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

Course Specification

Course Code: CVE 3204 **Course Title: Sanitary Engineering (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 3204			
Year/level	Third year / second Semester (2^{nd} Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	-	6

2. 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.

3. 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.
CLO24	Achieve an optimum design of collection and storage water works and networks.

4. Course Contents

Week No.	Topics
1	Introduction
2	Population prediction
3	Water consumption
4	Introduction to water supply system
5	collection works (intake conduits)
6	collection works (sump and low lift pump)
7	**MidTerm Exam**
8	Storage works (ground reservoir)
9	Storage works (elevated tank)
10	Disinfection
11	Introduction to distribution system
12	Investigation of Pipe networks
13	Water quality parameters
14	**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

CLO4	√	-	√	√	-	√	-	-	-	-	-	-
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	CLO4,6, 24
3	Quizzes	CLO4,6, 24
4	Mid-term Exam	CLO6, 24
5	Practical Exam	--------
6	Final Exam	CLO4,6, 24

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Sheets	Bi-weekly
3	Quizzes	4, 6 & 10
4	Mid-term Exam	7
5	Practical Exam	-
6	Final Exam	14

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	60%	60
Total		100%	100	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

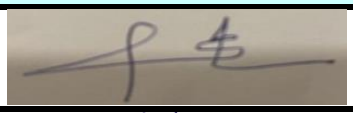
Lecture/Classroom
White board
Lecture room equipped with e-learning tools (computer, internet, mike, headphones, etc.)
Moodle and Microsoft teams
Data show
Laboratory Usage

10. Matrix of Course Content with Course LO's

No.	Topics	Aim	Los
1	Introduction	AM2	…….
2	Population prediction	AM2	CLO4
3	Water consumption	AM2	CLO4
4	Introduction to water supply system	AM2	……..
5	Design of collection works (intake conduits)	AM2	CLO6, 24
6	Design of collection works (sump and low lift pump)	AM2	CLO6, 24
8	Storage works (design of ground reservoir)	AM2	CLO6, 24
9	Storage works (design of elevated tank)	AM2	CLO4,6, 24
10	Introduction to distribution system	AM2	CLO6
11	distribution system	AM2	CLO24
12	Investigation of Pipe networks	AM2	CLO24
13	Water quality parameters	AM2	CLO24

11. 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 processes that meets specified needs.	CLO6	Apply engineering design process in collection, storage and Disinfection works to produce low cost solutions.
PLO12	Achieve an optimum design in Sanaitary works strategies.	CLO24	Achieve an optimum design of collection and storage water works and networks.

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

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

Course Specification

Course Code: CVE 3201 **Course Title: Design of R.C structures (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 3201			
Year/level	Third year / second Semester (2^{nd} Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2		4

2. Course Aims

No.	Aim
2	Teach the students how to think about and design problems and requirements using scientific methods (AM2)
3	Give the students the knowledge to start a small project (AM3)

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.
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

4. Course Contents

Topics	Week
Introduction	1
Design of girders	2
Design of 2-hinged frames	3
Design of 3-hinged frames	4
Design of 2-fixed frames	5
Design of arch girder	6
Design of triangle polygon	7
Design of trapezoidal polygon	8
Mid term exam	9
Design of arch slab	10
Design of cantilever frame	11
Design of arch slab supported on cantilever frame	12
Final revision	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	Modeling and Simulation

CLO6	√			√			√					
CLO8	√			√			√					
CLO16	√			√						√	√	
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, CLO16, CLO24
3	Quizzes	
4	Mid-term Exam	CLO6, CLO8, CLO16,
5	Practical Exam	
6	Final Exam	CLO6, CLO8, CLO16, CLO24

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	---	-----
	Attendance			---	-----
	Quizzes			20%	20
	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] Bandyopadhyay (2008) Design of concrete strctures. Prentice-Hall

