1. Basic Information

Program Title	Civil Engineering
Department offering the Program	Structural Engineering Department + Public Works Engineering Department +Irrigation and Hydraulics Engineering Department
Department Responsible for the Course	Irrigation and Hydraulics Engineering
Course Name	Hydraulic (II) - 1st term
Course Code	IRH8315
Year/ Level	Third Year-First Semester
Specialization	Major
Authorization dateof course specification	12/2021

Teaching Hours	Lectures	Tutorial	Practical
	3	1	1

2. Course aims:

No.	Aim
6	Design different types of open channels using new building materials.

3. Learning Outcomes (LOs):

No.	LOs
C1.1	Select appropriate and sustainable technologies for analysis and construction of open channels; using either numerical techniques or physical measurements; by applying a full range of civil engineering concepts and techniques of: soil mechanics and hydraulics.
C2.1	Achieve an optimum design of erodible and non-erodible open channels.

4. Course Contents:

No.	Topics	week
1	Gradually Varied Flow	W1
2	Design of Open Channels	W2, W3 , W4
3	River Hydraulics and Introduction to sediment transport	W5, W6, W7
4	Hydraulic Models	W8, W9, W 10 , W11
5	Hydraulic Machinery	W12, W 13 , W 14

5. Teaching and Learning Methods:

No.	Teaching Method
1	lectures
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	C1.1
2	Semester work (Quizzes, presentation, Portfolio)	C1.1- C2.1
3	Oral Examination	C1.1
4	Final Term Examination	C1.1- C2.1

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	Final Term Examination	**15**

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	**20 %**
2	Semester work (Quizzes, presentation, Portfolio)	**15 %**
3	Oral Examination	**15 %**
4	Final Term Examination	**60 %**
Total		100 %

8. List of References

No.	Reference List
1	Terry W. Sturm " Open Channel Hydraulics." 3rd ed. McGraw Hill, 2021.
2	Radecki-Pawlik, Artur, Stefano Pagliara, and Jan Hradecky, eds. "Open Channel Hydraulics, River Hydraulic Structures and Fluvial Geomorphology: For Engineers, Geomorphologists and Physical Geographers." CRC Press, 2018.
3	Glenn E. Moglen "Fundamentals of Open Channel Flow" CRC Press, 2015.
4	Houghtalen, R.J., Akan, A.O.H., & Hwang, N.H.C. "Fundamentals of Hydraulic Engineering Systems." 4th ed. Prentice Hall, 2011.

9. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Gradually Varied Flow	6	C1.1
2	Design of Open Channels	6	C1.1
3	River Hydraulics and Introduction to sediment transport	6	C1.1- C2.1
4	Hydraulic Models	6	C1.1
5	Hydraulic Machinary	6	C1.1

Course Coordinator: **Prof. Dr. Mohsen Mohamed Ezzeldin.**

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

Date of Approval: **12 / 2021.**

Course: Hydraulics (II) – 1st Term	
Program LOs	**Course LOs**
C1. Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and strength of Materials, Surveying, Soil Mechanics, Hydrology and Hydraulics.	C1.1 Select appropriate and sustainable technologies for analysis and construction of open channels; using either numerical techniques or physical measurements; by applying a full range of civil engineering concepts and techniques of: soil mechanics and hydraulics.
C2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures, Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Hydraulics, Water Resources and Harbors.	C2.1 Achieve an optimum design of erodible and non-erodible open channels.

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	PWE8314
Year/ Level	Third Year-First Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	2	0

2. Course aims:

No.	Aim
6	Design different types of projects in different disciplines including railroad engineering and public works engineering using new building materials.

3. Learning Outcomes (LOs):

C2.1	Achieve an optimum design of Railways.
C2.2	Achieve an optimum design of signaling systems of railway lines
C3.1	Plan alignment of railway line and transition curves.
C3.2	Manage process of selecting appropriate railway stations and platform dimension.

4. Course Contents:

No.	Topics	Week
1	Introduction and Definition	1
2	Running Stock Dynamics	2-3
3	Alignment of Rail Lines	4-5
4	Structure Design of Track Elements	6-7
5	Design of efficient and safe Railway Turnouts	9-10
	Planning of Rail Station	11-12
6	Signaling System of Railway Tracks	13
7	Introduction and Definition	1

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	C2.1, C2.2
2	Semester work (Quizzes)	C3.1, C3.2, C2.1
3	Final term examination	C2.1, C2.2, C3.1, C3.2

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	20%
2	Semester work	10%
3	Final term examination	70%
Total		100 %

8. List of References

No.	Reference List
1	Profillidis, V., “Railway Management and Engineering”. Routledge, 2016.
2	Chandra, S., & Agarwal, M.M., "Railway Engineering", 2 edition, 2013.

