLO9,CLO22,CLO24

33. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO2	Develop and conduct appropriate experiences, simulation, data analysis, interpret and evaluate results using statistical analyzes and substantive engineering rule to extract results.	CLO3	Develop and conduct appropriate experimentation and/or simulation to draw conclusions.
		CLO4	analyze and interpret data, assess by using statistical analyses to draw conclusions.
		CLO5	evaluate findings and use statistical analyses and objective engineering judgment.
PLO4	Use of modern technologies and professional practice bases, quality standards, health and environmental health and risk issues and risk management principles.	CLO6	Utilize contemporary technologies, codes of practice and standards.
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.	CLO22	Use either numerical techniques or physical measurements 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
PLO12	Achieve an optimum design of Reinforced Concrete and	CLO24	Achieve an optimum design of Reinforced Concrete and Steel Structures.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

<p>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.</p>		<p>Foundations and Earth Retaining Structures.</p>
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Title	Name	Signature
Course coordinator	Dr. Khaled samy	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif khafaga.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4274	Course Title: Methods of concrete structure Construction

34. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4274			
Year/level	Fourth year / fifth level (2 nd Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

35. Course Aims	
No.	Aim
AM2	Teach the students to practice the methodology of characterize the shuttering contents for construct footings, columns, wall, and slabs.
AM4	Strengthening the links between the sectors participating in the process of establishing national civil projects

36. Course Learning Outcomes (LOs)	
CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
CLO24	Achieve an optimum design of Reinforced Concrete Structures.
CLO31	Deal with project insurance and guarantees

37. Course Contents	
Topics	Week
Introduction of Wooden shuttering	1

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	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Foundations wooden shuttering	2
Retuning wall wooden shuttering	3
Retuning wall wooden shuttering	4
Columns wooden shuttering	5
Slabs wooden shuttering	6
Slabs wooden shuttering	7
Stairs wooden shuttering	8
Midterm exam	9
Stairs wooden shuttering	10
Metallic shuttering	11
Metallic shuttering	12
Slip forms shuttering	13
Slip forms shuttering	14
Final Exam	15

38. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO17	√	√		√	√							
CLO24	√	√	√				√	√		√		
CLO31	√	√		√				√		√	√	

39. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

40. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-----
2	Reports	CLO17,24,31

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

3	Sheets	CLO17,24,31
4	Quizzes	CLO17,24
5	Mid-term Exam	CLO17.24.31
6	Final Exam	CLO17.24.31

7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Sheets	Bi-weekly
4	Quizzes	Bi-weekly
5	Mid-term Exam	9
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports	35%	35	5%	5
	sheets			10%	10
	Attendance			-	-
	Quizzes			5%	5
	Mid-term exam			20%	20
Final Exam		60%	60		
Total		100%	100		

41. List of References

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

- [1] Mohamed Khafaga. (2015), Engineering Properties of Materials, Egyptian Dar El-Qotob
- [2] Hibbeler, Russell Charles. Mechanical of materials. 2012.
- [3] Abdel Rahman Megahed, (2001), “Structural Engineer guide book for strengthen of materials and advanced structural analysis” code B-g/66 .
- [4] Goodno, Barry J., and James M. Gere. Mechanics of materials. Cengage Learning, 2020.

42. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

43. Matrix of Course Content with Course LO's

Week	Topics	Aim	LOs
1	Introduction of Wooden shuttering	AM1,AM3	CLO17, CLO24
2	Foundations wooden shuttering	AM1,AM3	CLO17, CLO24
3	Retuning wall wooden shuttering	AM1,AM3	CLO17, CLO24
4	Retuning wall wooden shuttering	AM1,AM3	CLO17, CLO24
5	Columns wooden shuttering	AM1,AM3	CLO17, CLO24
6	Slabs wooden shuttering	AM1,AM3	CLO17, CLO31
7	Slabs wooden shuttering	AM1,AM3	CLO17, CLO31
8	Stairs wooden shuttering	AM1,AM3	CLO17, CLO31
9	Midterm exam	AM1,AM3	CLO17, CLO31
10	Stairs wooden shuttering	AM1,AM3	CLO17,CLO24, CLO31
11	Metallic shuttering	AM1,AM3	CLO17,CLO24, CLO31
12	Metallic shuttering	AM1,AM3	CLO17,CLO24, CLO31
13	Slip forms shuttering	AM1,AM3	CLO17,CLO24, CLO31
14	Slip forms shuttering	AM1,AM3	CLO17, CLO24,CLO31

44. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO17	Use creative, innovative, and flexible thinking to respond to new situations.