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	AM2	CLO16, CLO6
2	Design of girders	AM2,AM3	CLO16, CLO6
3	Design of 2-hinged frames	AM2,AM3	CLO16, CLO6, CLO8
4	Design of 3-hinged frames	AM2,AM3	CLO16, CLO6
5	Design of 2-fixed frames	AM2	CLO16, CLO6
6	Design of arch girder	AM2	CLO16, CLO6
7	Design of triangle polygon	AM2	CLO16, CLO24
8	Design of trapezoidal polygon	AM2	CLO16, CLO6,CLO24
9	Mid term exam	AM2	CLO16, CLO6,CLO24
10	Design of arch slab	AM3	CLO16, CLO6, CLO8
11	Design of cantilever frame	AM2,AM3	CLO16, CLO6
12	Design of arch slab supported on cantilever frame	AM2,AM3	CLO16, CLO6
13	Design of Bases	AM2,AM3	CLO16, CLO6
14	Final revision	AM2,AM3	CLO16, CLO6
15	Final exam	AM2,AM3	CLO16, CLO24

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.
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

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: CVE 3102 **Course Title: Design of R.C structures (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 3102			
Year/level	Third year / fourth 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	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.(AM4)

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.
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

4. Course Contents

Topics	Week
Introduction	1
Design of solid slabs (part1)	2
Design of solid slabs (part2)	3
Design of hollow block slabs	4
Design of hollow block slabs	5
Design of paneled beams	6
Design of sections subjected to torsion	7
Design of sections subjected to torsion and shear	8
Mid term exam	9
Design of slab-type stairs	10
Design of beam-type stairs	11
Design of cantilever-type stairs	12
Drawing reinforcement of all types of slabs	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	√			√			√					
CLO16	√			√						√	√	
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	-
3	Quizzes	CLO6, CLO8, CLO16, CLO24
4	Mid-term Exam	CLO6, CLO8, CLO16,
5	Practical Exam	
6	Final Exam	CLO6, CLO8, CLO16, 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	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.

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	AM2,AM4	CLO16,CLO6
2	Design of solid slabs (part1)	AM2,AM4	CLO16,CLO6
3	Design of solid slabs (part2)	AM2,AM4	CLO8,CLO6,CLO16
4	Design of hollow block slabs	AM2,AM4	CLO8,CLO6,CLO16
5	Design of hollow block slabs	AM2,AM4	CLO16,CLO6
6	Design of paneled beams	AM2,AM4	CLO16,CLO6
7	Design of sections subjected to torsion	AM2	CLO8 ,CLO24
8	Design of sections subjected to torsion and shear	AM2,AM4	CLO6,CLO8,CLO24
9	Mid term exam	AM2	CLO6,CLO8,CLO24
10	Design of slab-type stairs	AM2,AM4	CLO16,CLO6
11	Design of beam-type stairs	AM2,AM4	CLO16,CLO6
12	Design of cantilever-type stairs	AM2,AM4	CLO8,CLO6,CLO16
13	Drawing reinforcement of all types of stairs	AM2,AM4	CLO8,CLO6,CLO16
14	Final revision	AM2,AM4	CLO6,CLO8,CLO16,CLO24
15	Final exam	AM2,AM4	CLO6,CLO8,CLO24,CLO16

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
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

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-fivth setllement** **Civil Engineering Department**	

Course Specification

Course Code: CVE 3105 **Course Title:** Engineering Survey

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 3105			
Year/level	third year / fourth level (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	3	2	-	5

2. 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.

3. 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.

4. Course Contents

Topics	Week
Role of surveying in engineering projects	1
Total station instrument and its applications	2
Methods of setting out of sewer and infrastructure networks	3
Planning of Horizontal Curve	4
Planning of Vertical Curve	5
Deformation monitoring techniques	6
Surveying reports for different Engineering projects	7
Introduction to geometric geodesy	8
Medterm	9
Map projection	10
Coordinate transformation	11
Introduction to GNSS	12
Introduction to GIS	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

CLO2	√	√		√								
CLO15	√	√		√								
CLO16										√	√	
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 / Sheets	CLO2, CLO15, CLO16, CLO22
3	Quizzes	CLO2, CLO15, CLO22
4	Mid-term Exam	CLO2, CLO22
5	Practical Exam	-------
6	Final Exam	CLO2, CLO15, CLO16

7.2 Assessment Schedule

No.	Assessment Method	Weeks
1	Attendance	Weekly
2	Reports	Bi-weekly
3	Sheets	Bi-weekly
4	Quizs	4 & 10
5	Mid-term Exam	9
6	Practical Exam	-
7	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
Practical	Practical Attendance	-	-		
	Lab. Reports				
	Lab. Activities / Projects				
	practical exam			-	-
Final Exam		60%	60		
Total		100%	100		

8. 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.