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 Definition	6	C2.1
2	Running Stock Dynamics	6	C3.1
3	Alignment of Rail Lines	6	C3.1
4	Structure Design of Track Elements	6	C2.1
5	Design of efficient and safe Railway Turnouts	6	C2.1, C3.1
	Planning of Rail Station	6	C2.1
6	Signaling System of Railway Tracks	6	C3.2
7	Introduction and Definition	6	C3.3

Course Coordinator:

1. El Sayed Ahmed Mohamed Shoaib

2. Sanaa Hassan Ateya Ebrahim

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

Date of Approval: December 2021

Course: Railway	
Program Los	**Course Los**
C2.Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures, Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Hydraulics, Water Resources and Harbors.	C2.1. Achieve an optimum design of Railways. C2.2. Achieve an optimum design of signaling systems of railway lines
C3.Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials.	C3.1. Plan alignment of railway line and transition curves. C3.2. Manage process of selecting appropriate railway stations and platform dimension.

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 8312		
Year/ Level	Third Year-First Semester		
Specialization	Major		
Authorization data of course	December 2021		
Teaching Hours	Lectures	Tutorial	Practical
	2	2	0

2. Course aims:

No.	aim
1	Master a wide range of engineering knowledge, quality control, specification and quantity of materials to use them in building construction.

3. Learning Outcomes (LOs):

A4.1	Utilize contemporary technologies to analysis and calculate quantities of construction materials.
A4.2	Utilize safety requirements, environmental issues, and risk management principles using technical specifications.
A5	Practice research techniques to develop tables of quantities and price categories.
A6	Monitor implementation of engineering projects, taking into consideration special documents and writing contracts.

4. Course Contents:

No.	Topics	Week
1	Electrical works – Piles work – elevator works – The work condition of contractor	1
2	tender forms – Writing the specifications	2
3	Elements of writing specifications – General specifications	3,4

4	Quantities determining science – Analysis of different item –	5,6

5	Schedule unit price for different items – Quantity surveying for different projects and use bill of quantities	8,9
6	Quantities and measurements for excavation and filling concrete works – bricks and block works	10, 12
7	Damp proof course – stairs – plaster – carpenter and joinery –	13, 14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybridlearning)
2	Discussion lessons
3	Flipped classroom

6. Teaching and Learning Methods 0f 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 (written)	A4.1, A4.2
2	Semester work (Formative - quizzes – presentation)	A4.2, A5
3	Final Term Examination (written)	A4.1, A4.2, A5, A6

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination (written)	8
2	Semester work (Formative - quizzes – presentation)	Weekly
3	Final Term Examination (written)	15

7.3 Weighting of Assessments:

No.	Assessment Method	Weights

1	Mid Term Examination (written)	15
2	Semester work (Formative - quizzes – presentation)	15
3	Final Term Examination (written)	70
Total		100%

8. List of References

No.	Reference List
1	Ken W. Day, James Aldred, Barry Hudson, “Concrete Mix Design, Quality Control and Specification ", 4th Edition, 2014.

9. Facilities Required for Teaching and Learning:

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

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Electrical works – Piles work – elevator works – The work condition of contractor	1	A4.1, A5
2	tender forms – Writing the specifications	1	A4.1, A5
3	Elements of writing specifications – General specifications	1	A5, A6
4	Quantities determining science – Analysis of different item –	1	A5, A6
5	Schedule unit price for different items – Quantity surveying for different projects and use bill of quantities	1	A4.1, A5, A6
6	Quantities and measurements for excavation and filling concrete works – bricks and block works	1	A4.1, A5, A6
7	Damp proof course – stairs – plaster – carpenter and joinery –	1	A6

Course Coordinator: Prof. Dr. Mohamed Elmahdy

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

Date of Approval: December 2021

Course: Specifications, Quantities & Specifications	
Program LOs	**Course LOs**
A.4. Utilize contemporary technologies, codes of practice, and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	A.4.1. Utilize contemporary technologies to analysis and calculate quantities of construction materials. A.4.2. Utilize safety requirements, environmental issues, and risk management principles using technical specifications.
A.5. Practice research techniques and methods of investigation as an inherent part of learning.	A.5. Practice research techniques to develop tables of quantities and price categories.
A.6. Plan, supervise, and monitor implementation of engineering projects, taking into consideration other trades requirements.	A.6. Monitor implementation of engineering projects, taking into consideration special documents and writing contracts.