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	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

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.	CLO24	Achieve an optimum design of Reinforced Concrete Structures.
PLO15	Deal with bidding, contract and financial issues including project insurance and guarantees.	CLO31	Deal with project insurance and guarantees

Title	Name	Signature
Course coordinator	Asso. Prof. Sherif Khafaga	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Sherif Khafaga	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4275	Course Title: Road construction technology

45. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4275			
Year/level	Fourth year / Fifth level (2 st Semester)			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1		3

46. Course Aims	
No.	Aim
1	Provide an engineer professional that is proficient in highway engineering (AM1).
2	Teach the students to practice the principles of geometric and structural design (AM2).
3	Make it possible for graduates to pursue continuing education in highway engineering and self-learning. (AM5)

47. Course Learning Outcomes	
CLO6	Apply engineering design processes for highway design to produce cost-effective solutions.
CLO7	Meet specified needs for highway design with consideration for social, economic, and environmental aspects.
CLO12	Practice research techniques and methods of highway engineering problems investigation.
CLO24	Achieve an optimum geometric and structural design of highway.

48. Course Contents

No.	Topics	Week
1	Introduction: Highways Construction Technology	1
2	Technology of embankment construction, Technology of pavement construction	2
3	Introduction on Lay down of asphalt mixes	3
4	Lay down of asphalt mixes: Compaction of asphalt mixes	4
5	Operation and supervision of asphalt mixing plants	5
6	Equipment, Inspection, Quality control, Surface treated pavements	6
7	Midterm exam	7
8	Methods of soil stabilization	8
9	Rigid pavements: Technology of construction, Quality control	9
10	Construction requirements for modified binders: Polymers, Sulphur, Mineral filler and other additives	10
11	Use of asphalt in hydraulic structures: Reservoirs	11
12	Use of asphalt in hydraulic structures: Tanks design, Dams	12
13	Use of asphalt in hydraulic structures: Canal lining, Embankment protection, Coastal structures	13
14	Revision	14

49. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

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	Civil Engineering Department	

CLO6	√	√	√	√		√				√	√
CLO7	√	√		√						√	√
CLO12							√			√	√
CLO24				√		√	√	√		√	√

50. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

51. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-----
2	Reports / Sheets	CLO6, CLO7, CLO12, CLO24
3	Quiz 1 / Quiz 2	
4	Mid-term Exam	CLO6, CLO7, CLO24
5	Oral/ Practical Exam	
6	Final Exam	CLO6, CLO7, CLO24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	-
4	Mid-term Exam	9
5	Oral/ Practical Exam	-
6	Final Exam	16

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	20%	20
	Attendance			-	
	Quiz 1 / Quiz 2				
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

52. List of References

- [1] Egyptian code of practice for airport and highway construction and Bridges, Cairo, 2020.
- [2] Mannering, F.L. and Kilareski, W.P., "Principles of Highway Engineering and Traffic Analysis", John Wiley & Sons, 7th edition, New York, 2020.
- [3] AASHTO-GreenBook-7th-edition (2018).
- [4] Garber N. J. and Hoel, L. A., "Traffic and Highway Engineering", 4th Edition, 2009.
- [5] "The handbook of highway engineering" T. F. Fwa, 2006.

53. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

	Ministry of Higher Education	
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	Civil Engineering Department	

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Laboratory Usage

54. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction: Highways Construction Technology	1	CLO6, CLO7, CLO12,
2	Technology of embankment construction, Technology of pavement construction	1	CLO6, CLO7
3	Introduction on Lay down of asphalt mixes	1	CLO6, CLO7
4	Lay down of asphalt mixes: Compaction of asphalt mixes	1,5	CLO6, CLO7, CLO12,
5	Operation and supervision of asphalt mixing plants	1,2,5	CLO6, CLO24,
6	Equipment, Inspection, Quality control, Surface treated pavements	1,2,5	CLO6, CLO7, CLO24,
8	Methods of soil stabilization	1,2,5	CLO6, CLO7, CLO24,
9	Rigid pavements: Technology of construction, Quality control	1,5	CLO6, CLO7, CLO24,
10	Construction requirements for modified binders: Polymers, Sulphur, Mineral filler and other additives	1,2,5	CLO6, CLO7, CLO24,
11	Use of asphalt in hydraulic structures: Reservoirs	1,5	CLO6, CLO24
12	Use of asphalt in hydraulic structures: Tanks design, Dams	1,5	CLO6, CLO24
13	Use of asphalt in hydraulic structures: Canal lining, Embankment protection, Coastal structures	1,2,5	CLO6, CLO24
14	Revision	1,2,5	CLO6, CLO7, CLO24,

55. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic,	CLO6	Apply engineering design processes for highway design to produce cost-effective solutions.
		CLO7	Meet specified needs for highway design with consideration for social, economic, and environmental aspects.

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	Civil Engineering Department	

	environmental, ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.		
PLO5	Practice research techniques and methods of investigation as an inherent part of learning	CLO12	Practice research techniques and methods of highway engineering problems investigation.
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.	CLO24	Achieve an optimum geometric and structural design of highway.

Title	Name	Signature
Course coordinator	Dr. Mohamed Zakria	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Asso. Prof. Dr. Ahmed Hamdy	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE 4276	Course Title: airport engineering

56. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4276			
Year/level	Fourth year / 5 th level (2 nd Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	-	4

57. Course Aims	
No.	Aim
AM4	Strength the links between the sectors participating in the process of establishing national civil projects.
AM7	Work with contemporary field instrumentation, design and perform experiments, and analyze and interpret the results.

58. Course Learning Outcomes (CLOs)	
CLO6	Apply transportation planning processes to produce cost-effective solutions.
CLO7	Meet specified needs for transportation planning with consideration for social, economic, and environmental aspects.
CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Surveying..
CLO24	Achieve an optimum planning of transportation networks.

59. Course Contents

Topics	Week
Introduction of Airports	1
Planning and Design of Airports	2
Planning and Design of Airports part2	3
Airport Components and Terminal Configurations	4
Airport Components and Terminal Configurations part 2	5
Landing and take-off design of aircraft	6
Landing and take-off design of aircraft part 2	7
Airplane Parking Lot	8
midterm	9
Airplane Parking Lot part 2	10
Describe various aircraft characteristics	11
Describe various aircraft characteristics part 2	12
Structural design of airports	13
Practical exam	14
Final exam	15

60. Teaching and Learning methods

Course learning Outcomes (CLOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO6	√	√	√	√		√				√	√	

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CLO7	√	√		√					√	√	
CLO22	√		√	√		√	√		√	√	
CLO24				√		√	√	√	√	√	

61. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

62. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	CLOs
1	Attendance	-----
2	Sheets	CLO6, CLO7, CLO22, CLO24
3	Quiz 1 / Quiz 2	CLO6, CLO7, CLO22, CLO24
4	Mid-term Exam	CLO6, CLO7, CLO22, CLO24
5	Practical Exam	-----
6	Final Exam	CLO6, CLO7, CLO22, CLO24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	20%	20
	Attendance			-	-
	Quiz 1 / Quiz 2			-	-
	Mid-term exam			20%	20
Practical	Practical Attendance			-	-
	Lab. Reports			-	-
	Lab. Activities / Projects			-	-
	practical exam			-	-
Final Exam		60%	60	60%	60
Total		100%	100	100%	100

63. List of References

- [1] Egyptian code of practice for airport and highway construction and Bridges, Cairo, 2020.
- [2] Mannering, F.L. and Kilareski, W.P., "Principles of Highway Engineering and Traffic Analysis", John Wiley & Sons, 7th edition, New York, 2020.
- [3] Garber N. J. and Hoel, L. A., Traffic and Highway Engineering, 4th Edition, 2009.
- [4] Mahmoud Tawifik Salem. (1985) "Transportation and Traffic Engineering".

64. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Laboratory Usage

65. Matrix of Course Content with Course LO's

No.	Topics	Aim	CLOs
1	Introduction of Airports	AM4	CLO6, CLO24
2	Planning and Design of Airports	AM4	CLO6, CLO7, CLO22, CLO24
3	Planning and Design of Airports part2	AM4,AM7	CLO6, CLO7, CLO22, CLO24
4	Airport Components and Terminal Configurations	AM4,AM7	CLO6, CLO7, CLO22, CLO24
5	Airport Components and Terminal Configurations part 2	AM4,AM7	CLO22, CLO24
6	Landing and take-off design of aircraft	AM4,AM7	CLO22, CLO24
7	Landing and take-off design of aircraft part 2	AM4,AM7	CLO22, CLO24
8	Airplane Parking Lot	AM4,AM7	CLO22, CLO24
9	Airplane Parking Lot part 2	AM7	CLO7, CLO22, CLO24
10	Describe various aircraft characteristics	AM7	CLO7, CLO22, CLO24
11	Describe various aircraft characteristics part 2	AM7	CLO7, CLO22, CLO24
12	Structural design of airports	AM7	CLO22, CLO24

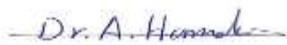
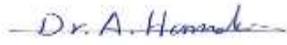
	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

66. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
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.	CLO6	Apply transportation planning processes to produce cost-effective solutions.
		CLO7	Meet specified needs for transportation planning with consideration for social, economic, and environmental aspects.
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.	CLO22	Use either numerical techniques or physical measurements by applying a full range of civil engineering concepts and techniques of: Surveying.
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,	CLO24	Achieve an optimum planning of transportation networks.

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

	Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.		
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Title	Name	Signature
Course coordinator	Asso. Prof. Dr. Ahmed Hamdy	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Mohmed Elsayed Abou-Hashem.	
Date of Approval	4/10/2022	

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Course Specification	
Course Code: CVE <u>4277</u>	Course Title: Road and airport maintenance

67. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE <u>4277</u>			
Year/level	Fourth year / Fifth level (2 nd Semester)			
Specialization	Major			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	---	4

68. Course Aims	
No.	Aim
AM1	Provide an engineer professional that is proficient in highway engineering (AM1).
AM5	Make it possible for graduates to pursue continuing education in highway engineering and self-learning. (AM5)

69. Learning Outcomes (LOs)	
CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.by applying engineering fundamentals, basic science, and mathematics.
CLO6	Apply engineering design processes for highway design to produce cost-effective solutions.
CLO7	Meet specified needs for highway design with consideration for social, economic, and environmental aspects.
CLO12	Practice research techniques and methods of highway engineering problems investigation.

70. Course Contents

Topics	Week
Introduction.	1
Assessment of flexible pavement distresses.	2
Assessment of rigid pavement distresses.	3
Tests of pavement evaluation, Methods of pavement evaluation.	4
Maintenance of flexible pavement, Maintenance of rigid pavement.	5
Maintenance of pedestrian crossing routes, Road curbs and pitching.	6
Maintenance of unpaved roads.	7
Maintenance of drainage system.	8
Maintenance of opened and covered ditches.	10
Maintenance of surface water drainage system.	11
Recycling of road pavement materials.	12
Reconstruction works.	13
Pavement management systems.	14
Final exam	15

71. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods										
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

CLO2	√	√	√	√		√				√	√	
CLO6	√	√		√						√	√	
CLO7							√			√	√	
CLO12				√		√	√	√		√	√	

72. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

73. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Sheets	CLO2,6,7
3	Quizzes	-----
4	Mid-term Exam	CLO6,7
5	Practical Exam	-----
6	Final Exam	CLO2,6, 7, 12

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	-
4	Mid-term Exam	9
5	Practical Exam	14
6	Final Exam	15

7.3 Weighting of Assessments					
	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports / sheets / Activities	40%	40	20%	20
	Attendance			-	
	Quiz 1 / Quiz 2				
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

74. List of References

- [1] Egyptian code of practice for airport and highway construction and Bridges, Cairo, 2020.
- [2] Mannering, F.L. and Kilareski, W.P., "Principles of Highway Engineering and Traffic Analysis", John Wiley & Sons, 7th edition, New York, 2020.
- [3] AASHTO-GreenBook-7th-edition (2018).
- [4] Garber N. J. and Hoel, L. A., "Traffic and Highway Engineering", 4th Edition, 2009.
- [5] "The handbook of highway engineering" T. F. Fwa, 2006.

