جامعة بنها
كلية هندسة بنها
برنامج هندسة وإدارة التشييد
لجنة الجودة بالبرنامج

توصيف المقررات لبرنامج هندسة وإدارة التشييد
للائحة 2023 بنماذج 2025

Zero Level Courses Specifications

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	Analytical Geometry & Linear Algebra			
Course Code (according to the bylaw)	FRB ٠٠١			
Program/s participating in delivery of the course	Basic Engineering Sciences Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify) Tutorial	Total
	٢	٠	٢	٣ Credit hours
Course Type	Compulsory			
Academic level at which the course is taught	Zero Level			
Academic Program	Bachelor of Engineering (Construction Engineering and Management)			
Faculty/Institute	Benha Faculty of Engineering			
University/Academy	Benha University			
Name of Course Coordinator	Prof Dr. M A Elsisy			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	Approved in the Department Board Meeting Number (78) on 7/10/٢٠٢٥. Approved in the Faculty Board Meeting Number (461) on 18/11/٢٠٢٥.			

٢. Course Overview (Brief summary of scientific content)

Differential Calculus: Real functions and their graphs (Algebraic functions, trigonometric functions and their inverses, exponential, hyperbolic and logarithmic functions). Limits and continuity. Differentiation of real functions of one variable. Applications of differentiation (maxima, minima and inflection points, curve tracing, optimization problems). The first mean value theorem and first-order approximation of functions. Taylor's and Maclaurin's expansions of functions.

Algebra: Elements of mathematical logic with applications; matrix algebra and systems of linear equations (Gauss elimination, Gauss–Jordan elimination, LU factorization, matrix inversion). Applications (codes, matrix games). Eigenvalues and eigenvectors. Complex numbers

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO١	Identify the functions (algebraic, trigonometric and their inverses, exponential, logarithmic, and hyperbolic), and explain the concepts of limits and continuity.
		CLO٢	Apply differentiation rules to compute derivatives of real functions of one variable and solve problems involving maxima, minima, inflection points, curve tracing, optimization, the first mean value theorem, and Taylor and Maclaurin expansions.
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 context of sustainable design and development.	CLO٣	Analyze and solve systems of linear equations using Gauss elimination, Gauss–Jordan elimination, LU factorization, and matrix inversion, and examine eigenvalues and eigenvectors of matrices.
		CLO٤	Use and interpret matrix algebra, complex numbers, and logical principles to model and evaluate practical applications such as coding systems and matrix games.

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined) Tutorial
1	Functions: definition, properties, types, and their graphs.	٤	٢			٢
2	Inverse function, shift and reflection	٤	٢			٢
3	Limits and continuity.	٤	٢			٢
4	Differentiation rules of real functions of one variable	٤	٢			٢
5	Applications of derivatives (maxima, minima, and inflection points)	٤	٢			٢
6	Applications of derivatives (curve tracing and optimization problems)	٤	٢			٢
7	Taylor's and Maclaurin's series of functions of one variable.	٤	٢			٢
9	Matrices, their properties, and types.	٤	٢			٢
10	Rank of matrices and their inverses (Adjoint of matrix, Eigen equation)	٤	٢			٢
11	Inverse matrix (Gauss elimination). Existence and uniqueness of solutions	٤	٢			٢
12	Solving system of linear equations by Matrices (Gauss elimination, Gauss – Jordan elimination)	٤	٢			٢
13	Eigenvalues and eigenvectors.	٤	٢			٢
14	Complex numbers, Elements of mathematical logic with applications.	٤	٢			٢
15	Elements of mathematical logic with applications.	٤	٢			٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٤. Teaching and Learning Methods

١- Lecture
٢- Tutorials
٣- Problem-based Learning

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	First Midterm Exam written	Vth	٣٠	٣٠٪
٢	Second Midterm Exam written	١٠Th	٣٠	٣٠٪
٣	Final Written Exam	١٦th	٤٠	٤٠٪
٣	Assignments / Project /Portfolio/ Discussion	٥th, ٩th, ١٣Th	١٠	١٠%

