1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department + Hydraulics Engineering Department.
Department Responsible for the Course	Irrigation and Hydraulics Engineering
Course Name	Hydraulics 1
Course Code	IRH8211
Year/ Level	Second Year-First Semester
Specialization	Major
Authorization data of course specification	12/2021

Teaching Hours	Lectures	Tutorial	Practical
	4	1	1

2. Course aims:

No.	Aim
2	Apply knowledge of math, science, engineering, and fluid mechanics concepts to identify, formulate, and solve hydraulics problems.

3. Learning Outcomes (LOs):

No.	LOs
A3.1	Apply engineering design processes to produce Hydraulics solutions that meet specified needs with consideration for environmental aspects.
A4.1	Utilize contemporary technologies in implementing Hydraulics solutions.
B1.1	Select appropriate and sustainable technologies for understanding and interpretation of fluids properties and phenomena; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: hydraulics and fluid mechanics.

4. Course Contents:

No.	Topics	week
1	Introduction	W1
2	Dimensions & Units	W2
3	Fluid Forces on bodies	W3, W4, W5
4	Acceleration & floating	W6, W7
5	kinematic of fluid flow	W9
6	Application of Bernoulli's equation	W10, W11
7	Dimensional analysis	W12
8	Pipelines and network	W13, W14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom
4	Practical

6.Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B1.1, A3.1
2	Semester work (Quizzes, presentation, Portfolio)	B1.1, A4.1
3	Oral Examination	B1.1, A3.1
4	Practical Examination	B1.1, A4.1
5	Final Term Examination	B1.1, A3.1

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	8
2	Semester work (Quizzes, presentation, Portfolio)	weekly
3	Oral Examination	14
4	Practical Examination	14
5	Final Term Examination	15

7.3 Weighting of Assessment:

No.	Assessment Method	Weights
1	Mid Term Examination	16.67 %
2	Oral Examination	6.67%
3	Practical Examination	6.67 %
4	Semester work (Quizzes, presentation, Portfolio)	10%
5	Final Term Examination	60 %
Total		100%

8. List of References

No.	Reference List
1	Manish Kumar "Fluid Mechanics and Hydraulic Machines" Pearson India Education Services Pvt. Ltd, 2019.
2	Richard M. McCuen "Fluid Mechanics for Civil and Environmental Engineers" CRC press, 2018

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	Aims	LO's
1	Introduction	2	B1.1, A3.1
2	Dimensions & Units	2	B1.1, A4.1
3	fluid Forces on bodies	2	B1.1, A3.1
4	Acceleration & floatation	2	B1.1, A3.1
5	kinematic of fluid flow	2	B1.1, A4.1
6	Application of Bernoulli's equation	2	B1.1, A3.1
7	Dimensional analysis	2	B1.1, A3.1
8	Pipelines and network	2	B1.1, A4.1

Course Coordinator: Assoc. Prof. Dr. Hossam Abd-Elaziz

Head of Department: Assoc. Prof. Dr. Tharwat Eid Sarhan

Date of Approval: 12/2021

Course: Hydraulics 1	
Program LOs	**Course LOs**
A3. 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 .	A3.1 Apply engineering design processes to produce Hydraulics solutions that meet specified needs with consideration for environmental aspects.
A4. Utilize contemporary technologies, codes of practice, and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles .	A4.1 Utilize contemporary technologies in implementing Hydraulics solutions.
B1. Select appropriate and sustainable technologies for construction of buildings and infrastructures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	B1.1 Select appropriate and sustainable technologies for understanding and interpretation of fluids properties and phenomena; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: hydraulics and fluid mechanics.

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department + Hydraulics Engineering Department.
Department Responsible for the Course	Irrigation and Hydraulics Engineering
Course Name	Irrigation and drainage engineering
Course Code	IRH8212
Year/ Level	Second Year-First Semester
Specialization	Major
Authorization date of course specification	12/2021

Teaching Hours	Lectures	Tutorial	Practical
	2	2	0

2. Course aims:

No.	Aim
1	Master a wide range of hydraulics and hydrology knowledge, techniques and skills to use them in irrigation and drainage projects.

3. Learning Outcomes (LOs):

No.	LOs
B1.1	Apply a full range of civil engineering concepts and techniques of Irrigation requirements and water resources to design the network of canals and drains.
B1.2	Select appropriate and sustainable technologies for management of irrigation drainage projects
B2.1	Achieve an optimum design for Sprinkler irrigation system and drainage networks.

4. Course Contents:

No.	Topics	week
1	Introduction to Irrigation	W1
2	Irrigation water requirements	W2, W3
3	water resources in Egypt	W4, W5
4	Design the network of canals and drains	W6, W7, W9
5	Management and distribution of irrigation water	W10, W11
6	Sprinkler irrigation system	W12, W13
7	Drainage principles (Open drains - subsurface drains)	W14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions

3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B1.1, B1.2
2	Semester work (Quizzes, presentation, Portfolio)	B1.1, B1.2, B2.1
3	Final Term Examination	B1.1, B1.2, B2.1

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	**8**
2	Semester work (Quizzes, presentation, Portfolio)	**weekly**
3	Final Term Examination	**15**

7.3 Weighting of Assessment:

No.	Assessment Method	Weights
1	Mid Term Examination	20 %
2	Semester work (Quizzes, presentation, Portfolio)	10 %
3	Final Term Examination	70 %
Total		100%

8. List of References

No.	Reference List
1	Omran, El-Sayed E., and Abdelazim M. Negm, eds. "Technological and Modern Irrigation Environment in Egypt: Best Management Practices & Evaluation." Springer Nature, 2020.
2	Chaudhry, S. and Garg, Sh. "Smart Irrigation Techniques for Water Resource Management". IGI Global Publisher of Timely Knowledge, 2019
3	Waller, Peter, and Muluneh Yitayew. "Irrigation and drainage engineering", Springer, 2016.