75. Facilities required for teaching and learning

Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show

	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
	Civil Engineering Department	

Laboratory Usage

76. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Introduction.	AM1
2	Assessment of flexible pavement distresses.	AM1	CIO2,7
3	Assessment of rigid pavement distresses.	AM1	CIO2,7
4	Tests of pavement evaluation, Methods of pavement evaluation.	AM1, AM5	CIO6,7,12
5	Maintenance of flexible pavement, Maintenance of rigid pavement.	AM1, AM5	CIO6
6	Maintenance of pedestrian crossing routes, Road curbs and pitching.	AM1, AM5	CIO2,6,7
8	Maintenance of unpaved roads.	AM1, AM5	CIO2,6,7
9	Mid-term exam	AM1, AM5	CIO2,6,12
10	Maintenance of opened and covered ditches.	AM1, AM5	CIO2,6,7
11	Maintenance of surface water drainage system.	AM1, AM5	CIO2,6
12	Recycling of road pavement materials.	AM5	CIO2
13	Reconstruction works.	AM5	CIO2
14	Pavement management systems.	AM5	CIO2
15	Final exam	AM1, AM5	CIO2,6,7,12

77. Matrix of Program LOs with Course Los

Program Los	Course Los
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	Ministry of Higher Education	
	Higher Institute of Engineering and Technology- 5th settlement	
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PLO1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
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.	CLO6	Apply engineering design processes for highway design to produce cost-effective solutions.
		CLO7	Meet specified needs for highway design with consideration for social, economic, and environmental aspects.
PLO3	Practice research techniques and methods of investigation as an inherent part of learning	CLO12	Practice research techniques and methods of highway engineering problems investigation.

Title	Name	Signature
Course coordinator	Dr. Mohamed Zakria	
Program Coordinator:	Asso. Prof. Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif Khafaga	
Date of Approval	4/10/2022	

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Course Specification	
Course Code: CVE 4299	Course Title: Graduation Project (2)

1. Basic information				
Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Civil Engineering Department			
Course Code	CVE 4299			
Year/level	Fourth year / Fifth level			
Specialization	Elective			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	5		7

2. Course Aims	
No.	Aim
AM3	Providing students with academic and technical skills to design and implement civil engineering projects by utilizing modern technologies through proper planning and participatory work (AM3)
AM4	Strengthening the links between the sectors participating in the process of establishing national civil projects and the graduates of the program in the field of practical training and entrepreneurship and qualifying the graduates to compete for leadership positions in their profession (AM4)
AM5	Make it possible for graduates to pursue continuing education and self-learning, and to qualify for advanced scientific degrees (AM5)
AM7	Work with contemporary field instrumentation, design and perform experiments, and analyze and interpret the results (AM7)

3. Course Learning Outcomes (LOs)	
CLO6	Design preferred alternative based on calculations and/or experimental tools using modern engineering tools.
CLO12	Evaluate the impact of the selected design on public health,

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	safety, welfare and global, cultural, social, economic and environmental factors.
CLO14	Work effectively as a member of the project team providing conducive environment and good leadership
CLO16	Acquire and apply new knowledge, beyond taught courses, using appropriate learning strategies includes updates Codes, Softwares, webinars etc to complete the project
CLO20	Prepare professional technical report including necessary design reports and drawings as well as making an oral

4. Course Contents	
Topics	Week.No
The analysis and design of a complete engineering system using the fundamentals, Principles and skills he gained during his study [1]	1
The analysis and design of a complete engineering system using the fundamentals, Principles and skills he gained during his study [2]	2
The analysis and design of a complete engineering system using the fundamentals, Principles and skills he gained during his study [3]	3
The analysis and design of a complete engineering system using the fundamentals, Principles and skills he gained during his study [4]	4
Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper project timing and budgeting [1]	5
Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper project timing and budgeting [2]	6
Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper project timing and budgeting [3]	7
Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper project timing and budgeting [4]	8
Mid-term exam	9
Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper project timing and budgeting [5]	10
Prepare technical report and present the results orally to the audience [1]	11

Prepare technical report and present the results orally to the audience [2]	12
Prepare technical report and present the results orally to the audience [3]	13
Prepare technical report and present the results orally to the audience [4]	-----
Final exam	15

5. Teaching and Learning methods												
Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO6	√		√			√				√		
CLO12		√							√	√	√	
CLO14									√	√	√	
CLO16									√		√	
CLO20	√	√	√			√						

6. Teaching and Learning methods of Disabled Students		
No.	Teaching Method	Reason
1	Additional Tutorials	
2	Online lectures and assignments	

