	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 R.C structures (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
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	Modeling and Simulation
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.

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,	AM5	CLO17

	analysis of internal forces		
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
15	Final exam	AM2,AM5	CLO8 ,CLO24,CLO17,CLO6

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:	**Dr. Khaled samy abdallah**	
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	
Date of Approval	**/05/2024**	

	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)**

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 **4165**			
Year/level	Fourth year / First Semester (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

2. 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).

3. 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.

4. Course Contents

Topics	Week
Introduction.	1
Sewerage system.	2
Water treatment.	3

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

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	√		√	√		√						
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, 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		

8. 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.**

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 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

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.
PLO12	Achieve an optimum design in Sanaitary 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:	**Dr. khaled Samy Abdallah**	Dr. Khaled Samy
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**09/2023**	

	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

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 4274			
Year/level	Fourth year / fifth level (2nd Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

2. 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 establishingnational civil projects

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 Structures.
CLO31	Deal with project insurance and guarantees

4. Course Contents

Topics	Week
Introduction of Wooden shuttering	1
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

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	√	√		√				√		√	√	

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	CLOs
1	Attendance	-------
2	Reports	CLO17,24,31
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		

8. List of References

[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.

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

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

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	CLO17	Use creative, innovative, and flexible thinking to respond to new situations.

	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 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	**DR. Mamdouh Mostafa Tawakol**	M. Tawakol
Program Coordinator:	**Dr. khaled Samy Abdallah**	Dr. Khaled Samy
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**9/2022**	

	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 (1st 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

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	√			√			√					

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				

	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

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
Course coordinator	**Dr. khaled Samy Abdallah**	Dr. Khaled Samy
Program Coordinator:	**Dr. khaled Samy Abdallah**	Dr. Khaled Samy
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**09/2023**	

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

Course Specification

Course Code: HUM4242 **Course Title: Environmental impact assessment**

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 4242			
Year/level	fourth year / fifth Level (2nd Semester)			
Specialization	**Minor**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	1		3

2. Course Aims

No.	Aim
AM4	Strength 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.
AM6	Use their understanding of professional, ethical, and social responsibilities and the importance of life-long learning in the conduct of their careers.

3. Learning Outcomes (LOs)

CLO7	Meet specified needs with consideration for global, cultural, social, economic, environmental, and ethical aspects.
CLO17	Use creative, innovative, and flexible thinking to respond to new situations.
CLO18	Utilize health and safety for potable water.

4. Course Contents

Topics	Week
Introduction	1
Introduction of environment and environmental impact for projects	2
Human impacts of projects	3
Economic impacts of projects	4
Social and cultural impacts of projects	5
Health and psychological factors of projects	6
Types of projects according to enviromental impact assesment	8
The positive impact of projects on the enviroment	9
The negative impact of projects on the enviroment	10
Direct and indirect impact of projects	11
Permissible rates for project compatibity with the enviroment	12
Evaluating different experiences locally and globally to avoid negative impacts of projects on the environment	13
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

CLO7	√		√	√		√						
CLO17	√		√	√		√				√	√	
CLO18	√		√			√					√	

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	**Assessment Method**	-------
2	Attendance	CLO7,17,18
3	Sheets	…….
4	Research and presentation	CLO17,18
6	Mid-term Exam	CLO7,17,18

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	……
3	Research and presentation	13
4	Mid-term Exam	7
5	Practical Exam	-
6	Final Exam	15

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	sheets	40%	40	-	-
	Attendance			10%	10
	Research and presentation			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		

8. List of References

[1]دليل أسس وإجراءات تقييم التأثيرالبيئي، وزارة الدولة لشئون البيئة، الإصدار الثاني، يناير 2009، جمهورية مصر العربية

[2]اللائحة التنفيذية لقانون البيئة الصادر بقانون رقم 4 الصادر بتاريخ 1994

[3] **Al-Sabbagh, N., "Utilization of recycled aggregates in concrete mixes", Ms.C.ProjectReport, Department of Civil Engineering, Kuwait University, Kuwait, 2002**