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	Role of surveying in engineering projects	AM4,AM7	CLO2, CLO15
2	Total station instrument and its applications	AM4	CLO2, CLO22
3	Methods of setting out of sewer and infrastructure networks	AM4,AM7	CLO2, CLO15, CLO16, CLO22
4	Planning of Horizontal Curve	AM7	CLO15, CLO22
5	Planning of Vertical Curve	AM7	CLO2, CLO15, CLO16, CLO22
6	Deformation monitoring techniques	AM4,AM7	CLO2, CLO15, CLO16, CLO22
7	Surveying reports for different Engineering projects	AM4,AM7	CLO16
8	Introduction to geometric geodesy	AM4,AM7	CLO16
9	Map projection	AM4	CLO2, CLO16, CLO22
10	Coordinate transformation	AM4	CLO2, CLO15
11	Introduction to GNSS	AM4	CLO16, CLO22
12	Introduction to GIS	AM4	CLO16, 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.	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**	Dr. A. Hamdy
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 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.

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
Midterm week	7
Construction methods of piles	8
Eid El Fater	9
Determination of pile capacity	10
Design of pile caps	11
Retaining walls constructions	12
Tunnels	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

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	CLO3, CLO17
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	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	Application project	40%	40	15%	15
	Quiz			5%	5
	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., Aguettant, J., & Roussel-Smith, L. (2007). Introduction to soil mechanics laboratory testing. CRC press.
(6) Landau, E. (2022). *Foundations of analysis* (Vol. 79). American Mathematical Society.

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	CLO21,	Select appropriate and

	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, CLO23	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 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 foundations and earth-retaining structures

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

Course Specification

Course Code: CVE 3104 Course Title: Geotechnical 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 3104			
Year/level	third year / First Semester (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2		6

2. 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)

3. Course Learning Outcomes (LOs)

CLO3	Conduct appropriate soil experimentation to draw conclusions.
CLO22	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.

No. of week	Topics
1	Introduction to soil compaction
2	Soil compaction (part 1)
3	Soil compaction (part 2)
4	Introduction to slope stability
5	slope stability (part 1)
6	slope stability (part 2)
7	Lateral earth pressure (part 1)
8	Lateral earth pressure (part 2)
9	**Midterm exam**
10	Retaining walls constructions (part 1)
11	Retaining walls constructions (part 2)
12	Sheet pile wall (part 1)
13	Sheet pile wall (part 2)
14	Revision
15	Final Exam

3. 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				√	√							
CLO22	√	√	√	√	√							

CLO23	√		√	√	√	√	√			√	√	
CLO24	√	√	√	√		√	√			√	√	

4. Teaching and Learning methods of Disabled Students

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

5. Students' Assessment

7.1 Students' Assessment Method

No.	Assessment Method	LOs
1	Attendance	-------
2	Reports / Sheets	CLO3, CLO22, CLO23, CLO24
3	Quiz 1 / Quiz 2	
4	Mid-term Exam	CLO22, CLO23, CLO24
5	Oral/ Practical Exam	
6	Final Exam	CLO3, CLO22, 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		

6. 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.