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7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	-----
2	Reports	CLO6
3	Quizzes	CLO6
4	Mid-term Exam	CLO6
5	Practical Exam	-----
6	Final Exam	-----

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Quizzes	-
4	Mid-term Exam	9
5	Practical Exam	-----
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports	40%	40	20%	20
	Attendance			-	
	Quizzes				
	Mid-term exam			20%	20
Practical / Oral	Practical Attendance				
	Lab. Reports				
	Lab. Activities / Projects				
	Final oral / practical exam				
Final Exam		60%	60		
Total		100%	100		

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8. List of References

[1] Codes, Text Books, Published Research Papers and Design Manuals relevant to the assigned Project Topic.

9. Facilities required for teaching and learning

Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

Moodle and Microsoft teams

Data show

Laboratory Usage

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	The analysis and design of a complete engineering system using the fundamentals, Principles and skills he gained during his study [1]	AM5, AM7	CLO6, CLO12
2	The analysis and design of a complete engineering system using the fundamentals, Principles and skills he gained during his study [2]	AM5, AM7	CLO6, CLO12
3	The analysis and design of a complete engineering system using the fundamentals, Principles and skills he gained during his study [3]	AM5, AM7	CLO6, CLO12
4	The analysis and design of a complete engineering system using the fundamentals, Principles and skills he gained during his study [4]	AM5, AM7	CLO6, CLO14
5	Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper	AM5, AM7	CLO6, CLO12

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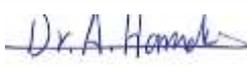
	project timing and budgeting [1]		
6	Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper project timing and budgeting [2]	AM5, AM7	CLO6, CLO16
7	Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper project timing and budgeting [3]	AM5, AM7	CLO6, CLO16
8	Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper project timing and budgeting [4]	AM5, AM7	CLO6, CLO12
9	Establish goals and plan tasks to accomplish objectives for the project using planning techniques to ensure proper project timing and budgeting [5]	AM5, AM7, AM4	CLO6
10	Prepare technical report and present the results orally to the audience [1]	AM5, AM7, AM3	CLO6, CLO16
11	Prepare technical report and present the results orally to the audience [2]	AM5, AM7	CLO6
12	Prepare technical report and present the results orally to the audience [3]	AM5, AM7	CLO6, CLO20

11. Matrix of Program LOs with Course Los

Program Los		Course Los	
PLO3	Apply engineering design processes that meets specified needs.	CLO6	Apply engineering design process in water sedimentation & filtration units, sewage treatment units and sewerage system.
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO12	Practice research techniques and methods of surface and groundwater problems investigation
PLO6	Use creative, innovative, and	CLO14	Supervise and monitor implementation of

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	flexible thinking to respond to new situations.		engineering projects
PLO8	Communicate effectively - graphically, verbally and in writing with a range of audiences using contemporary tools.	CLO16	Communicate effectively in writing of technical report with a range of audiences using contemporary tools.
PLO10	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	CLO20	Practice self, lifelong and other learning strategies.

Title	Name	Signature
Course coordinator		
Program Coordinator:	Asso. Dr. Ahmed Hamdy.	
Head of Department		
Date of Approval	4/10/2022	



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Course Specification

Course Code: HUM 4207

Course Title: Environmental impacts of the projects

1. Basic information

Program Title	Civil Engineering Department			
Department offering the program	Civil Engineering Department			
Department offering the course	Engineering Mathematics and Physics department			
Course Code	HUM 4207			
Prerequisites	None			
Year/level	forth year / second Semester (5 th Level)			
Specialization	Minor			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1	0	3

2. Course Aims

No.	Aim
1	Adapt successfully to apply and develop Environmental Impact Assessment for Engineering Program.(AM6)

3. Learning Outcomes (LOs)

CLO7	Utilize multiple environmental factors, and environmental impacts related to economic dimensions, and avoiding risks of air pollution, water pollution, chemical pollution, electromagnetic pollution
CLO14	Use creative different types of thinking to give innovative improvements to daily problems.