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Introduction to Irrigation	1	B1.1
2	Irrigation water requirements	1	B1.1
3	water resources in Egypt	1	B1.1
4	Design the network of canals and drains	1	B1.1, B1.2
5	Management and distribution of irrigation water	1	B1.1, B1.2
6	Sprinkler irrigation system	1	B1.1, B2.1
7	Drainage principles (Open drains - subsurface drains)	1	B1.1, B1.2, B2.1

Course Coordinator: **Dr. Ahmad Mohammad Sedki Elhamrawy**

Head of Department: **Assoc. Prof. Dr. Tharwat Eid Sarhan**

Date of Approval: **12/2021**

Course: Irrigation and drainage engineering	
Program LOs	**Course LOs**
B1. Select appropriate and sustainable technologies for construction of buildings and infrastructures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	B1.1 Apply a full range of civil engineering concepts and techniques of Irrigation requirements and water resources to design the network of canals and drains. B1.2 Select appropriate and sustainable technologies for management of irrigation drainage projects.
B2. 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.	B2.1 Achieve an optimum design for Sprinkler irrigation system and drainage networks.

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department +Irrigation and Hydraulics Engineering Department
Department Responsible for the Course	Public Works Engineering Department
Course Code	PWE 8214
Year/ Level	Second Year-First Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	0	0

2. Course aims:

No.	Aim
3	Design system with reducing the environmental pollution

3. Learning Outcomes (LOs):

A2.1	Develop appropriate experimentations for water pollution control
A2.2	Conduct appropriate experimentations to reach the most appropriate solution of air pollution control
A6.1	Plan engineering projects taking in consideration its effect on environment
A6.2	Monitor implementation of engineering projects taking into consideration risk perception
A6.3	Plan engineered Systems for Solid Wastes Management

No.	Topics	week
1	Environmental Engineering Introduction and Definitions	1
2	Water Sources and Its Quality	1
3	Physical, Chemical and Biological Water Quality Parameters,	2
4	Drinking and Wastewater Standards	3
5	Mass Balance Principal in some Environmental Systems	4
6	Water Purification in Natural Systems	5
7	Wastewater Reclamation and Reuse	6
8	Solid Wastes: Introduction, Definitions, Characteristics and Perspectives	7
9	Solid Wastes Management: An Overview	10
10	Engineered Systems for Solid Wastes Management	11
11	Air Quality: Definitions – Characteristics and Perspectives	12

12	Engineered Systems for air pollution control (Self-study)	13
13	Environmental Engineering Evaluation (EIA)	14

4. Course Contents:

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Semester work (Quizzes, presentation, Portfolio)	**A2.1 A2.2**
2	Final Term Examination	**A2.1 A2.2 A6.1 A6.2 A6.3**

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Semester work (Quizzes, presentation, Portfolio)	weekly
2	Final Term Examination	15

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Semester work (Quizzes, presentation, Portfolio)	33.33%
2	Final Term Examination	66.67%
Total		100 %

8. List of References

No.	Reference List
1	***Judith Petts, "Handbook of Environmental Impact Assessment", 2010***
2	***Baarrba Carroll, Josh Fothergill, Jo Murphy and Trevor Turpin, "Environmental Impact Assessment Handbook", 2015***

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Environmental Engineering Introduction and Definitions	3	**A2.1**
2	Water Sources and Its Quality	3	**A2.1**
3	Physical, Chemical and Biological Water Quality Parameters,	3	**A2.1 A2.2**
4	Drinking and Wastewater Standards	3	**A2.1 A6.2**
5	Mass Balance Principal in some Environmental Systems	3	**A2.1**
6	Water Purification in Natural Systems	3	**A2.2**
7	Wastewater Reclamation and Reuse	3	**A6.1 A6.2**
8	Solid Wastes: Introduction, Definitions, Characteristics and Perspectives	3	**A2.1 A6.3**
9	Solid Wastes Management: An Overview	3	**A2.2**
10	Engineered Systems for Solid Wastes Management	3	**A6.2**
11	Air Quality: Definitions – Characteristics and Perspectives	3	**A2.1 A2.2 A6.1**
12	Engineered Systems for air pollution control (Self-study)	3	**A2.1 A6.3**
13	Environmental Engineering Evaluation (EIA)		**A2.1 A6.3**

Course Coordinator:

Head of Department: Prof. Dr.

Date of Approval: December 2021

Course: Environmental Sciences	
Program LOs	**Course LOs**
A2. 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.	**A2.1** Develop appropriate experimentations for water pollution control **A2.2** conduct appropriate experimentations to reach the most appropriate solution of air pollution control
A6. Plan, supervise, and monitor implementation of engineering projects, taking into consideration other trades requirements new situations.	**A6.1** plan engineering projects taking into consideration its effect on environment **A6.2** monitor implementation of engineering projects taking into consideration risk perception **A6.3** Plan engineered Systems for Solid Wastes Management.

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department +Irrigation and Hydraulics Engineering Department
Department Responsible for the Course	Public Works Department
Course Code	PWE8217
Year/ Level	Second Year-First Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	1	1

2. Course aims:

No.	Aim
1	Master a wide range of Topographic Surveying & Geodesy techniques to use them in civil engineering projects

3. Learning Outcomes (LOs):

A7.1	Function efficiently as an individual and as a member of a team in theodolite and total Station field work applications .
B1.1	Apply a full range of Geodesy concepts and techniques in Observations, data corrections and reductions
B1.2	Apply numerical techniques for Reduction of observations to the projection plane
B3.1	Manage construction processes by Total Station Measurement of observations.
B3.2	Plan Network adjustment and Analysis of adjustment .