7. 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

8. Matrix of Course Content with Course LO's

No.	Topics	Aim	LOs
1	Introduction to soil compaction	Aim3, Aim5	CLO22, CLO24
2	Soil compaction (part 1)	Aim3, Aim5	CLO22, CLO24
3	Soil compaction (part 2)	Aim3, Aim5	CLO22, CLO24
4	Introduction to slope stability	Aim3, Aim5	CLO3, CLO22, CLO23, CLO24
5	slope stability (part 1)	Aim3, Aim5	CLO22, CLO24
6	slope stability (part 2)	Aim3, Aim5	CLO22, CLO24
7	Lateral earth pressure (part 1)	Aim3, Aim5	CLO3, CLO22, CLO23, CLO24
8	Lateral earth pressure (part 2)	Aim3, Aim5	CLO3, CLO22, CLO23, CLO24
10	Retaining walls constructions (part 1)	Aim3, Aim5	CLO22, CLO24
11	Retaining walls constructions (part 2)	Aim3, Aim5	CLO3, CLO22, CLO23, CLO24
12	Sheet pile wall (part 1)	Aim3, Aim5	CLO3, CLO22, CLO23, CLO24
13	Sheet pile wall (part 2)	Aim3, Aim5	CLO3, CLO22, CLO23, CLO24
14	Practical Exam		

9. Matrix of Program LOs with Course Los

Program LOs		Course LOs	
PLO1	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	CLO22	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

	and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.		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 emerging field relevant to the discipline.	CLO24	Achieve an optimum design of Foundations and Earth Retaining Structures.

Title	Name	Signature
Course coordinator	**Dr. Nesrin Ali Morsy**	
Program Coordinator:	**Dr. khaled Samy Abdallah**	
Head of Department	**Asso. Prof. Dr. Ahmed 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 3103Course Title: Steel Structures Design (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 3103			
Year/level	third year / first Semester (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2	0	4

2. Course Aims

No.	Aim
AM1	Provide a professional engineer capable of working efficiently and effectively in steel structures area design.

3. CourseLearning Outcomes (CLOs)

CLO1	Identify steel types and its properties.
CLO2	Solve complex steel design problems by applying structure analyzing fundamentalsand mathematics.

4. Course Contents

Topics	Week
Introduction, Philosophies of steel structure.	1
Systems and Uses, Materials, Design in steel structure.	2
Structural systems and general layout.[1]	3
Structural systems and general layout.[2]	4
Loads, Classification of Sections, Slenderness Ratios and Buckling Lengths and Analysis and design concepts, ASD, LRFD design concepts.[1]	5
Loads, Classification of Sections, Slenderness Ratios and Buckling Lengths and Analysis and design concepts, ASD, LRFD design concepts.[2]	6
Design of tension members.	7
midterm	8
Design of axially loaded compression members.	9
Types of connections in steel structures (simple connection, shear connection, moment connections)	10
Design of non-pretension, pretention bolted connections (Shear, Tension & Shear + Tension) and details of bolted connections.[1]	11
Design of non-pretension, pretention bolted connections (Shear, Tension & Shear + Tension) and details of bolted connections.[2]	12
Design of welded connections and details of welded connections.	13
Revision	14
Final exam	15

5. 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
CLO1	√	√		√		√	√					√
CLO2			√		√	√	√				√	√

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	Sheets	CLO1, CLO2,
3	Quizzes	CLO1
4	Mid-term Exam	CLO1, CLO2
5	Final Exam	CLO1, CLO2

7.2Assessment 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	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 CourseCLO's

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

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 steel types and its properties.
		CLO2	Solve complex steel design problems by applying structure analyzing fundamentalsand mathematics.

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 3202 **Course Title: Steel Structures Design (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 **3202**			
Year/level	third year / second Semester (2^{nd} Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	2	2	0	4

2. 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).

3. 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.

4. Course Contents

Topics	Week
Calculation of steel sections properties	1
load calculation on steel beams	2
design of steel beams (hot rolled &built-up sections)	3
Examples for design of steel beams (hot rolled).	4
design of steel beams (built-up sections)	5
Examples for design of steel beams (built-up sections).	6
Midterm week	7
Calculation of straining actions acting on steel columns.	8
Eid El Fater	9
design of steel columns subjected to normal forces and biaxial moments.	10
calculation of loads acting on cranes track girders	11
design of crane track girders.	12
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

CLO1	√	√		√		√	√					√
CLO2			√		√	√	√				√	√
CLO6	√	√	√	√	√	√	√					√

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	Sheets	CLO1, CLO2,
3	Quizzes	CLO1
4	Mid-term Exam	CLO1, CLO2
5	Final Exam	CLO1, CLO2