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	AM4,6	CLO7,17,18
2	Introduction of environment and environmental impact for projects	AM4,6	CLO7,17
3	Human impacts of projects	AM6	CLO17
4	Economic impacts of projects	AM6	CLO18
5	Social and cultural impacts of projects	AM4,6	CLO7,17,18
6	Health and psychological factors of projects	AM6	CLO17,18
7	Mid term exam	AM4, AM6	CLO7,17,18
8	Types of projects according to enviromental impact assesment	AM4, AM6	CLO7,17,18
9	The positive impact of projects on the enviroment	AM4,6	CLO7,17,18
10	The negative impact of projects on the enviroment	AM6	CLO18
11	Direct and indirect impact of projects	AM4,6	CLO7,17
12	Permissible rates for project compatibity with the enviroment	AM6	CLO17
13	Evaluating different experiences locally and globally to avoid negative impacts of projects on the environment	AM6	CLO17,18
14	Revision	AM4,6	CLO7,17,18
15	Final exam	AM4, AM6	CLO7,17,18

11. 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	CLO7	Meet specified needs with consideration for global, cultural, social, economic, environmental, and ethical aspects.

	accordance with 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.
		CLO18	Acquire entrepreneurial and leadership skills to anticipate new situations.

Title	Name	Signature
Course coordinator	**Dr. Medhat Mahmoud momtaz**	
Program Coordinator:	**Dr. Khaled samy abdallah**	Dr. Khaled Samy
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**/02/2024**	

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

Course Specification

Course Code: HUM 4141 **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 4141**			
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.

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	Modeling and Simulation

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

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

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.

Title	Name	Signature
Course coordinator	**Dr. Medhat Mahmoud Momtaz**	
Program Coordinator:	**Dr. khaled Samy Abdallah**	Dr. Khaled Samy
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**09/2023**	

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

Course Specification

Course Code: HUM 3241 **Course Title: Feasibility Study and Project Management**

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 3241			
Year/level	Fifth Level / second Semester (2nd Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2		4

2. 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).
AM3	Give the students the knowledge and the expertise to plan and carry out civil engineering projects using contemporary techniques (AM3).

3. 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.

4. Course Contents	
Topics	**Week**
Project Management Definitions & Phases for Construction Project	1
Feasibility Studies using SWOT analysis & Cash Flow Method	2
Construction Contracts according to bidding strategy, Cost, Price, Scope	3
Target Cost Contracts	4
Bidding and Tendering referred to the Low regulating tenders by Law no.182 of 2018	5
Planning and Scheduling using deterministic methods	6
Modeling project duration using Critical Path Method – Activity on Node	7
Modeling project duration using Critical Path Method – Activity on Arrow	8
Mid-term exam	9
Modeling project duration using Gannt Chart	10
Resource management using Resource allocation	11
Cost Planning and Cost Estimation for construction projects	12
Estimating Cash flow diagram for contractor	13
Project Quality Management	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
CLO10	√	√		√								
CLO11	√	√		√		√						
CLO13	√	√		√			√					
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	-------
2	Reports / Sheets	CLO10, 11, 13,14
3	Quiz 1 / Quiz 2	CLO 11, CLO 13
4	Mid-term Exam	CLO10, 11
5	Oral/ Practical Exam	----------
6	Final Exam	CLO 10, 11, 13, 14

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quiz 1 / Quiz 2	4 & 10
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	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		

8. 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] Krishnamurthy & Ravindra, (2017), Construction and Project Management, Second edition (PB 2017).

[4] Gould, Frederick E., and Nancy Nancy Eleanor Joyce, (2003), Construction Project Management, publisher: Pearson Prentice Hall, Third edition. https://lccn.loc.gov/2008007792/

[5] Nunnally and Stephens, (2007). Construction Methods and Management, publisher: Prentice Hall, eighth edition. https://lccn.loc.gov/00039179/

[6] Keith Potts and Ankrah Nii (2014). Construction cost management: learning from case studies. Routledge, 2014.