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 8313
Year/ Level	Third year
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	2	-

2. Course aims:

No.	Aim
2	Apply the basic principles of theory of structures for analyzing statically indeterminate structures

3. Learning Outcomes (LOs):

B1.1	Select appropriate mathematical methods and solutions for analysis of statically indeterminate structures by using slope deflection, moment distribution and stiffness method.
B1.2	Apply the concepts of structural analysis for Buckling Analysis.
B2.1	Achieve an optimum design of different types of structural element by understanding Buckling Analysis and Stresses in prestressed concrete.
B2.2	Apply analytical thinking to reach the most appropriate solution to engineering problems by dynamic analysis for single degree of freedom system.

4. Course Contents:

No.	Topics	week
1	Slope deflection method	1,2,3
2	Moment distribution method	4,5,6
3	Stiffness method	7,9,10,11 ,12
4	Introduction of dynamic structures analysis	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, B1.2
3	Final Term Examination	B1.1, 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	20%
2	Semester work (Quizzes, presentation, Portfolio)	10%
3	Final Term Examination	70%
Total		100 %

8. List of References

No.	Reference List
1	***Mohamed Naguib ,“ Analysis of Structures by displacement methods”, 2010***
2	***Hibbeler, R. C. Structural Analysis, Eighth Edition. Pearson prentice Hall. New Jersey. USA.2012.***
3	***EL-Dakhakhny. W. Theory of structures, fourteenth edition. Assiut University.,***

	Egypt.2010.

9. Facilities Required for Teaching and Learning:

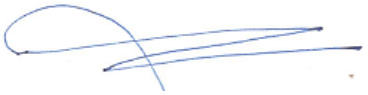
No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Slope deflection method	2	B1.1, B1.2
2	Moment distribution method	2	B1.1, B1.2
3	Stiffness method	2	B2.2, B1.2
4	Introduction of dynamic structures analysis	2	B2.2, B1.1

Course Coordinator: Prof. Dr/Mohamed Nagib Mohamed Abou El Saad

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



Date of Approval: December 2021

Course: Theory of structures 4	
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 statically indeterminate structures by using slope deflection, moment distribution and stiffness method. B1.2- Apply the concepts of structural analysis for Buckling Analysis.
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 structural element by understanding Buckling Analysis and Stresses in prestressed concrete. B2.2- Apply analytical thinking to reach the most appropriate solution to engineering problems by dynamic analysis for single degree of freedom system.

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 8316
Year/ Level	Third 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 design knowledge and techniques to use them in design of different reinforced concrete systems.

3. Learning Outcomes (LOs):

B1.1	Select appropriate system according to the given parameters.
B1.2	Applying Structural Analysis and Mechanics, Properties and Strength of Materials.
B2.1	Achieve an optimum design of different types reinforced concrete slabs, stairs and beams subjected to Torsional moment.

4. Course Contents:

No.	To	week
1	Ribbed and Hollow-Block slabs.	W1,W2,W3
2	Design of Grid floors / Paneled Beam systems.	W4,W5,W6
3	Analysis and Design for Torsion.	W7,W9
4	Flat slab systems: shear and moment analysis.	W10,W12
5	Reinforced concrete stairs.	W13,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)	B2.1, B2.2

7.2 Assessment Schedule:

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

7.3 Weighting of Assessments:

No	Method	Weight
1	Mid_term examination	50%
3	Semester work	50%
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.
2	El-behairy, S., "Reinforced Concrete Design Handbook", sixth edition, Cairo, 2019.

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	Ribbed and Hollow-Block slabs.	1	B1.1, B1.2
2	Design of Grid floors / Paneled Beam systems.	1	B2.1
3	Analysis and Design for Torsion.	1	B2.1
4	Flat slab systems: shear and moment analysis.	1	B2.1
5	Reinforced concrete stairs.	1	B2.1

Course Coordinator: Prof. Dr. Hamed Asker

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

Date of Approval: December 2021

Course: Concrete-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 system according to the given parameters. B1.2 Applying Structural Analysis and Mechanics, Properties and Strength of Materials.
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 reinforced concrete slabs, stairs and beams subjected to Torsional moment. B2.2 Achieve an optimum design of reinforced concrete Frames, Arches, Connections and saw tooth systems.

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 8317
Year/ Level	Third Year-First Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	2	0

2. Course aims:

No.	Aim
1	Master a wide range of steel structures engineering knowledge and techniques to use them in steel structures projects.

3. Learning Outcomes (LOs):

B2.1	Achieve an optimum design of Steel structures.
B3.1	Address Type of steel system used in Steel Structures projects and Types of loads.
B3.2	Plan Load Path through different structural elements.
B3.3	Assess Loads and straining actions on steel system.