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	10%	10
	Attendance			10%	10
	Quizzes				
	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	CLOs
1	Calculation of steel sections properties	1,	CLO1,
2	load calculation on steel beams	1	CLO1, CLO2
3	design of steel beams (hot rolled &built-up sections)	1,3	CLO1, CLO6
4	Examples for design of steel beams (hot rolled).	1,3	CLO1, CLO2, CLO6
5	design of steel beams (built-up sections)	1	CLO1, CLO2,
6	Examples for design of steel beams (built-up sections).	1,3	CLO1, CLO2, CLO6
7	Calculation of straining actions acting on steel columns. design of crane track girders.	1,3	CLO1, CLO2, CLO6
8	design of steel columns subjected to normal forces and uniaxial moment	1,3	CLO1, CLO2 CLO6
9	Midterm	1,3	CLO1, CLO2 CLO6

10	design of steel columns subjected to normal forces and biaxial moments.	1	CLO1, CLO2,
11	calculation of loads acting on cranes track girders	1,3	CLO1, CLO6
12	design of crane track girders.	1	CLO1, CLO2,
13	Examples for design of crane track girders.	1,3	CLO1, CLO2, CLO6
14	Final Revision	1,3	CLO1, CLO2, CLO6
15	Final Exam	1,3	CLO1, CLO2, CLO6

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 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.

Title	Name	Signature
Course coordinator	**Dr. Medhat Mahmoud Momtaz**	
Program Coordinator:	**DR.khaled Samy Abdallah**	Dr. Khaled Samy
Head of Department	**Asso. 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: CVE 3101 Course Title: Structural Analysis (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 3101			
Year/level	third year / fourth level (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2		6

2. Course Aims

No.	Aim
AM1	Teach the students how to analysis of indeterminate structures, and introduction into dynamic analysis (AM2).

3. Course 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.

4. Course Contents

Topics	Week No.
Introduction into stiffness matrix analysis	1
Analysis of indeterminate beams using stiffness matrix	2
Determination of internal forces for indeterminate beams	3

Analysis of indeterminate frames using stiffness matrix	4
Determination of internal forces for indeterminate frames	5
Analysis of indeterminate trusses using stiffness matrix	6
Determination of internal forces for indeterminate trusses	7
Introduction into dynamics analysis	8
Mid-term exam	9
Introduction, analysis, and equations of free undamped vibration on beams	10
Introduction, analysis, and equations of Free undamped vibration on frames	11
Introduction, analysis, and equations of Free damped vibration on beams	12
Introduction, analysis, and equations of Free damped vibration on frames, Forced undamped vibration[1]	13
Introduction, analysis, and equations of Free damped vibration on frames, Forced undamped vibration[2]	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	√			√		√						

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
3	Quizzes	CLO1, CLO2
4	Mid-term Exam	CLO1, CLO2
5	Practical Exam	-------
6	Final Exam	CLO1, CLO2

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			-	-
	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		

8. List of References

[1] McGuire, W., Gallagher, R. H., & Ziemian, R. D. (2000). Matrix structural analysis.
[2] Chopra, A. K. (2007). Dynamics of structures. Pearson Education India.
[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.

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 stiffness matrix analysis	AM1	CLO1, CLO2
2	Analysis of indeterminate beams using stiffness matrix	AM1	CLO1, CLO2
3	Determination of internal forces for indeterminate beams	AM1	CLO1, CLO2
4	Analysis of indeterminate frames using stiffness matrix	AM1	CLO1, CLO2
5	Determination of internal forces for indeterminate frames	AM1	CLO1, CLO2
6	Analysis of indeterminate trusses using stiffness matrix	AM1	CLO1, CLO2
7	Determination of internal forces for indeterminate trusses	AM1	CLO1, CLO2
8	Introduction into dynamics analysis	AM1	CLO1, CLO2

9	Introduction, analysis, and equations of free undamped vibration on beams	AM1	CLO1, CLO2
10	Introduction, analysis, and equations of Free undamped vibration on frames	AM1	CLO1, CLO2
11	Introduction, analysis, and equations of Free damped vibration on beams	AM1	CLO1, CLO2
12	Introduction, analysis, and equations of Free damped vibration on frames, Forced undamped vibration	AM1	CLO1, CLO2

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.