٦. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Howard Anton, "Calculus with Analytical Geometry", John Wiley & Sons, Last Edition. Gilbert Strang, "Introduction to Linear Algebra", Wellesley-Cambridge Press, Last Edition.
	Other References	Applied Engineering Analysis, Tai-Ran Hsu, published by John Wiley & Sons, ٢٠١٨ (ISBN ٩٧٨١١١٩٠٧١٢٠٤) Thomas Jr., G.B., Weir, M.D. and Hass, J. " Thomas' Calculus", Pearson, Boston, New York, ١٢th Edition, ٢٠١٠.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students

Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	Data Show System Sound System
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Prof Dr M A Elsisy



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Integration & Multivariable Functions**			
Course Code (according to the bylaw)	**FRB ٠٠٢**			
Department/s participating in delivery of the course	**Basic Engineering Sciences Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Zero level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Ass. Prof. Doaa Ahmed Abd-Elwahab Hammad**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department/committee/council...)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Integration: Techniques of integration (Basic Integration Formulas, Integration by Parts, Integration of Rational Functions by Partial Fractions, Trigonometric Integrals and Substitutions). Applications of indefinite integrals. Applications of definite integrals (areas, volumes of revolution, lengths of curves and surface areas of revolution).

Multivariable functions: Curves and surfaces in three dimensions. Limits, continuity and partial derivatives of functions of several variables. Chain Rule. Directional and total derivatives. Applications (tangent planes and normal lines, Taylor series of functions of two variables, Extreme values and conditional extreme values of functions of two variables).

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO١	Identify the basic items of the course.
		CLO٢	Explain how to use all items of the course in applied engineering problems
A٣	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.	CLO٣	Solve the suitable solution methods for various mathematics elements
		CLO٤	Analyze the different problems and verifications

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussions

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Indefinite integrals with applications ١	٤	٢	٢
2	Indefinite integrals with applications ٢	٤	٢	٢
3	Methods of integration ١	٤	٢	٢
4	Methods of integration ٢	٤	٢	٢
5	Definite integrals with applications	٤	٢	٢
6	Areas and volumes of revolution, lengths of curves and surface area	٤	٢	٢
7	First Mid-Term Exam	٤	٢	٢
8	Surfaces and curves in three dimensions ١	٤	٢	٢
9	Surfaces and curves in three dimensions ٢	٤	٢	٢
10	Vector functions of one variable	٤	٢	٢
11	Scalar functions of several variables, partial derivatives	٤	٢	٢
12	Second Mid-Term Exam	٤	٢	٢
13	Directional derivatives, total derivatives	٤	٢	٢
14	Tangent planes and normal lines	٤	٢	٢
15	Taylor expansions, maxima and minima, Lagrange's multipliers	٤	٢	٢

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	V	٣٠	٣٠
٢	**٢ND Mid-term exam (practical + Oral)**	١٢	٢٠	٢٠
	Student activities (assignment / Project /Portfolio/ Logbook)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Calculus for Engineering Students Fundamentals, Real Problems, and Computers ٢٠٢٠
	Other References	A Modern Theory of Integration By Robert G. Bartle · 2024
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Ass. Prof. Doaa Ahmed Abd-Elwahab Hammad



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Statics**			
Course Code (according to the bylaw)	**FRB ٠٠٣**			
Department/s participating in delivery of the course	**Basic Engineering Sciences Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Zero level**			
Academic Program	**Multidisciplinary Programs with Credit Hours**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Ahmed El Desouky Ahmed**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes: Vector algebra and applications to mechanics, Statics of particles in three dimensions, Moment of a forces about a point and a line and moment of couples, Equivalent systems of forces, Equilibrium of rigid bodies, Centroids and centers of gravity, Analysis of structures, Friction and its application, Moment of inertia of Areas and masses.