4. Course Contents:

No.	Topics	week
1	Types of steel structures.	1
2	Types of loads on steel structural building.	2
3	Method of Design of steel structural buildings.(ASD - LRFD. Methods)	3
4	Allowable stress in different steel structural buildings.	4
5	Design of tension members, according to ASDM.	5,6
6	Design of Compression members, according ASDM.	7,9
7	Design of bolted connections in trusses	10
8	Design of welded connections in trusses	11,12
9	Design of columns under axial loads.	13
10	General review of the course	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 disabled 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, B3.1, B3.2
2	Semester work (Quizzes, presentation, Portfolio)	B2.1, B3.3

7.2 Assessment Schedule:

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

7.3 Weighting of Assessments:

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

8. List of References

No.	Reference List
1	*Egyptian Code of Practice for Steel Construction (Load and Resistance Factor Design (LRFD) (205) Ministerial Decree No. 359-2007, Ministry of Housing, Utilities and Urban Development.*
2	*Egyptian Code of Practice for Steel Construction and Bridges (ASD) Code No. ECP 205-2001, Edit 2009. Ministry of Housing, Utilities and Urban Development.*
3	*Alan Williams. "Steel Structures Design (ASD/LRFD)". USA: International Code Council, 2011.*

9. Facilities Required for Teaching and Learning:

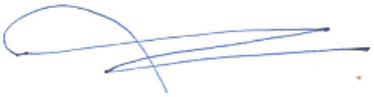
No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Types of steel structures.	1	B2.1
2	Types of loads on steel structural building.	1	B3.1
3	Method of Design of steel structural buildings.(ASD - LRFD. Methods)	1	B2.1, B3.1
4	Allowable stress in different steel structural buildings.	1	B2.1, B3.3
5	Design of tension members, according to ASDM.	1	B2.1, B3.2
6	Design of Compression members, according ASDM.	1	B2.1, B3.3
7	Design of bolted connections in trusses	1	B2.1, B3.2
8	Design of welded connections in trusses	1	B2.1
9	Design of columns under axial loads.	1	B2.1
10	General review of the course	1	B2.1, B3.2, B3.3

Course Coordinator:A. Prof. Dr. Fikry Abdo Salem

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



Date of Approval: December 2021

Course:Steel constructions 1*	
Program LOs	**Course LOs**
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.** Address Type of steel system used in Steel Structures projects and Types of loads. **B3.2.** Plan Load Path through different structural elements. **B3.3.** Assess Loads and straining actions on steel system.
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 Steel structures.

1. Basic Information

Program Title	Civil Engineering
Department offering the Program	Structural Engineering Department + Public Works Engineering Department +Irrigation and Hydraulics Engineering Department
Department Responsible for the Course	Irrigation and Hydraulics Engineering
Course Name	Design of Irrigation Works
Course Code	IRH8311
Year/ Level	Third Year-First Semester
Specialization	Major
Authorization data of course specification	12/2021

Teaching Hours	Lectures	Tutorial	Practical
	4	2	0

2. Course aims:

No.	Aim
1	Master a wide range of hydraulics, hydrology and structural engineering knowledge, techniques and skills to use them in water structures projects.

3. Learning Outcomes (LOs):

No.	LOs
B1.1	Apply a full range of civil engineering concepts and techniques of hydrology and hydraulics for solving water structures problems.
B1.2	Select appropriate and sustainable technologies for construction of irrigation and hydraulics structures.
B2.1	Achieve an optimum design for retaining walls, escapes and water crossing structures.

4. Course Contents:

No.	Topics	week
1	Introduction	W1
2	Retaining walls	W2, W3
3	Culverts	W4
4	Arch bridges	W5, W7
5	Reinforced concrete bridges	W9, W10
6	Rolled steel joist bridges	W11
7	Syphons	W12
8	Aqueducts	W13
9	Escapes	W14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Lectures
2	Discussion Sessions
3	Flipped classroom

6. Student Assessment:

6.1 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
3	Final Term Examination	B1.1, B1.2, B2.1

6.2 Assessment Schedule:

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

6.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	**20 %**
2	Semester work (Quizzes, presentation, Portfolio)	**13.33 %**
3	Final Term Examination	**66.66 %**
Total		100 %