4. Course Contents:

No.	Topics	week
1	Observations, data corrections and reductions. (Theodolite Applications)	1-3
2	Reduction of observations to the ellipsoid and Reduction from the ellipsoid to the projection plane	4-7
3	Total Station Measurement and Analysis of observations. (Total Station Applications)	8-11
4	Network adjustment and Analysis of adjustment.	12,14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom
4	Practical

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Practical	A7.1 , B1.1 , B1.2 , B3.1 , B3.2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Practical	14

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Practical	100 %
Total		100 %

8. List of References

No.	Reference List
1	***A., Raymond, S. and Baker, R., "Surveying", 7th edition, Addison Wesley Longman, 2005***
2	***Bannister, A., Raymond, S. and Baker R., "Surveying", 7th edition, Addison Wesley Longman Limited, England, 2010.***

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board

3	Data Show System
4	Visualizer
5	Presenter
6	Sound System Practical
7	Lab facilities

]10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Observations, data corrections and reductions. (Theodolite Applications)	4	**A7.1 , B1.1**
2	Reduction of observations to the ellipsoid and Reduction from the ellipsoid to the projection plane	4	**B1.2**
3	Total Station Measurement and Analysis of observations. (Total Station Applications)	4	**A7.1 , B3.1**
4	Network adjustment and Analysis of adjustment.	4	**B3.2**

Course Coordinator:

1. Mahmoud El Mowafy Ebrahim Shitewy
2. محمد السعيد السيد محمود زهران

Head of Department: Prof. Dr. Muharram Fouad Abdo Allaa El Din

Date of Approval: December 2021

Course : Topographic surveying and geodesy	
Program LOs	**Course LOs**
A7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams	**A7.1** Function efficiently as an individual and as a member of a team in theodolite and total Station field work applications .
B1. Select appropriate and sustainable technologies for construction of buildings and infrastructures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics	**B1.1**- Apply a full range of Geodesy concepts and techniques in Observations, data corrections and reductions **B1.2**- Apply numerical techniques for Reduction of observations to the projection plane .
B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects..	**B3.1** Manage construction processes by Total Station Measurement of observations. **B3.2** Plan Network adjustment and Analysis of adjustment.

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department + Hydraulics Engineering Department.
Department Responsible for the Course	Structural Engineering Department
Course Code	STE 8213
Year/ Level	Second year
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	4	4	-

2. Course aims:

No.	Aim
4	Accommodate contemporary civil engineering material which is concrete and engage in self- and lifelong learning

3. Learning Outcomes (LOs):

B1.1.	select appropriate concrete mixture for construction of building and infrastructure
B1.2.	use physical measurements and testing in the engineering concepts of properties of concrete
B2.1.	using the properties and strength of concrete in design
B2.2.	Achieve the optimum design of reinforced concrete structures, foundations and earth retaining structures, also of road and airports sanitary works, irrigation, water resources and harbors
B3.1	ensure the quality of civil engineering constructions

4. Course Contents:

No.	Topics	week
1	Introduction of concrete types and materials	1
2	Concrete technology	2,3
3	Fresh Concrete properties and tests	4,5
4	destructive and non-destructive tests of hardened concrete	6,7
5	Concrete additives	9
6	Concrete Mix design	10,11
7	Special concrete	12,13
8	Quality control	14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom
4	Practical

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	Los
1	Mid Term Examination	B1.1, B1.2, B2.1,
2	Semester work (Quizzes, presentation, Portfolio)	B1.1, B1.2, B2.1, B3.1
3	Final Term Examination	B1.1, B1.2, B2.1, B3.1
4	Practical Examination	B2.2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	8
2	Semester work (Quizzes, presentation, Portfolio)	Weekly
3	Practical Examination	14
4	Final Term Examination	15

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	10%
2	Semester work (Quizzes, presentation, Portfolio)	10%
3	Final Term Examination	65%
4	Practical Examination	15%
Total		100 %

8. List of References

No.	Reference List
1	*Neville, A.M., "Properties of Concrete", Longman, 5th ed., 2010*

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	Aim	LO's
1	Introduction of concrete types and materials	4	B1.1, B1.2, B3.1
2	Concrete technology	4	B1.1, B1.2, B2.1, B2.2
3	Fresh Concrete properties and tests	4	B2.1, B2.2
4	destructive and non-destructive tests of hardened	4	B1.1, B3.1
5	Concrete additives	4	B3.1
6	Concrete Mix design	4	B1.1, B1.2, B3.1
7	Special concrete	4	B1.1, B1.2, B3.1
8	Quality control	4	B1.2, B3.1

Course Coordinator: Prof. Dr. Mohammed Yousry El-Sheikh

Head of Department: Prof. Dr. Mohamed El Zoughiby

Date of Approval: December 2021

Course: Strength of Materials 2	
Program Los	**Course Los**
B1. Select appropriate and sustainable technologies for construction of buildings and infrastructures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	B1.1. select appropriate concrete mixture for construction of building and infrastructure B1.2. use physical measurements and testing in the engineering concepts of properties of concrete
B2. 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.	B2.1. use the properties and strength of concrete in design B2.2. Achieve the optimum design of reinforced concrete structures, foundations and earth retaining structures, also of road and airports sanitary works, irrigation, water resources and harbors
B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.	B3.1 ensure the quality of civil engineering constructions

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department + Hydraulics Engineering Department.
Department Responsible for the Course	Structure Engineering Department
Course Code	STE 8215
Year/ Level	Second year
Specialization	Minor
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2		

2. Course aims:

No.	Aim
5	Managing and supervising construction projects with engineering team through professional and ethical responsibilities using the principles of Entrepreneurship and Marketing.