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	Project Management Definitions & Phases for Construction Project	AM3	CLO 10, A6.2
2	Feasibility Studies using SWOT analysis & Cash Flow Method	AM2, AM3	CLO 11, CLO 61
3	Construction Contracts according to bidding strategy, Cost, Price, Scope	AM3	CLO10, CLO41
4	Target Cost Contracts	AM2, AM3	CLO10
5	Bidding and Tendering referred to the Low regulating tenders by Law no.182 of 2018	AM3	CLO 10
6	Planning and Scheduling using deterministic methods	AM2, AM3	CLO 11
7	Modeling project duration using Critical Path Method – Activity on Node	AM2, AM3	CLO 11
8	Modeling project duration using Critical Path Method – Activity on Arrow	AM2, AM3	CLO 11
9	**Mid-term exam**	AM2, AM3	CLO 11
10	Modeling project duration using Gannt Chart	AM2, AM3	CLO 11
11	Resource management using Resource allocation	AM2, AM3	CLO 11, CLO 13, CLO 14
12	Cost Planning and Cost Estimation for construction projects	AM2, AM3	CLO 11, CLO 13, CLO 14
13	Estimating Cash flow diagram for contractor	AM2, AM3	CLO 10, CLO 411
14	Project Quality Management	AM2, AM3	CLO 10, CLO 411
15	**Final exam**	AM2, AM3	CLO 10, CLO 11, CLO 13, CLO 14

11. 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.

Title	Name	Signature
Course coordinator	**Dr. Ghada Taha**	Dr. Ghada Taha
Program Coordinator:	**Dr. Khaled Samy**	Dr. Khaled Samy
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**09/2023**	

	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 (1st 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.

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	Modeling and Simulation

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				

	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

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	
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.

Title	Name	Signature
Course coordinator	**Dr. Medhat Mahmoud Momtaz**	
Program Coordinator:	**Dr. khaled Samy Abdallah**	Dr. Khaled Samy
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**09/2023**	

	Ministry of Higher Education **Higher Institute of Engineering and Technology-fifth settlement** **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

Examples of bases.	4
Studying all kinds of cold formed sections.	5
Determine the effective parts for cold formed section.	6
Midterm week	7
Design of roof purlin using cold formed section and tie rod (two line of tie rod).	8
Eid El Fater	9
Studying the composite section and its properties.1	10
Studying the composite section and its properties.2	11
Design of composite beam with temporary shoring.	12
Design of composite beam without temporary shoring.	13
Final Exam	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
CLO17	√	√	√	√		√	√				√	√
CLO24			√		√	√	√					√
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	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	7
5	Final Exam	14

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				

	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

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.khaled samy**	Dr. Khaled Samy
Head of Department	**Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**10/2023**	

Course Specification

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

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 4174			
Year/level	Fourth year / 5th level (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1	-	4

2. 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.

3. 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.

4. Course Contents

Week No.	Topics
1	Introduction into problematic soil.
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.**

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	√	-	-	√	√	-	-	-	-	-	-	-
CLO9	√	√	√	√	√	√	√	-	-	√	-	-
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	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
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

8. List of References

[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.

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

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, collapsibility potential	2,3	CLO3, CLO9, CLO22
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

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	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.
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 physical measurements by applying a full range of civil engineering concepts and techniques of Soil Mechanics.

Title	Name	Signature
Course coordinator	**Dr. Mounir Rada Kamel**	
Program Coordinator:	**Asso. Prof. Dr. Ahmed Hamdy**	
Head of Department	**Prof. Dr. Sherif Khafaga**	
Date of Approval	**09/2023**	

	Ministry of Higher Education **Higher Institute of and Technology, Fifth Settlement** **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 (2nd Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	-	5

2. Course Aims

No.	Aim
AM3	Give the students the knowledge and expertise to draw the internal force of statically indeterminate structure using several techniques.
AM5	Make it possible for graduates to pursue continuing education and self-learning, and to qualify for advanced scientific degrees in structural analysis.