7. List of References

No.	Reference List
1	Sharma, Er Dr S K., “Irrigation Engineering and Hydraulic Structures”, S. Chand Publishing, 2017.
2	Santosh Kumar Garg, “Irrigation Engineering and Hydraulic Structures: Water Resources Engineering, Vol. II”, Khanna Publishers Pvt. Ltd, 2016.
3	Sheng-Hong Chen " Hydraulic Structures. " Springer-Verlag Berlin Heidelberg, 2015.
4	Varshney Rs. "Theory And Design of Irrigation Structures Vol 2." ISBN: 978-8185240480, Nem Chand & B, 2007

8. 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

9. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Introduction	1	B1.1
2	Retaining walls	1	B1.1, B1.2, B2.1
3	Culverts	1	B1.1, B1.2
4	Arch bridges	1	B1.1, B1.2, B2.1
5	Reinforced concrete bridges	1	B1.1, B1.2
6	Rolled steel joist bridges	1	B1.1, B1.2, B2.1
7	Syphons	1	B1.1
8	Aqueducts	1	B1.1, B1.2, B2.1
9	Escapes	1	B1.1

Course Coordinator: **Assoc. Prof. Dr. Tharwat Eid Sarhan.**

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

Date of Approval: **12 /2021**

Course: Design of water structures 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	B1.1 Apply a full range of civil engineering concepts and techniques of hydrology and hydraulics for solving water structures problems. B1.2 Select appropriate and sustainable technologies for construction of irrigation and hydraulics structures.

Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	
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 retaining walls, escapes and water crossing structures.

1. Basic Information

Program Title	Civil Engineering
Department offering the Program	Structural Engineering Department + Public Works Engineering Department +Irrigation and Hydraulics Engineering Department
Department Responsible for the Course	Irrigation and Hydraulics Engineering
Course Name	**Hydraulic (II) - 2nd** term
Course Code	IRH8324
Year/ Level	Third Year-Second Semester
Specialization	Major
Authorization date of course specification	12/2021

Teaching Hours	Lectures	Tutorial	Practical
	3	1	1

2. Course aims:

No.	Aim
6	Design different types of open channels using new building materials.

3. Learning Outcomes (LOs):

No.	LOs
C1.1	Select appropriate and sustainable technologies for analysis and construction of open channels; using either numerical techniques or physical measurements; by applying a full range of civil engineering concepts and techniques of: soil mechanics and hydraulics.
C2.1	Achieve an optimum design of erodible and non-erodible open channels.

4. Course Contents:

No.	Topics	week
1	Gradually Varied Flow	W1
2	Design of Open Channels	W2, W3 , W5
3	River Hydraulics and Introduction to sediment transport	W5, W6, W7
4	Hydraulic Models	W8, W9, W 10 , W11
5	Hydraulic Machinary	W12, W 13 , W 14

5. Teaching and Learning Methods:

No.	Teaching Method
1	lectures
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	C1.1
2	Semester work (Quizzes, presentation, Portfolio)	C1.1- C2.1
3	Oral Examination	C1.1
4	Final Term Examination	C1.1- C2.1

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	Final Term Examination	**15**

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	**20 %**
2	Semester work (Quizzes, presentation, Portfolio)	**15 %**
3	Oral Examination	**15 %**
4	Final Term Examination	**50 %**
Total		100 %

8. List of References

No.	Reference List
1	Terry W. Sturm " Open Channel Hydraulics." 3rd ed. McGraw Hill, 2021.
2	Radecki-Pawlik, Artur, Stefano Pagliara, and Jan Hradecky, eds. "Open Channel Hydraulics, River Hydraulic Structures and Fluvial Geomorphology: For Engineers, Geomorphologists and Physical Geographers." CRC Press, 2018.
3	Glenn E. Moglen "Fundamentals of Open Channel Flow" CRC Press, 2015.
4	Houghtalen, R.J., Akan, A.O.H., & Hwang, N.H.C. "Fundamentals of Hydraulic Engineering Systems." 4th ed. Prentice Hall, 2011.

9. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Gradually Varied Flow	6	C1.1- C2.1
2	Design of Open Channels	6	C1.1
3	River Hydraulics and Introduction to sediment transport	6	C1.1- C2.1
4	Hydraulic Models	6	C1.1
5	Hydraulic Machinary	6	C1.1

Course Coordinator: **Prof. Dr. Mohsen Mohamed Ezzeldin.**

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

Date of Approval: **12 / 2021.**

Course: Hydraulics (II) – 2nd Term	
Program LOs	**Course LOs**
C1. Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and strength of Materials, Surveying, Soil Mechanics, Hydrology and Hydraulics.	C1.1 Select appropriate and sustainable technologies for analysis and construction of open channels; using either numerical techniques or physical measurements; by applying a full range of civil engineering concepts and techniques of: soil mechanics and hydraulics.
C2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures, Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Hydraulics, Water Resources and Harbors.	C2.1 Achieve an optimum design of erodible and non-erodible open channels.