3. Learning Outcomes (LOs):

A7.1.	Doing work effectively with a team in construction projects using principles of entrepreneurship and marketing
A7.2	Work with different cultures and different jobs in construction projects with assessment of performance, responsibility and professional ethics in engineering fields.
A8.1	Making effective communication with different people before construction and make relationship with customer and promoting the culture of free labor
A8.2	Making business plans from different sources using graphical, verbale and written information Skills and perfect communication with others in engineering projects

4. Course Contents:

No.	Topics	week
1	The Emergence of Engineering Relationships and Aim to understand and identify	1,2
2	Parties to Engineering Work and Organization of Relationships between them.	3,4
3	Attributes and Values in Engineering Work.	5,6
4	Regulations and Ethics of the Practice of Engineering.	7
5	Rules and Ethics of Practicing Engineering Professions.	9,10
6	Areas of the Practice of Engineering.	11,12
7	Duties of the engineering union members and Divisions.	13,14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
3	Final Term Examination	A7.1 A7.1 A8.2

7.2 Assessment Schedule:2

No.	Assessment Method	Weeks
3	Final Term Examination	15

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
3	Final Term Examination	100%
Total		100 %

8. List of References

No.	Reference List
1	كتب نقابة المهندسين الخاصة بمزاولة المهنة

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	The Emergence of Engineering Relationships and Aim to understand and identify the Concepts of Engineering Work.	5	A7.1
2	Parties to Engineering Work and Organization of Relationships between them.	5	A7.1 A7.2
3	Attributes and Values in Engineering Work.	5	A8.1
4	Regulations and Ethics of the Practice of Engineering.	5	A8.2
5	Rules and Ethics of Practicing Engineering Professions.	5	A7.2
6	Areas of the Practice of Engineering.	5	A8.1 A8.2
7	Duties of the engineering union members and Divisions.	5	A8.1

Course Coordinator: Prof. Dr. Mohammed Yousry El-Sheikh

Head of Department: Prof. Dr. Mohamed El-Zoughiby

Date of Approval: December 2021

Course: Engineering Behaviors	
Program LOs	**Course Los**
A7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams .	A7.1. Doing work effectively with a team in construction projects using principles of entrepreneurship and marketing A7.2 Work with different cultures and different jobs in construction projects with assessment of performance, responsibility and professional ethics in engineering fields.
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools .	A8.1. Making effective communication with different people before construction and make relationship with customer and promoting the culture of free labor A8.2. Making business plans from different sources using graphical, verbale and written information Skills and perfect communication with others in engineering projects

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department + Hydraulics Engineering Department.
Department Responsible for the Course	Structural Engineering Department
Course Code	STE 8216
Year/ Level	Second year - First Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	2	-

2. Course aims:

No.	Aim
1	Master a wide range of fundamentals of theory of structures for solving the problems of elastic deformations of structures and statically indeterminate structures.

3. Learning Outcomes (LOs):

B1.1	Select appropriate mathematical methods for analysis of elastic deformations of structures and statically indeterminate structures.
B1.2	Apply the concepts of structural analysis for elastic deformations of structures and statically indeterminate structures.
B2.1	Achieve an optimum design by analysis statically indeterminate structures and of elastic deformations of structures.
B2.2	Apply the basic principles of analysis statically indeterminate structures by 3 moments equation and method of consistent deformations.

4. Course Contents:

No.	Topics	week
1	Properties of plane areas	1,2
2	Straining actions	3
3	Normal stresses	4,5,6
4	shear stresses	7,9,10
5	torsion stresses	11,12
6	combined and principal stresses	13,14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B1.1, B1.2
2	Semester work (Quizzes, presentation, Portfolio)	B1.1
3	Oral Examination	B1.2, B2.2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	8
2	Semester work (Quizzes, presentation, Portfolio)	weekly
3	Oral Examination	14

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	50%
2	Semester work (Quizzes, presentation, Portfolio)	25%
3	Oral Examination	25 %
Total		100 %

8. List of References

No.	Reference List
1	***Kelly, Pa. "Solid Mechanics Part I: An Introduction to Solid Mechanics". http://homepages.engineering.auckland.ac.nz/~pkel015/SolidMechanicsBooks/Part_I/.***
2	***EL-Dakhakhny. W. Theory of structures, fourteenth edition. Assiut University., Egypt.2010.***

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Properties of plane areas	1	B1.1, B1.2
2	Straining actions	1	B1.1, B1.2
3	Normal stresses	1	B1.2, B2.1
4	shear stresses	1	B2.1, B2.2
5	torsion stresses		B2.1, B2.2
6	combined and principal stresses		B2.1, B2.2

Course Coordinator: Assistant Prof. Dr/ Mohamed El Tantawy El Maadawy Awad

Head of Department: Prof. Dr. Mohamed El-Zoughiby

Date of Approval: December 2021

Course:Theory of structures 2*	
Program LOs	**Course LOs**
B1. Select appropriate and sustainable technologies for construction of buildings and infrastructures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics	B1.1- Select appropriate mathematical methods and solutions for analysis of normal, shear and torsion stresses on different types of structures.. B1.2- Apply the concepts of structural analysis for different types of straining actions and stresses.
B2. 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	B2.1- Achieve an optimum design of different types of connections by understanding design principles of different types of straining actions and B2.2- Apply analytical thinking to reach the most appropriate solution to engineering problems by analyze the different stresses on the structures

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department +Irrigation and Hydraulics Engineering Department
Department Responsible for the Course	Public Work Engineering Department
Course Code	PWE8222
Year/ Level	Second Year – Second Semester
Specialization	Major
Authorization data of course specification	December

Teaching Hours	Lectures	Tutorial	Practical
	2	2	0

2. Course aims:

No.	Aim
2	Apply knowledge of Geology and Soil Mechanics in solving dams, buildings and tunnels problems

3. Learning Outcomes (LOs):

B2.1	Achieve an optimum design of Foundations, tunnels, excavations and Earth Retaining Structures.
B2.2	Achieve an optimum solution of geological maps, Dams and tunnels
B3.1	Plan techniques and strategies for Permeability of Soil problems
B3.2	Manage calculation processes of Settlement of building by Geotechnical Fundamentals
B3.3	Manage Ground Water problems considering balanced costs, benefits, safety, and reliability