Title	Name	Signature
Course coordinator	**Dr. Momdouh Mostafa Tawakol**	
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 and Technology, Fifth Settlement** **Civil Engineering Department**	

Course Specification

Course Code: CVE 3106 **Course Title: Highway engineering and Airports**

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 3106			
Year/level	Third year / 4th level (1st Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2		6

2. Course Aims

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

3. Course Learning Outcomes (CLOs)

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.

4. Course Contents

Week No.	Topics
1	Introduction: Highway System Development, Highway Functional Classifications, Highway Organizations and Associations.
2	Highway Travel Characteristics.
3	Highway Driver and Vehicle Characteristics.
4	Highway Surveys and Plans: Highway routs Location, Highway Plans.
5	Highway Geometric Design: Sight Distances.
6	Highway Geometric Design: Vertical Alignments.
7	Highway Geometric Design: Horizontal Alignments.
8	Cross Section Elements
9	**MidTerm Exam**
10	Interchanges and Intersection.
11	Soil classification
12	Bituminous Materials: Aggregates and Asphalt.
13	Mix Design: Marshall Method.
14	Pavement Structural Design: Principles, Methods.
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

CLO6	√	√	√	√	-	√	-	-	-	√	√	-
CLO7	√	√	-	√	-	-	-	-	-	√	√	-
CLO12	-	-	-	-	-	-	√	-	-	√	√	-
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	Reports	CLO6, CLO7, CLO12, CLO24
3	Sheets	CLO6, CLO7, CLO12, CLO24
4	Quiz 1 / Quiz 2	-------
5	Mid-term Exam	CLO6, CLO7, CLO24
6	Oral/ Practical Exam	-------
7	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	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

8. 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.

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

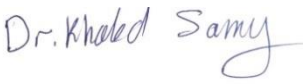
10. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LOs
1	Introduction: Highway System Development, Highway Functional Classifications, Highway Organizations and Associations.	1	CLO6, CLO7, CLO12
2	Highway Travel Characteristics.	1	CLO6, CLO7
3	Highway Driver and Vehicle Characteristics.	1	CLO6, CLO7
4	Highway Surveys and Plans: Highway routs Location, Highway Plans.	1,5	CLO6, CLO7, CLO12
5	Highway Geometric Design: Sight Distances.	1,2,5	CLO6, CLO24
6	Highway Geometric Design: Vertical Alignments.	1,2,5	CLO6, CLO7, CLO24
7	Highway Geometric Design: Horizontal Alignments.	1,2,5	CLO6, CLO7, CLO24
8	Cross Section Elements	1,5	CLO6, CLO12, CLO24
10	Interchanges and Intersection.	1,2,5	CLO6, CLO7, CLO24
11	Soil classification	1,5	CLO6, CLO24
12	Bituminous Materials: Aggregates and Asphalt.	1,5	CLO6, CLO24
13	Mix Design: Marshall Method.	1,2,5	CLO6, CLO24
14	Pavement Structural Design: Principles, Methods.	1,2,5	CLO6, CLO24

11. 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 highway design to produce cost-effective solutions.
		CLO7	Meet specified needs for highway design with consideration for social, economic, and environmental aspects.
PLO5	Practice research techniques	CLO12	Practice research techniques and methods

	and methods of investigation as an inherent part of learning		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 Elgandy**	
Program Coordinator:	**Dr. khaled Samy Abdallah**	
Head of Department	**Asso. Prof. Dr. Ahmed Hamdy**	
Date of Approval	**09/2023**	

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

Course Specification

Course Code: CVE 3205 **Course Title: Transportation Planning and Traffic 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 3205			
Year/level	Third year / 4th level (2nd Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	-	6

2. 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.

3. 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.

4. 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.**

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	√	√	√	√	-	√	-	-	-	-	√	-
CLO7	√	√	-	√	-	-	-	-	-	-	√	-
CLO22	√	-	√	√	-	√	√	-	-	-	√	-
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	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	-	-
	Sheets			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	Written exam	60%	60	60%	60
Total		100%	100	100	100

8. 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".