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 8322
Year/ Level	Third Year-Second Semester:
Specialization	Major
Authorization data of course specification	

Teaching Hours	Lectures	Tutorial	Practical
	4	2	0

2. Course aims:

No.	Aim
3	Create the field of civil engineering in order to meet the necessary needs while taking into account the effects on society and environment.

3. Learning Outcomes (LOs):

B2.1	achieve an optimum design of the transportation and the socio-economic environment, components of transportation systems.
B2.2	evaluate the transportation impact studies and evaluation techniques of transportation projects.
B3.1	plane highway geometric elements.
B3.2	manage traffic flow, capacity analysis, and traffic safety analysis

4. Course Contents:

No.	Topics	week
1	Introduction to transportation engineering and urban areas planning	1
2	Phase I : Data Collection	2-3
3	Phase II : Transportation Models.	4
4	Phase III : Evaluation	5
5	Introduction to traffic engineering	6-7
6	Highway capacity.	9-11
7	Traffic flow count, speed and delay measurements	12
8	Parking surveys.	13
9	At grade intersection (design and control)	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	Semester work	B3.2
4	Final Term Examination	B2.1, B2.2, B3.1, B3.2

7.2 Assessment Schedule:

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

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	10 %
2	Oral Examination	10 %
3	Semester work	13 %
4	Final Term Examination	67 %
Total		100 %

8. List of References

No.	Reference List
1	Roess, R. P., E. S. Prassas, and W. R. McShane., "Traffic Engineering", Fourth Edition, International Edition, Pearson, 2011.
2	Ortuzar, J.D. and L.G. Willumsen., "Modelling Transport", Third Edition, Jon Wiley&Sons, Inc., 2011.
3	Papacostas, C.S. and Prevedouros, P.D., "Transportation Engineering and Planning", Third Edition, Pearson Canada, Toronto, 2000.

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 transportation engineering and urban areas planning	3	B2.1
2	Phase I : Data Collection	3	B2.1, B2.2
3	Phase II : Transportation Models.	3	B2.1
4	Phase III : Evaluation	3	B3.1
5	Introduction to traffic engineering	3	B3.1
6	Highway capacity.	3	B3.2
7	Traffic flow count, speed and delay measurements	3	B3.2
8	Parking surveys.	3	B3.2
9	At grade intersection (design and control)	3	B2.2, B3.2

Course Coordinator:

1. El Sayed Abd El Azim Mohamed El Shewally
2. Usama Elrawy Ali Shahdah
3. Sanya Riad El Agamy Foda

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

Date of Approval: December 2021

Course: Transport & Traffic	
Program LOs	**Course LOs**
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 plane highway geometric elements. B3.2 manage traffic flow, capacity analysis, and traffic safety analysis
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 the transportation and the socio-economic environment ,components of transportation systems. B2.2 evaluate the transportation impact studies and evaluation techniques of transportation 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 8321
Year/ Level	Third year – Second semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	4	4	-

2. Course aims:

No.	Aim
6	Design different types of shallow foundation types according to Egyptian code of soil mechanics and foundations .

3. Learning Outcomes (ILOs):

A10.1	Acquire new knowledge about shallow foundations
C1.1	Apply full range of soil properties, soil stresses, foundation settlement, lateral earth pressure and stability of slopes.
C1.2	Select appropriate soil bearing capacity for shallow foundations and foundation types.

4. Course Contents:

No.	Topics	week
1	Soil Mechanics	1,2
2	Foundation settlement	3,4
3	Bearing capacity and soil stability	5,6
4	Slopes and earth pressure	7,9
5	Shallow Foundation: isolated, strip, combined and raft	10,11
6	Slope stability	12,13,14

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	ILOs
1	Mid Term Examination	C1.1 – C1.2 – A10.1
2	Semester work (Quizzes, presentation, Portfolio)	C1.1 – C1.2 – A10.1
4	Oral examination	C1.1 – C1.2 – A10.1
5	Final Term Examination	C1.1 – C1.2 – A10.1

7.2 Assessment Schedule:

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

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	20%
2	Semester work (Quizzes, presentation, Portfolio)	10%
4	Oral examination	5%
5	Final Term Examination	65%
Total		100 %

8. List of References

No.	Reference List
1	Principles of Geotechnical Engineering, 8th SI edition- Braja M. Das & Khaled Sobhan- Cengage Learning (2013)
2	Craig's Soil Mechanics, 8th edition - J. A. Knappett & R. F. Craig – Spon Press (2012)