4. Course Contents:

No.	Topics	week
1	Introduction to Soil Mechanics : Soil Origin and Characteristics of Soil deposits; Soil Types and Soil Structure	1
2	Soil Composition: Terminology and Volumetric and Weight Definitions and Relations	2
3	Soil grading and Index properties and Classification tests.	2
4	Soil Moisture and Pressure in Soil Mass	3
5	Soil Classification systems	3
6	Permeability of Soil	4
7	Settlement: Soil volume change and consolidation	5

8	Shear strength theory	6
9	Introduction on Geology and Earth Origin	7
10	Minerals	7
11	Rocks and its compostion	9
12	Ground Water	10
13	Structure Features	11
14	Geophysical Survey	12
15	Geological Maps	13
16	Engineering Applications	14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B2.1 B2.2
2	Oral Examination	B3.1
3	Practical Examination	B3.2
4	Semester work (quizzes)	B2.2 , B3.1
5	Final Term Examination	B2.1 B2.2 B3.1 B3.2 B3.3

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	8
2	Oral Examination	14
3	Practical Examination	14
4	Semester work (quizzes)	weekly
5	Final Term Examination	15

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	10 %
2	Oral Examination	5 %
3	Practical Examination	5 %
4	Semester work (quizzes)	10 %
5	Final Term Examination	70 %
Total		100 %

8. List of References

No.	Reference List
1	***Braja Das, "Principles of Geotechnical Engineering", 2010.***
2	***Mayne, P. W., and Campanella, R. G. (2005). on Soil Mechanics and Geotechnical Engineering, International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), London, 2, 721–724.***

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Introduction to Soil Mechanics : Soil Origin and Characteristics of Soil deposits; Soil Types and Soil Structure	2	B2.1 B2.2
2	Soil Composition: Terminology and Volumetric and Weight Definitions and Relations	2	B2.1B2.2
3	Soil grading and Index properties and Classification tests.	2	B2.1 B2.2
4	Soil Moisture and Pressure in Soil Mass	2	B2.2
5	Soil Classification systems	2	B2.2
6	Permeability of Soil	2	B3.1 B3.2 B3.3

7	Settlement: Soil volume change and consolidation	2	B2.2 B3.1
8	Shear strength theory	2	B2.1 B3.1 B3.2
9	Introduction on Geology and Earth Origin	2	B2.2
10	Minerals	2	B2.2 , B3.3
11	Rocks and its compostion	2	B2.2 , B3.3
12	Ground Water	2	B3.1 B3.2 B3.3
13	Structure Features	2	B2.2 , B3.3
14	Geophysical Survey	2	B2.2 , B3.3
15	Geological Maps	2	B2.2 , B3.3
16	Engineering Applications	2	B3.1 ,B3.2 ,B3.3

Course Coordinator:

1. Magdy Abd El Halim Mohamed Zayed 

2. Murad Henry Zaki Ebrahim 

Head of Department: Prof. Dr. Muharram Fouad Abdo Allaa El Din

Date of Approval: December 2021

Course: Geology and Soil Mechanics	
Program LOs	Course LOs
B2. 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.	B2.1 Achieve an optimum design of Foundations, tunnels, excavations and Earth Retaining Structures. B2.2 Achieve an optimum solution of geological maps, Dams and tunnels
B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.	B3.1 Plan techniques and strategies for Permeability of Soil problems B3.2 Manage calculation processes of Settlement of building by Geotechnical Fundamentals B3.3 Manage Ground Water problems considering balanced costs, benefits, safety, and reliability

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department +Irrigation and Hydraulics Engineering Department
Department Responsible for the Course	Public Work Engineering department
Course Code	PWE 8225
Year/ Level	Second Year – Second Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	1	-

2. Course aims:

No.	Aim
5	Lead and communicate the project stakeholders effectively with full planning and scheduling for construction projects; and analyze its cash flow with resource and risk management.

3. Learning Outcomes (LOs):

B3.1	Communicate effectively with Project Stakeholders and display professional and ethical responsibilities during Procurement stage.
B3.2	Define PERT method and Networks for Project Scheduling.
B4.1	Deal with Tender types and Tender preparation for construction projects.
B4.2	Treat with Cash Flow analysis thinking and Project controlling.

4. Course Contents:

No.	Topics	week
1	Introduction and basic fundamentals	1 - 2
2	Selection of construction equipment	3 -4
3	Equipment and methods of moving earth	5 - 7
4	Excavation equipment and cranes	9
5	Design of concrete structures formworks	10
6	Methods of buildings and bridges construction	11
7	Soil compaction and foundation injection	12
8	Surveying works for construction projects	13 - 14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B3.1, B3.2
2	Semester work (Quizzes)	B3.2, B4.1
3	Final Term Examination	B3.2, B4.1, B4.2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	8
2	Semester work (Quizzes)	weekly
3	Final Term Examination	15

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	10 %
2	Semester work (Quizzes)	10 %
3	Final Term Examination	80 %
Total		100 %

8. List of References

No.	Reference List
1	***Hegazy, T., "Computer-Based Construction Project Management", 2002.***

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Introduction and basic fundamentals	5	B4.1
2	Selection of construction equipment	5	B3.2
3	Equipment and methods of moving earth	5	B3.2
4	Excavation equipment and cranes	5	B4.1
5	Design of concrete structures formworks	5	B4.1
6	Methods of buildings and bridges construction	5	B3.1
7	Soil compaction and foundation injection	5	B2.1, B2.2
8	Surveying works for construction projects	5	B3.1, B4.1, B4.2

Course Coordinator:

Sherief Masoud Ahmed El Badwy

Ahmed Mohamed Metwally Awad

Hani Mahanna Shehata El Said

Head of Department: Prof. Dr. Muharram Fouad Abdo Allaa El Din

Date of Approval: December 2021

Course: Construction project management	
Program LOs	**Course LOs**
B3. Lead and communicate effectively with multidisciplinary teams and display professional and ethical responsibilities; and contextual understanding to Manage and supervise construction project.	B3.1- Communicate effectively with Project Stakeholders and display professional and ethical responsibilities during Procurement stage. B3.2- Define PERT method and Networks for Project Scheduling.
B4. Deal with biddings, contracts and financial issues including project insurance and guarantees	B4.1- Deal with Tender types and Tender preparation for construction projects B4.2- Treat with Cash Flow analysis thinking and Project controlling.