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	CLO١	Predict the static equilibrium conditions of a particle under the action of forces
		CLO٢	Apply the static equilibrium conditions of a rigid body under the action of various loads.
A٢	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.	CLO٣	Analyze the forces acting on the members of structures composed of pin-connected members.
		CLO٤	Determine the location of the centroid and the moment of inertia for a body of a regular or irregular shape.

٣. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussion

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Vector algebra and applications to mechanics	٤	٢	٢
2	Analysis of Structures: Trusses (method of joints)	٤	٢	٢
3	Analysis of Structures: Trusses (method of joints)	٤	٢	٢
4	Analysis of Structures: Trusses (method of sections)	٤	٢	٢
5	Statics of particles in three dimensions	٤	٢	٢
6	Statics of particles in three dimensions	٤	٢	٢
7	First Mid-Term Exam	٤	٢	٢
8	Moment of a forces about a point and a line and moment of couples	٤	٢	٢
9	Moment of a forces about a point and a line and moment of couples	٤	٢	٢
10	Equivalent systems of forces	٤	٢	٢
11	Equilibrium of Rigid bodies	٤	٢	٢
12	Second Mid-Term Exam	٤	٢	٢
13	Centroids and centers of gravity	٤	٢	٢
14	Moment of inertia of Areas and masses	٤	٢	٢
15	Friction and its application	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٤. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam	١٢	٢٠	٢٠
	Student activities (assignment)	Throughout semester	٥	٥
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes	Throughout semester	٥	٥
TOTAL			١٠٠	١٠٠

٥. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course	Vector Mechanics for Engineers: Statics, ١٢th Edition, Ferdinand P. Beer, E. Russell Johnston, ٢٠١٩.
	Other References	Engineering Mechanics, Statics, ١٤th Edition- Hibbeler, ٢٠١٩.
	Electronic Sources	NA
	Learning Platforms	NA
	Other	Course Notes are available with all the slides used in lectures in electronic form to students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator
Dr Ahmed El Desouky Ahmed

Name and Signature
Program Coordinator

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	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Dynamics**			
Course Code (according to the bylaw)	**FRB ٠٠٤**			
Department/s participating in delivery of the course	**Basic Engineering Sciences Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Zero level**			
Academic Program	**Bachelor of Engineering in Construction Engineering and Management**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Ahmed El Desouky Ahmed**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes: Kinematics of particles (rectilinear and curvilinear motion), Kinetics of particles (Newton's second law – principle of work and energy – principle of impulse and momentum - impact), Kinematics of rigid bodies (translation, rotation about a fixed axis and general plane motion), Kinetics of rigid bodies (force and acceleration method).

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	CLO١	Describe the particle motion along different trajectories using different coordinate systems.
		CLO٢	Apply the equilibrium conditions of motion for a particle using Newton's second law, the principle of conservation of energy, and the principle of conservation of linear momentum.
A٢	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.	CLO٣	Analyse the various types of rigid-body planar motion.
		CLO٤	Apply the equilibrium conditions of motion for a rigid body using Newton's second law.

٣. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussion

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Kinematics of particles (Rectilinear motion) ١	٤	٢	٢
2	Kinematics of particles (Rectilinear motion) ٢	٤	٢	٢
3	Kinematics of particles (curvilinear motion) ١	٤	٢	٢
4	Kinematics of particles (curvilinear motion) ٢	٤	٢	٢
5	Kinetics of particles (force and acceleration method) ١	٤	٢	٢
6	Kinetics of particles (force and acceleration method) ٢	٤	٢	٢
7	First Mid-Term Exam	٤	٢	٢
8	Kinetics of particles (work and energy method)	٤	٢	٢
9	Kinetics of particles (impulse and momentum method)	٤	٢	٢
10	Kinetics of particles (impact)	٤	٢	٢
11	Kinematics of Rigid bodies:(Translation, Rotation)	٤	٢	٢
12	Second Mid-Term Exam	٤	٢	٢
13	Kinematics of Rigid bodies: (General plane motion)١	٤	٢	٢
14	Kinematics of Rigid bodies: (General plane motion) ٢	٤	٢	٢
15	Kinetics of Rigid bodies (Force and acceleration method)	٤	٢	٢