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4-Course contents	
Topics	Week
Introduction to environmental science and occupational safety.	1
Elements of environmental systems Elements of environmental systems	2
Air pollutions	3
Chemical Pollution	4
Water Pollution	5
Pollution caused by acid rain and acid fog	6
Oil Pollution	7
Biological weapons and mechanical methods to remove oil spills	8
Occupational safety and health against the regulation, inspection, and surveillance of workplaces and workers and uses scientific information to prevent injuries and illnesses in workplace settings	10
Human health related to the different types of pollution, and methods of prevention.	11
Definition of the phenomenon of warming, and greenhouses, and predict future hazards.	12
The impact of climate change on the population, agriculture, industry, and economy	13
Apply the Environmental Impact Assessment including all standard codes.	14
Assessing the environmental impact and occupational safety of industrial applications.	15



5. Teaching and Learning methods

Course learning Outcomes (LOs)	Teaching and Learning Methods											
	Lectures (face to face / online)	Presentation / Movies	Discussions	Tutorials	Practical and lab. experiments	Problem Solving	Brain Storming	Projects and Team Working	Site Visits	Research / Reports	Self-learning	Modeling and Simulation
CLO7	√			√			√			√		
CLO14	√		√	√			√			√		

6. Teaching and Learning methods of Disabled Students

No.	Teaching Method	Reason
1	Additional Tutorials	×
2	Online lectures and assignments	×

7. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	Los
1	Attendance	CLO14
2	Reports	CLO7,CLO14
3	Quizzes	CLO7,CLO14
4	Mid-term Exam	CLO7,CLO14

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5	Final Exam	CLO7,CLO14
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7.2 Assessment Schedule		
No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Quizzes	Bi-weekly
4	Mid-term Exam	9
5	Final Exam	16

7.3 Weighting of Assessments			
	Assessment Method	Weights%	Weights
Teacher Opinion	Reports	5%	5
	Attendance	10%	10
	Quizzes	5%	5
	Mid-term exam	20%	20
Final Exam		60%	60
Total		100%	100

8. List of References
<p>1) Laurie Ann Mazur, A Pivotal Moment: Population, Justice, and the Environmental Challenge, scientific and medical journals.2009</p> <p>2) Steven W. Mosher, Population Control: Real Costs, Illusory Benefits, Transaction Publishers (US), 2008</p> <p>3) Lori M. Hunter, The Environmental Implications of Population Dynamics, RAND, 2012</p> <p>4) الانسان وتلوث البيئة – محمد السيد أرناؤوط – الهيئة المصرية العامة للكتاب (2002)</p> <p>5) التلوث الكهرومغناطيسي – د.عبد المقصود حجو – الهيئة المصرية العامة للكتاب (2005)</p>

9. Facilities required for teaching and learning



Lecture/Classroom

White board

Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)

10. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LO's
1	Introduction to environmental science and occupational safety.	1	CLO7
2	Elements of environmental systems Elements of environmental systems	1	CLO7
3	Air pollutions	1	CLO7
4	Chemical Pollution	1	CLO7
5	Water Pollution	1	CLO7
6	Pollution caused by acid rain and acid fog	1	CLO7,CLO14
7	Oil Pollution	1	CLO7,CLO14
8	Biological weapons and mechanical methods to remove oil spills	1	CLO7,CLO14
10	Occupational safety and health against the regulation, inspection, and surveillance of workplaces and workers and uses scientific information to prevent injuries and illnesses in workplace settings	1	CLO7,CLO14
11	Human health related to the different types of pollution, and methods of prevention.	1	CLO7,CLO14
12	Definition of the phenomenon of warming, and greenhouses, and predict future hazards.	1	CLO7,CLO14
13	The impact of climate change on the population, agriculture, industry, and economy	1	CLO7,CLO14
14	Apply the Environmental Impact Assessment including all standard codes.	1	CLO7,CLO14
15	Assessing the environmental impact and occupational safety of industrial applications.	1	CLO7,CLO14

11. Matrix of Program LOs with Course LOs

Program LOs	Course LOs
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PL4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO7	Apply multiple environmental factors, and environmental impacts related to economic dimensions, and avoiding risks of air pollution, water pollution, chemical pollution, electromagnetic pollution
PL9	Use creative, innovative and flexible thinking to acquire leadership skills and respond to new situations.	CLO14	Use creative different types of thinking to give innovative improvements to daily problems.

Title	Name	Signature
Course coordinator	Dr. Ahmed Abd Elbary	
Program Coordinator:	Dr. Ahmed Hamdy	
Head of Department	Prof. Dr. Sherif khafaga.	
Date of Approval	1/10/2022	