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department +Irrigation and Hydraulics Engineering Department
Department Responsible for the Course	Public Works Department
Course Code	PWE8227
Year/ Level	Second Year-Second Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	1	1

2. Course aims:

No.	Aim
1	Master a wide range of Topographic Surveying & Geodesy techniques to use them in civil engineering projects

3. Learning Outcomes (LOs):

A7.1	Function efficiently as an individual and as a member of horizontal and vertical curves field work .
B1.1	Select appropriate technologies for construction of horizontal and Vertical Curves
B1.2	Apply Shape of Earth Surface, , Geoid, Reference Ellipsoid and Spheroid, Coordinate Systems, Datum Concepts and techniques
B3.1	Manage Traverse Network adjustment as application of Theory of errors
B3.2	Plan construction sites layout as application of photogrammetry surveying .

4. Course Contents:

No.	Topics	week
1	Route Surveying: Horizontal and Vertical Curves. (Total Station and Theodolite Applications	1-3
2	Shape of Earth Surface, Historic Development, Geoid, Reference Ellipsoid and Spheroid, Coordinate Systems, Datum.	4-5
3	Traverse Network adjustment and Analysis of adjustment.	6-7
4	Theory of errors	9-11
5	Principle of photogrammetry	13-14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom
4	Practical

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B1.2 , B3.1
2	Oral Examination	B3.1
3	Practical Examination	B1.1 , A7.1
4	Semester work (quizzes)	B1.2
5	Final Term Examination	B1.2 , B3.1 , B3.2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	8
2	Oral Examination	14
3	Practical Examination	14
4	Semester work (quizzes)	weekly
5	Final Term Examination	14

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	5%
2	Oral Examination	10 %
3	Practical Examination	7.7 %
4	Semester work (quizzes)	12.6 %
5	Final Term Examination	64.7%
Total		100 %

8. List of References

No.	Reference List
1	***A., Raymond, S. and Baker, R., "Surveying", 7th edition, Addison Wesley Longman, 2005***
2	***Bannister, A., Raymond, S. and Baker R., "Surveying", 7th edition, Addison Wesley Longman Limited, England, 2010.***

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System Practical
7	Lab facilities

]10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Route Surveying: Horizontal and Vertical Curves. (Total Station and Theodolite Applications	4	**A7.1 , B1.1**
2	Shape of Earth Surface, Historic Development, Geoid, Reference Ellipsoid and Spheroid, Coordinate Systems, Datum.	4	**B1.2**
3	Traverse Network adjustment and Analysis of adjustment.	4	**B3.1**
4	Theory of errors	4	**B3.1**
5	Principle of photogrammetry	4	**B3.1 , B3.2**

Course Coordinator:

1. Mahmoud El Mowafy Ebrahim Shitewy
2. محمد السعيد السيد محمود زهران

Head of Department: Prof. Dr. Muharram Fouad Abdo Allaa El Din

Date of Approval: December 2021

Course : Topography & Geodesy *	
Program LOs	**Course LOs**
A7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams	A7.1 Function efficiently as an individual and as a member of horizontal and vertical curves field work .
B1. Select appropriate and sustainable technologies for construction of buildings and infrastructures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics	**B1.1**- Select appropriate technologies for construction of horizontal and Vertical Curves **B1.2**- Apply Shape of Earth Surface, , Geoid, Reference Ellipsoid and Spheroid, Coordinate Systems, Datum Concepts and techniques
B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects..	**B3.1** Manage Traverse Network adjustment as application of Theory of errors **B3.2** Plan construction sites layout as application of photogrammetry surveying .

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department + Hydraulics Engineering Department.
Department Responsible for the Course	Structural Engineering Department
Course Code	STE8223
Year/ Level	Second Year- Second Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	4	2	

2. Course aims:

No.	Aim
1	Master a wide range of design knowledge, techniques and analysis to use them in reinforced concrete elements.

3. Learning Outcomes (LOs):

B1.1	Applying Structural Analysis and Mechanics, Properties and Strength of Materials.
B1.2	Applying a full range of design philosophy and methods of design.
B2.1	Achieve an optimum design of reinforced concrete sections subjected to bending moment and shear stresses.
B2.2	Achieve an optimum design of reinforced concrete beams, solid slabs, walls, columns and sections subjected to moment and axial loads.

4. Course Contents:

No.	Topics	week
1	Introduction and Reinforced Concrete Materials	w1
2	Design Philosophy, Methods and Procedures	w2
3	Design for Flexure	w3
4	Design for Bond	w4
5	Design for Shear	w5
6	Design of One-Way Solid Slabs	w6
7	Design of Two-Way Solid Slabs	w7
8	Design of Reinforced Concrete Beams	w9
9	Columns: Sections subjected to Axial Loads and Bending Moments	w10
10	Design of Reinforced Concrete Walls	w11
11	Working Stress Design Method (Elastic method)	w12,w13
12	General Review of the Course	w14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B2.1
2	Semester work	B2.2
3	Final Term Examination	B1.1, B1.2, B2.1, B2.2

7.2 Assessment Schedule:

No	Method	Week
1	Mid Term Examination	week(8)
2	Semester work	weekly
3	Final Term Examination	week(15)

7.3 Weighting of Assessments:

No	Method	Weight
1	Mid_term examination	13%
2	Semester work	20%
3	Final_term examination	67%
Total		100%

8. List of References

No.	Reference List
1	Macgregor, J.G., "Reinforced Concrete Mechanics & Design", Prentice-Hall International Inc., New Jersey, USA, 2016.