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٤. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST **Mid-term exam (written)**	V	٣٠	٣٠

٢	٢ND Mid-term exam	١٢	٣٠	٣٠
	Student activities (assignment)	Throughout semester	٥	٥
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes	Throughout semester	٥	٥
TOTAL			١٠٠	١٠٠

٥. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course	Vector Mechanics for Engineers: Dynamics, ١٢th Edition Ferdinand P. Beer, E. Russell Johnston, ٢٠١٩.
	Other References	Engineering Mechanics, Dynamics, ١٤th Edition- Hibbeler, ٢٠١٩.
	Electronic Sources	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms	Welcome! - Thinqi MICROSOFT TEAMS
	Other	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Dr Ahmed El Desouky Ahmed

Program Coordinator
Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	Waves and Heat			
Course Code (according to the bylaw)	FRB ٠٠٥			
Department/s participating in delivery of the course	Basic Engineering Sciences			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Tut.	Total
	٢	٢	١	٣
Course Type	اجباري			
Academic level at which the course is taught	المستوى الصفرى			
Academic Program	Construction Engineering ang Management Program			
Faculty/Institute	Benha Faculty of Engineering			
University/Academy	Benha University			
Name of Course Coordinator	Dr. Mohamed Okil			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	Approved in the Department Board Meeting Number (78) on 7/10/٢٠٢٥ Approved in the Faculty Board Meeting Number (461) on 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Simple harmonic motion, Wave motion, Sound waves, Superposition of waves, Interference of light waves, Diffraction of light, First law of thermodynamics, Kinetic theory of gases, specific heats of gases, thermodynamic processes: isochoric, isobaric, isothermal, and adiabatic, Heat transfer: conduction, convection and radiation, Elasticity, Hooke's law, Hydrostatics and surface tension, Hydrodynamics and Viscosity.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, analyze, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	CLO١	**Explain** the concept of waves, their types and mathematical description, some of their physical phenomena with a few simple applications on mechanical waves and superposition of waves.
		CLO٢	**Discuss** Young's interference of light, Thin Film, single-slit diffraction, and Diffraction Grating.
		CLO٣	**Explain** the meaning and concept of thermodynamics, its main and principal physical quantities, thermodynamic processes, the first law of thermodynamics, ideal gas and its properties, and heat transfer.
		CLO٤	**Discuss** some of the basic topics on the properties of matter, explaining stress and strain and Hooke's law in elasticity and the equation of continuity, Bernoulli's equation and its applications, viscosity, and surface tension in fluid mechanics.
A٢	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.	CLO٥	Practically **examine** different physical concepts using basic instruments in the lab.

٤. Teaching and Learning Methods

١- Lecture.
٢. Practical-based Learning.
٣. Tutorials.

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours		
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/Clinical/ .....)	Tutorial
1	Wave motion	5	2	2	1
2	Wave motion	5	2	2	1
3	Sound waves	5	2	2	1
4	Superposition of waves	5	2	2	1
5	Interference of light	5	2	2	1
6	Interference of light	5	2	2	1
7	١st Midterm Exam				
8	Diffraction of light	5	2	2	1
9	Heat and ١st law of thermodynamics	5	2	2	1
10	Ideal gas and its properties	5	2	2	1
11	Ideal gas and its properties	5	2	2	1
12	Practical/Oral Exam				
13	Heat transfer	5	2	2	1
14	Properties of matter	5	2	2	1
15	Properties of matter	5	2	2	1