3. Course Learning Outcomes (CLOs)

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,

4. Course Contents

Week No.	Topics

1	Introduction into approximate method
2	Approximate Method on Beams
3	Approximate Method on Portal Frames (Part 1)
4	Approximate Method on Portal Frames (Part 2)
5	Approximate Method on Frames (Part 1)
6	Approximate Method on Frames (Part 2)
7	**MidTerm Exam.**
8	Approximate Method on Trusses
9	Introduction into shell analysis
10	Normal Stresses on Shell
11	Shear Stresses on Shell
12	Introduction into Folded Plates
13	Folded Plates (slab action)
14	Final Reevision
15	**Final Exam.**

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	CLOs
1	Attendance	-------
2	Reports	-------
3	Sheets	CLO1, CLO2, CLO22
4	Quizzes	CLO1, CLO2, CLO22
5	Mid-term Exam	CLO1, CLO2, CLO22
6	Oral/ Practical Exam	-------
7	Final Exam	CLO1, CLO2, CLO22

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports / Sheets	Bi-weekly
3	Quizzes	Bi-weekly
4	Mid-term Exam	7
5	Oral/ Practical Exam	-
6	Final Exam	14

7.3 Weighting of Assessments

	Assessment Method	Weights%	Weights	Weights%	Weights
Teacher Opinion	Reports	40%	40	-	-
	Sheets			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	Written exam	60%	60	60%	60
Total		100%	100	100	100

8. List of References

[1] Blaauwendraad, J., & Hoefakker, J. H. (2014). Structural shell analysis. Solid Mechanics and its Applications, 2000.

[2] Megson, T. H. G. (2019). Structural and stress analysis. Butterworth-Heinemann.

[3] Spillers, W. R., & MacBain, K. M. (2009). Structural optimization. Springer Science & Business Media.

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

Week No.	Topics	Aim	LOs
1	Introduction into approximate method	3,5	CLO1, CLO2, CLO22
2	Approximate Method on Beams	3,5	CLO1, CLO2, CLO22
3	Approximate Method on Portal Frames (Part 1)	3,5	CLO1, CLO2, CLO22
4	Approximate Method on Portal Frames (Part 2)	3,5	CLO1, CLO2, CLO22
5	Approximate Method on Frames (Part 1)	3,5	CLO1, CLO2, CLO22
6	Approximate Method on Frames (Part 2)	3,5	CLO1, CLO2, CLO22
8	Approximate Method on Trusses	3,5	CLO1, CLO2, CLO22
9	Introduction into shell analysis	3,5	CLO1, CLO2, CLO22
10	Normal Stresses on Shell	3,5	CLO1, CLO2, CLO22
11	Shear Stresses on Shell	3,5	CLO1, CLO2, CLO22
12	Introduction into Folded Plates	3,5	CLO1, CLO2, CLO22
13	Folded Plates (slab action)	3,5	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, 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,

Title	Name	Signature
Course coordinator	**Dr. Khaled Samy**	Dr. Khaled Samy
Program Coordinator:	**Dr. Khaled Samy**	Dr. Khaled Samy
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**10/2023**	

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

Course Specification

Course Code: CVE4262 Course Title: Concrete Durability

1. 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 (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	1		4

2. 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, …)

3. 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

1. Course Contents

Topics	Week No.
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
Structures underground water Types of protections for underground water Structures	7
How to evaluate defects in concrete structure	8
How to evaluate defects in concrete structure	10
Destructive tests	11
non-destructive tests	12
Restoration of beam and columns	13
Structures underground water Types of protections for underground water Structures	14
Final Revision	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
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
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	Structures underground water	AM2, AM3	CLO12,CLO26,CLO24
8	How to evaluate defects in concrete structure	AM2, AM3	CLO12, CLO24,CLO26
10	How to evaluate defects in concrete structure	AM2, AM3	CLO12,CLO26,CLO24
11	Destructive tests	AM2, AM3	CLO12,CLO26,CLO24
12	non-destructive tests	AM2, AM3	CLO12, CLO26
13	Restoration of beam and columns	AM2, AM3	CLO12, CLO26
14	Structures underground water	AM2, AM3	CLO12, CLO24,CLO26
15	Final Revision	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 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 destructive and non-destructive tests to applying a full range of civil engineering techniques to evaluate the concrete structure
PLO12	Achieve an optimum design of	CLO24	Manage construction processes; address

	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.		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. Mamdouh Tawakol**	M. Tawakol
Program Coordinator:	**Dr.Kaled samy**	Dr. Khaled Samy
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
Date of Approval	**15/9/2024**	