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Introduction and Reinforced Concrete Materials	1	B1.1, B1.2
2	Design Philosophy, Methods and Procedures	1	B2.1
3	Design for Flexure	1	B2.1
4	Design for Bond	1	B2.1
5	Design for Shear	1	B2.2
6	Design of One-Way Solid Slabs	1	B2.2
7	Design of Two-Way Solid Slabs	1	B2.2
8	Design of Reinforced Concrete Beams	1	B2.2
9	Columns: Sections subjected to Axial Loads and Bending Moments	1	B2.2
10	Design of Reinforced Concrete Walls	1	B2.2
11	Working Stress Design Method (Elastic method)	1	B2.2
12	General Review of the Course	1	B2.2

Course Coordinator: Prof. Dr. Ahmed Mahmoud Yousef

Head of Department: Prof. Dr. Mohamed El-Zoughiby

Date of Approval: December 2021

Course: Concrete-1	
Program LOs	**Course LOs**
B1. Select appropriate and sustainable technologies for construction of buildings and infrastructures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	B1.1 Applying Structural Analysis and Mechanics, Properties and Strength of Materials. B1.2 Applying a full range of design philosophy and methods of design.
B2. 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.	B2.1 Achieve an optimum design of reinforced concrete sections subjected to bending moment and shear stresses. B2.2 Achieve an optimum design of reinforced concrete beams, solid slabs, walls, columns and sections subjected to moment and axial loads.

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department + Hydraulics Engineering Department.
Department Responsible for the Course	Structural Engineering Department
Course Code	STE 8226
Year/ Level	Second year - Second Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	2	-

2. Course aims:

No.	Aim
1	Master a wide range of fundamentals of theory of structures for solving the problems of elastic deformations of structures and statically indeterminate structures.

3. Learning Outcomes (LOs):

B1.1	Select appropriate mathematical methods for analysis of elastic deformations of structures and statically indeterminate structures.
B1.2	Apply the concepts of structural analysis for elastic deformations of structures and statically indeterminate structures.
B2.1	Achieve an optimum design by analysis statically indeterminate structures and of elastic deformations of structures.
B2.2	Apply the basic principles of analysis statically indeterminate structures by 3 moments equation and method of consistent deformations.

4. Course Contents:

No.	Topics	week
1	Elastic deformations of structures	1-2-3-4-5
2	Statically indeterminate structures by Method of Consistent Deformations	6-7-9-10
3	Statically indeterminate structures by 3 moments equation	11-12
4	Effect of Temperature & Forced Displacements	13-14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B1.1, B1.2
2	Semester work (Quizzes, presentation, Portfolio)	B1.1
3	Final Term Examination	B1.1, B1.2, B2.1, B2.2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	8
2	Semester work (Quizzes, presentation, Portfolio)	weekly
3	Final Term Examination	15

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	12.5%
2	Semester work (Quizzes, presentation, Portfolio)	12.5%
3	Final Term Examination	75 %
Total		100 %

8. List of References

No.	Reference List
1	***Hibbeler, R. C. Structural Analysis, Eighth Edition. Pearson prentice Hall. New Jersey. USA.2015***
2	***EL-Dakhakhny. W. Theory of structures, fourteenth edition. Assiut University., Egypt.2010.***

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Elastic deformations of structures	1	B1.1, B1.2
2	Statically indeterminate structures by Method of Consistent Deformations	1	B1.1, B1.2
3	Statically indeterminate structures by 3 moments equation	1	B1.2, B2.1
4	Effect of Temperature & Forced Displacements	1	B2.1, B2.2

Course Coordinator: Assistant Prof. Dr/ Mohamed El Tantawy El Maadawy Awad

Head of Department: Prof. Dr. Mohamed El-Zoughiby

Date of Approval: December 2021

Course: Theory of structures 3	
Program LOs	**Course LOs**
B1. Select appropriate and sustainable technologies for construction of buildings and infrastructures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics	B1.1- Select appropriate mathematical methods for analysis of elastic deformations of structures and statically indeterminate structures. B1.2- Apply the concepts of structural analysis for elastic deformations of structures and statically indeterminate structures.
B2. 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	B2.1- Achieve an optimum design by analysis statically indeterminate structures and of elastic deformations of structures. B2.2- Apply the basic principles of analysis statically indeterminate structures by 3 moments equation and method of consistent deformations.

University: Mansoura University
Faculty: Faculty of Engineering
Program: Civil Engineering Program

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department +Irrigation and Hydraulics Engineering Department
Department Responsible for the Course	Architectural Engineering department
Course Code	ARE8221
Year/ Level	Second Year-Second Semester
Specialization	Minor
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	2	0

2. Course aims:

No.	Aim
3	Design architectural system , components and processes to meet the required needs with considering the impacts on society and environment .