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	١st Midterm Exam (Semester work)	٧th	٣٠	٣٠ %
٢	Experimental Exam (Semester work)	١٣th	٢٠	٢٠ %
٣	Final Written Exam	١٦th	٤٠	٤٠ %
٤	Student activities (assignment)	throughout semester	١٠	١٠ %

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Tarek M. Abdolkader, Mohamed Elfaham, Mina Asham, Ibrahim Maged, Walid Selmy, "Engineering Physics, Part I, Waves, Heat and Optics", 1st edition, 202٤.
	Other References	• R. A. Serway and J. W. Jewett, Physics for scientists and engineers: Cengage learning, ٢٠١٨. • D. Halliday, et al., Fundamentals of physics: John Wiley & Sons, ٢٠١٣. • D. Giancoli, Physics for Scientists & Engineers with Modern Physics, ٤th Edition ed. Pearson, ٢٠٠٨.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Mohamed Okil



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Electricity and Magnetism**			
Course Code (according to the bylaw)	**FRB ٠٠٦**			
Program/s participating in delivery of the course	**Basic Engineering Sciences**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	١	٣
Course Type	**Compulsory**			
Academic level at which the course is taught	**Zero Level**			
Academic Program	**Bachelor of Engineering in Construction Engineering and Management Program**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Assoc. Prof. Ibrahim Maged**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

The course covers Electric field, Gauss's law and applications, Electric potential, Capacitors and dielectrics, Current and resistance, Magnetic field and magnetic force, Sources of magnetic field, Ampere's law, Faraday's law, Self-induction and magnetic energy.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, analyze, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	CLO١	**Study** the electric force, electric field, and Gauss's law in electricity with some of its applications
		CLO٢	**Discuss** the electric potential, capacitors and electric current and resistance.
		CLO٣	**Explain** the magnetic field and magnetic force, and Ampere's law and its applications (sources of magnetic field).
		CLO٤	**Study** Faraday's law, self-induction and magnetic energy.
A٢	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.	CLO٥	Practically **examine** different physical concepts using basic instruments in the lab.

٤. Teaching and Learning Methods

١. Lecture
٢. Practical-based Learning
3. Tutorials

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/ Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (Tutorial)
١	Electric field	٥	٢	٢	٠	١
٢	Electric field	٥	٢	٢	٠	١
٣	Gauss's law	٥	٢	٢	٠	١
٤	Electric potential	٥	٢	٢	٠	١
٥	Capacitance	٥	٢	٢	٠	١
٦	Capacitance	٥	٢	٢	٠	١
٧	First Exam					
٨	Electrical current and resistance	٥	٢	٢	٠	١
٩	Electrical current and resistance	٥	٢	٢	٠	١
١٠	Magnetic field	٥	٢	٢	٠	١
١١	Sources of magnetic field	٥	٢	٢	٠	١
١٢	Second Exam					
١٣	Sources of magnetic field	٥	٢	٢	٠	١
١٤	Faraday's law	٥	٢	٢	٠	١
١٥	Induction	٥	٢	٢	٠	١

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	Exam ١ written (Semester work)	٧	٣٠	٣٠٪
٢	Exam ٢ Lab Exam (Semester work)	١٢	٢٠	٢٠٪
٣	Final Written Exam	١٦	٤٠	٤٠٪
٤	Assignment	All	١٠	١٠٪

٦. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Tarek M. Abdolkader, Mohamed Elfaham, Mina Asham, Ibrahim Maged, Walid Selmy, "Engineering Physics, Part II, Electricity and Magnetism", 1st edition, 2022.
	Other References	• R. A. Serway and J. W. Jewett, Physics for scientists and engineers: Cengage learning, ٢٠١٨. • D. Halliday, et al., Fundamentals of physics: John Wiley & Sons, ٢٠١٣. • D. Giancoli, Physics for Scientists & Engineers with Modern Physics, ٤th Edition ed. Pearson, ٢٠٠٨.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form to students
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	Projector/Data Show
	Supplies	White Board
	Electronic Programs	NA
	Skill Labs/ Simulators	Laboratory
	Virtual Labs	NA
	Other (to be mentioned)	NA