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
7	Soil mechanics and foundation lab

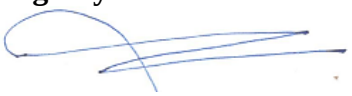
10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Soil Mechanics	6	C1.1 – C1.2 – A10.1
2	Foundation settlement	6	C1.1 – C1.2 – A10.1
3	Bearing capacity and soil stability	6	C1.1 – C1.2
4	Slopes and earth pressure	6	C1.1 – C1.2
5	Shallow Foundation: isolated, strip, combined and raft	6	C1.2
6	Slope stability	6	C1.2

Course Coordinator:

- Ass. Prof. Ayman Ibrahim El-tahrany 

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



Date of Approval: December 2021

Course: Soil mechanics and foundations 1	
Program LOs	**Course LOs**
A10: Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	A10.1: Acquire new knowledge about shallow foundations
C1: Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and strength of Materials, Surveying, Soil Mechanics, Hydrology and Hydraulics	C1.1. Apply full range of soil properties, soil stresses, foundation settlement,lateral earth pressure and stability of slopes. C1.2 Select appropriate Soil bearing capacity for shallow foundations and foundation types.

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 8323		
Year/ Level	Third year		
Specialization	Faculty requirement		
Authorization data of course specification			
Teaching hours	**Lectures**	**Tutorial**	**Practical**
	2	-	-

2. Course aims:

No.	aim
5	Lead and Communicate effectively with multidisciplinary teams within structural projects and display professional and ethical responsibilities; and contextual understanding to Manage and supervise construction project.

3. Learning Outcomes (LOs):

No.	LOs
A8.1	List the elements of writing strategy.
A8.2	Prepare the technical report according to elements of writing strategy.
A8.3	Write a technical report
A8.4	Identify the categories and structure of formal reports
A8.5	Use technical writing rules in writing: laboratory report, field report, periodic reports, proposal, theses and dissertations and CV
B4.1	Deal with contracts at the beginning of project.

4. Course Contents:

No	Topics	Week
1	the rule of preparing technical reports	1 , 2
2	the content of technical reports	3 , 4 , 5
3	analysis of experimental data	6 , 7
4	view of data	9 , 10
5	studies , testing and review	11 , 12 , 13 , 14

5. Teaching and Learning Methods:

No.	Teaching Method	LOs
1	Interactive lectures (hybridlearning)	
2	Flipped classroom	

6. Teaching and Learning Methods 0f Disable Students:

No.	Teaching Method	Reason
1	Non	

7. Student Assessment:

7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Semester work (reports, presentation, formative assessment)	A8.1, A8.2, A8.3, A8.4, A8.5
2	Final exam.	A8.2, A8.3, A8.4, A8.5, B4.1

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Semester work (reports, presentation, formative assessment)	Every 2 weeks
2	Final exam.	15

7.3 Weighting of Assessment:

No.	Assessment Method	Weights
1	Semester work (reports, presentation, formative assessment)	30

2	Final exam.	70
Total		100

8. List of References

No.	Reference List
1	*G. J. Alred, W. E. Oliu, The Handbook of Technical Writing, 12th Edition, Bedford/St. Martin's;*

	2018

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	Library
3	Internet
4	Data Show System
5	Visualizer
6	Presenter

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LOs
1	the rule of preparing technical reports	5	A8.1
2	the content of technical reports	5	A8.2
3	analysis of experimental data	5	A8.3
4	view of data	5	A8.4
5	studies , testing and review	5	A8.5, B4.1

Course Coordinator :

Prof. Dr. Ahmed Tahawia

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

Date of Approval: December 2021

Technical reports in Civil Engineering 2	
Program' LOs	**Course LOs**
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	A8.1 List the elements of writing strategy. A8.2 Prepare the technical report according to elements of writing strategy. A8.3 Write a technical report A8.4 Identify the categories and structure of formal reports A8.5 Use technical writing rules in writing: laboratory report, field report, periodic reports, proposal, theses and dissertations and CV
B4. Deal with biddings, contracts and financial issues including project insurance and guarantees.	B4.1: Deal with contracts at the beginning of project.

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 8325
Year/ Level	Third 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 design knowledge and techniques to use them in design of different reinforced concrete systems.

3. Learning Outcomes (LOs):

B1.1	Select appropriate system according to the given parameters.
B1.2	Applying Structural Analysis and Mechanics, Properties and Strength of Materials.
B2.1	Achieve an optimum design of different types reinforced concrete slabs, stairs and beams subjected to Torsional moment.
B2.2	Achieve an optimum design of reinforced concrete Frames, Arches, Connections and saw tooth systems.