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

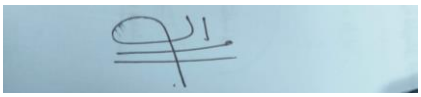
10. Matrix of Course Content with Course LO's

Week No.	Topics	Aim	LOs
1	Introduction: 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

11. 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 design to produce cost-effective solutions.
		CLO7	Meet specified needs for traffic design with consideration for social, economic, and environmental aspects.
PLO11	Select appropriate and sustainable technologies for	CLO22	Use numerical techniques by applying a full range of civil engineering concepts

	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.		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**	
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: CVE3203 **Course Title:** Design of Irrigation Works (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	CVE3203			
Year/level	Third year / Fourth level (2nd Semester)			
Specialization	**Major**			
Teaching Hours	Lectures	Tutorial	Practical	Total
	4	2	0	6

2. Course Aims

No.	Aim
AM1	Provide a professional engineer capable of working efficiently and effectively in water structures design (AM1).
AM2	Teach the students to practice the methodology in thinking and describing water structures design problems (AM2).
AM3	Give the students the knowledge and technical skills to design and implement water structures projects by utilizing modern technologies through proper planning and participatory work (AM3).

3. Course Learning Outcomes (LOs)

CLO1	Identify the best layout of irrigation and drainage network and water structures classification.
CLO15	Participates in teamwork efficiently.
CLO24	Design the optimum sections for water structures.
CLO25	Manage time for construction processes of irrigation and drainage projects.

4. Course Contents

Topics	Week. No
Alignment of canals and drains nets	1
Synoptic diagram	2
Area served of canals and Drains	3
Design of canals and drains cross sections	4
Water structure classification	5
Design of Arch bridges	6
Design of R.C. Bridges	7
Design of culvert	8
Mid-term exam	9
Design of Syphon[1]	10
Design of Syphon[2]	11
Design of Aqueduct	12
Design of tail escape [1]	13
Design of tail escape [2]	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	√	√		√		√						
CLO15								√				
CLO24	√	√		√		√				√		
CLO25								√				

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, CLO24, CLO25
3	Quizzes	CLO1, CLO24
4	Mid-term Exam	CLO1, CLO24
5	Oral Exam	------
6	Final Exam	CLO1, CLO24

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

8. List of References

[1] William George Bligh, The Practical Design of Irrigation Works Classic Reprint, 2020, ISBN: 1332329349, Pages: 438.

[2] Asawa, G.L, "Irrigation and Water Resources Engineering", New Age International, 2006, ISBN: 812241673X, 9788122416732, https://easyengineering.net/irrigat…

[3] Sharma, R. K., and T. K. Sharma. A Textbook of Water Power Engineering. S. Chand Publishing, 2003.

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	LO's
1	Alignment of canals and drains nets	AM1, AM2	CLO1, CLO15, CLO25
2	Synoptic diagram	AM1, AM2	CLO1, CLO15, CLO25
3	Area served of canals and Drains	AM1, AM2	CLO1, CLO25
4	Design of canals and drains cross sections	AM1, AM2	CLO1, CLO15, CLO25
5	Water structure classification	AM1, AM2	CLO1, CLO15, CLO25
6	Design of Arch bridges	AM1, AM2	CLO24, CLO25
7	Design of R.C. Bridges	AM1, AM2	CLO24, CLO25
8	Design of culvert	AM1, AM2	CLO24, CLO25
9	Design of Syphon [1]	AM1, AM2, AM3	CLO24, CLO15, CLO25
10	Design of Syphon [2]	AM1, AM2, AM3	CLO24, CLO15, CLO25
11	Design of Aqueduct	AM1, AM2, AM3	CLO24, CLO15, CLO25
12	Design of tail escape [1]	AM1, AM2	CLO24, CLO15, CLO25

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 the best layout of irrigation and drainage network.
PLO7	Function efficiency as an individual and as a member of	CLO15	Participates in teamwork efficiently.

	multi-disciplinary and multicultural teams.		
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	Design the optimum sections for water 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.	CLO25	Manage time for construction processes of irrigation and drainage projects.

Title	Name	Signature
Course coordinator	**Asso. Prof. Dr. Ahmed Hamdy**	Dr. A. Hamdy
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**	