3. Learning Outcomes (LOs):

B2.1	Design different masonry , raw bricks and brick masonry Construction building
B2.2	Achieve an optimum design for roofs, floors, ceilings , Walls and partitions of masonry - raw bricks & brick masonry .
B2.3	Design masonry - raw bricks & brick masonry building insulation against dampness, rain drainage .
B3.1	Manage skeleton building type Construction processes and its construction components , Mortars arid finishing materials .
B3.2	Plan technical sanitary installations drawings work of simplified buildings

4. Course Contents:

No.	Topics	week
1	Traditional construction - masonry - raw bricks & brick masonry	1 - 2
2	Construction building types & techniques: the wall bearing type	3 - 4
3	Construction of roofs, floors, and ceilings	5 - 6
4	Main construction elements, Walls and partitions, masonry - raw bricks & brick masonry	7
5	Building insulation against dampness, rain drainage	9 - 10
6	Construction building types & techniques: the skeleton type and its construction components	11
7	Mortars arid finishing materials	12

8	Applications and working drawings of simplified buildings	13
9	Introduction to technical sanitary installations.	14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B2.2 , B2.3
2	Semester work (Quizzes)	B2.1
3	Final Term Examination	B2.1 , B2.2 B2.3 , B3.1 , B3.2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	8
2	Semester work (Quizzes)	Weekly
3	Final Term Examination	15

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	15 %
2	Semester work (Quizzes)	70 %
3	Final Term Examination	15 %
Total		100 %

8. List of References

No.	Reference List
1	Establishment of Buildings - Building Technology – Engineer. Mohammad Abdullahin Arabic, 2011
2	Architectural details - Engineer / Mohammad Abdullah,in Arabic, 2011 .

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Traditional construction - masonry - raw bricks & brick masonry	3	B2.1
2	Construction building types & techniques: the wall bearing type	3	B2.1
3	Construction of roofs, floors, and ceilings	3	B2.2
4	Main construction elements, Walls and partitions, masonry - raw bricks & brick masonry	3	B2.1 , B2.2
5	Building insulation against dampness, rain drainage	3	B2.2 , B2.3
6	Construction building types & techniques: the skeleton type and its construction components	3	B3.1
7	Mortars arid finishing materials	3	B3.1
8	Applications and working drawings of simplified buildings	3	B3.2
	Introduction to technical sanitary installations.	3	B3.2

Course Coordinator:

Prof. Ahmed El-Tantawy El-Maadawy

Head of Department: Prof. Ahmed El-Tantawy El-Maadawy

Date of Approval: December 2021

Course: Building system	
Program LOs	**Course LOs**
B2. 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	B2.1 Design different masonry , raw bricks and brick masonry Construction building . B2.2 Achieve an optimum design for roofs, floors, ceilings , Walls and partitions of masonry - raw bricks & brick masonry B2.3 Design masonry - raw bricks & brick masonry building insulation against dampness, rain drainage
B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.	B3.1 Manage skeleton building type Construction processes and its construction components , Mortars arid finishing materials . B3.2 Plan technical sanitary installations drawings work of simplified buildings .

1. Basic Information

Program Title	Civil Engineering Program
Department offering the Program	Structural Engineering Department + Public Works Engineering Department + Hydraulics Engineering Department.
Department Responsible for the Course	Irrigation and Hydraulics Engineering
Course Name	Hydrology
Course Code	IRH8224
Year/ Level	Second Year-Second Semester
Specialization	Major
Authorization date of course specification	12/2021

Teaching Hours	Lectures	Tutorial	Practical
	2	1	0

2. Course aims:

No.	Aim
1	Master a wide range of Hydrological knowledge, techniques and skills to use them to solve Hydrology problems.

3. Learning Outcomes (LOs):

No.	LOs
B1.1	Apply a full range of hydrologic cycle to analyze hydrologic processes and calculate Hydrological losses.
B1.2	Select sustainable technologies to guide and remediate hydrograph and Regulating equations of surface flow.
B3.1	Plan the simulation of hydrological phenomena, ground water hydrology and storage in rivers.
B3.2	Manage interference of saline water in coastal areas and applications in both surface and groundwater flows.

4. Course Contents:

No.	Topics	week
1	Hydrologic cycle	W1
2	Precipitation	W2, W3
3	Hydrologic losses	W4, W5
4	Hydrographs	W6, W7, W9
5	Flood routing	W10, W11
6	groundwater hydrology	W12, W13
7	Saltwater intrusion in coastal aquifers	W14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

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

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	B1.1, B1.2
2	Semester work (Quizzes, presentation, Portfolio)	B3.1
3	Oral Examination	B1.1, B3.1
4	Final Term Examination	B1.1, B1.2, B3.1, B3.2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	**8**
2	Semester work (Quizzes, presentation, Portfolio)	**weekly**
3	Oral Examination	**14**
4	Final Term Examination	**15**

7.3 Weighting of Assessment:

No.	Assessment Method	Weights
1	Mid Term Examination	10 %
2	Semester work (Quizzes, presentation, Portfolio)	10 %
4	Oral Examination	10 %
6	Final Term Examination	70 %
Total		100%

8. List of References

No.	Reference List

1	Elsalmian, S. "Handbook of Engineering Hydrology: Environmental Hydrology and Water Management (1st Ed.)". ISBN: 9781466552494, CRC Press, 2014.
2	Warren Viessman, Jr. and Gary L. Lewis. "Introduction to Hydrology (5th International Edition)". ISBN-13: 978-0132763608, Pearson Education, 2011.

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	Aims	LO's
1	Hydrologic cycle	1	B1.1
2	Precipitation	1	B1.1
3	Hydrologic losses	1	B1.1, B3.1
4	Hydrographs	1	B1.2, B3.1
5	Flood routing	1	B3.1
6	groundwater hydrology	1	B3.1
7	Saltwater intrusion in coastal aquifers	1	B3.2

Course Coordinator: Assoc. Prof. Dr. Hossam Abd-Elaziz

Head of Department: Assoc. Prof. Dr. Tharwat Eid Sarhan

Date of Approval: 12/2021

Course: Hydrology	
Program LOs	**Course LOs**
B1. Select appropriate and sustainable technologies for construction of buildings and infrastructures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	B1.1 Apply a full range of hydrologic cycle to analyze hydrologic processes and calculate Hydrological losses. B1.2 Select sustainable technologies to guide and remediate hydrograph and regulating equations of surface flow.
B3. Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of Projects.	B3.1 Plan the simulation of hydrological phenomena, ground water hydrology and storage in rivers. B3.2 Manage interference of saline water in coastal areas and applications in both surface and groundwater flows.