Course Coordinator

Assoc. Prof. Ibrahim Maged

Program Coordinator

Dr. Ahmed Gamal

Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Chemistry for Engineers**			
Course Code (according to the bylaw)	**FRB ٠٠٧**			
Program/s participating in delivery of the course	**Basic Engineering Sciences Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify) Tutorial**	**Total**
	٣	٢	١	٤ Credit hours
Course Type	**Compulsory**			
Academic level at which the course is taught	**Zero Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Prof. Elsayed Fouad**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥. **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥.			

٢. Course Overview (Brief summary of scientific content)

Gases: ideal & real gas laws, kinetic molecular theory - Liquids and solutions - Solids: arrangement of atoms, metallic solids, alloys - Chemical kinetics: reaction rates & order, catalysis – Electrochemistry: electrochemical cells, corrosion– Cements – Polymers – lubricants.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics	CLO١	Explain gas laws and differentiate between ideal and real gas behavior.
		CLO2	Recognize the intermolecular forces and solutions' colligative properties. Familiarize with the basic principles of lubrication and selection of lubricant.
		CLO3	Describe bonding that can be applied to affect the properties of solids. Identify properties of polymers and their characteristics. Specify requirements of clinker and chemical admixtures used in concrete technology
		CLO4	Identify reaction order to determine rate law. Recognize different factors affecting it.
A٢	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.	CLO٥	Recognize redox reactions and different types of electrochemical cells. Make stoichiometric calculations for electrolytic processes. Recognize corrosion and basic principles to control.
		CLO٦	Perform laboratory experiments correctly using appropriate techniques and safety procedures and communicate the results of their experiments via written laboratory reports

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials.
3. Practical-based Learning
4. Problem-based Learning
5. Interactive learning

Course Schedule

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Gas laws & molecular theory, Deviation from ideal gas to real behavior	6	3	3
2	Gas laws & molecular theory, Deviation from ideal gas to real behavior	6	3	3
3	Intermolecular forces & properties of liquids, phase diagrams, Solution process, Colligative properties	6	3	3
4	Intermolecular forces& properties of liquids, phase diagrams, Solution process, Colligative properties	6	3	3
5	Structure and bonding in solids, Types of crystalline solids	6	3	3
6	Reaction rates and the dependence of rate on concentration	6	3	3
7	Dependence of reaction rate on concentration, Temperature and catalysis	6	3	3
8	Dependence of reaction rate on concentration, temperature, and catalysis	6	3	3
9	Oxidation-reduction reactions, types of electrochemical cells. Corrosion and basic principles to corrosion control	6	3	3
10	Oxidation-reduction reactions, types of electrochemical cells. Corrosion and basic principles of corrosion control	6	3	3
11	Polymerization reactions, Members of the polymer family	6	3	3
12	Oral & Experimental Test	6	3	3
13	Lubricants	6	3	3
14	Lubricants	6	3	3
15	Cement	6	3	3

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	Exam ١written (Semester work)	٨	٣٠	٣٠
٢	Semester work	١-١٤	١٠	١٠
٣	Final Written Exam	١٦	٤٠	٤٠
٤	Final Practical/Clinical/... Exam	١٤	٢٠	٢٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	- P. Barnes, J. Bensted, Structure and Performance of Cements, CRC Press, ٢nd Edition, ٢٠١٩. - Jeffrey Gaffney, Nancy Marley, General Chemistry for Engineers (Enhanced Edition), Elsevier; ٢٠١٨.
	Other References	Brown, Lawrence S. and Holme, Thomas, "Chemistry for Engineering Students, ٤th Edition" (٢٠١٨). Chemistry Books. ١.https://lib.dr.iastate.edu/chem_books/١
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Elsayed Fouad, Textbook of Engineering Chemistry, ٢٠٢٣.
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	
	Supplies	**Glassware, Chemicals**
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Prof. Elsayed Fouad