4. Course Contents:

No.	Topics	week
1	Design of reinforced concrete halls using simple and continuous girders	w1 , w2
2	Design of Radial frames	w5 , w6
3	Design of different types of reinforced concrete hinged supports	w7
4	Design of different types of reinforced concrete Arches and Arched slabs	w9
5	Design of reinforced concrete halls using Vierendeel girders	w10
6	Design and analysis of saw-tooth reinforced concrete halls	w11
7	Structural systems for halls require natural North light	w12
8	General review of the course	w13 , 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	B2.1, 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	Final_term examination	67%
3	Semester work	20%
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.
2	El-behairy, S., "Reinforced Concrete Design Handbook", sixth edition, Cairo, 2019.

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	Design of reinforced concrete halls using simple and continuous girders	1	B1.2, B2.1
2	Design of Radial frames	1	B2.1
3	Design of different types of reinforced concrete hinged supports	1	B2.1
4	Design of different types of reinforced concrete Arches and Arched slabs	1	B2.1
5	Design of reinforced concrete halls using Vierendeel girders	1	B2.1
6	Design and analysis of saw-tooth reinforced concrete halls	1	B1.1, B2.2
7	Structural systems for halls require natural North light	1	B2.2
8	General review of the course	1	B2.2

Course Coordinator: Prof. Dr. Hamed Asker

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

Date of Approval: December 2021

Course: **Concrete-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 system according to the given parameters. B1.2 Applying Structural Analysis and Mechanics, Properties and Strength of Materials.
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 reinforced concrete slabs, stairs and beams subjected to Torsional moment. B2.2 Achieve an optimum design of reinforced concrete Frames, Arches, Connections and saw tooth systems.

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 8326
Year/ Level	Third Year-Second Semester
Specialization	Major
Authorization data of course specification	December 2021

Teaching Hours	Lectures	Tutorial	Practical
	2	2	0

2. Course aims:

No.	Aim
1	Master a wide range of steel structures engineering knowledge and techniques to use them in steel structures projects.

3. Learning Outcomes (LOs):

B2.1	Achieve an optimum design of Steel structures.
B3.2	Plan Load Path through different structural elements.
B3.3	Assess Loads and straining actions on steel system.

4. Course Contents:

No.	Topics	week
1	Design beams subjected to static loadings.	1
2	Design of beams subjected to static and dynamic loadings	2
3	Design of columns and beam- columns	3
4	Design of total frames.	4
5	Design of rigid and semi-rigid connections	5,6
6	Design of bases (roller, hinged, fixed bases)	7
7	Design of composites structures	9,10
8	Design of bracings	11,12
9	Design of cold formed sections (thin-walled structures)	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 disabled 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, B3.2
2	Semester work (Quizzes, presentation, Portfolio)	B2.1, B3.3
3	Final Term Examination	B2.1, B3.2, B3.3

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	20%
2	Semester work (Quizzes, presentation, Portfolio)	20%
3	Final Term Examination	60%
Total		100 %

8. List of References

No.	Reference List
1	*Egyptian Code of Practice for Steel Construction (Load and Resistance Factor Design (LRFD) (205) Ministerial Decree No. 359-2007, Ministry of Housing, Utilities and Urban Development.*
2	*Egyptian Code of Practice for Steel Construction and Bridges (ASD) Code No. ECP 205-2001, Edit 2009. Ministry of Housing, Utilities and Urban Development.*
3	*Alan Williams. "Steel Structures Design (ASD/LRFD)". USA: International Code Council, 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

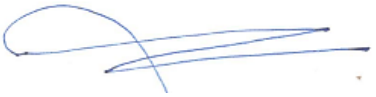
10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Design beams subjected to static loadings.		B2.1
2	Design of beams subjected to static and dynamic loadings	1	B2.1
3	Design of columns and beam- columns	1	B2.1
4	Design of total frames.	1	B2.1, B3.3
5	Design of rigid and semi-rigid connections	1	B2.1, B3.2
6	Design of bases (roller, hinged, fixed bases)	1	B2.1, B3.3
7	Design of composites structures	1	B2.1, B3.2
8	Design of bracings	1	B2.1
9	Design of cold formed sections (thin-walled structures)	1	B2.1

Course Coordinator: A. Prof. Dr. Fikry Abdo Salem

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

Date of Approval: December 2021



Course:Steel constructions 1*	
Program LOs	**Course LOs**
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.	**B3.2.** Plan Load Path through different structural elements. **B3.3.** Assess Loads and straining actions on steel system.
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 Steel structures.