Program Coordinator
Dr Ahmed Gamal

Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Computer Programming**			
Course Code (according to the bylaw)	**FRE ٠١٢**			
Program/s participating in delivery of the course	**Construction Engineering and Management Program**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	٠	٢	٢	٢
Course Type	**Compulsory**			
Academic level at which the course is taught	**Zero Level**			
Academic Program	**Bachelor of Engineering in Construction Engineering and Management**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Ayman Soliman**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number** (78) **on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number** (461) **on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Introduction to Computer Programming, Basics of C++ language, Problem Solving and Algorithm Design, Pseudo-codes and Flow charts, Arithmetic Operators and Variables, Exploring input and output statements, Control Structure (Selection and iterative), Functions, Primary data structure of Arrays and its multi–dimensional behavior, Concepts of Pointers, Introductory knowledge of Structures.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO١	**Identify** the digital world, networks, and the developments in computer hardware and software from the first generation to the present.
		CLO٢	**Explain the** data representation and work with different number systems.
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.	CLO٣	**Use** algorithms, flowcharts, and pseudo code to solve engineering problems.
		CLO٤	**Apply** computer software to solve problems using flowcharts and a specific programming language.

٤. Teaching and Learning Methods

1. Lectures
2. Labs
3. Reports

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/Clinical/ .....)	Self-learning (Tasks/ Assignments / Projects/ ...)	Other (to be determined)
1	Historical introduction, computer classification, Computer Networks and the Internet, computer and society	٤	---	٢	٢	---
2	Data representation, and number systems	٤	---	٢	٢	---
3	Computer components	٤	---	٢	٢	---
4	Present the computer software basics and operating systems.	٤	---	٢	٢	---
5	First exam	٤	---	٢	٢	---
6	Algorithms, and flowcharts	٤	---	٢	٢	---
7	Introduction to computer programming languages	٤	---	٢	٢	---
8	High-level languages	٤	---	---	---	---
9	Experimental Test	٤	---	٢	٢	---
10	High-level languages	٤	---	٢	٢	---

٥. Methods of students' assessment

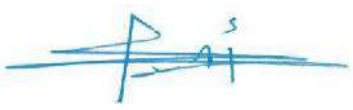
No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	Exam ١written (Semester work)	٨	٣٠	٣٠٪
٢	Exam ٢ ..... (Semester work)			
٣	Final Written Exam	١٦	٤٠	٤٠٪
	Final Practical/Clinical/... Exam	١٤	٣٠	٣٠٪
	Final Oral Exam			
	Assignments / Project /Portfolio/ Logbook	٥,١٠	١٠	١٠٪
	Field training			
	Other (Mention)			

٦. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Deborah Morley and Charles S. Parker, "Understanding Computers: Today and Tomorrow", Comprehensive Cengage Learning; ١٦th Edition ٢٠١٧. • David I. Schneider, "Introduction to Programming Using Python", Pearson Education Limited, ١st Edition ٢٠١٦.
	Other References	Joseph Connor, "computer programming for beginners- Learn the Basic of Java, SQL & C++", ٤th Edition (١٧Aug. ٢٠١٥)
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator

Dr Ayman Soliman



Program Coordinator

Dr. Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Production Systems Engineering**				
Course Code (according to the bylaw)	**FRM٠٠٨**				
Program/s participating in delivery of the course	**Computers and Embedded Systems Engineering Program**				
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tut.**	**Total**	**Credit hours**
	١	٣	٠	٤	٢
Course Type	**Compulsory**				
Academic level at which the course is taught	**Level ٠**				
Academic Program	**Bachelor of Engineering of Construction Engineering and Management**				
Faculty/Institute	**Benha Faculty of Engineering**				
University/Academy	**Benha University**				
Name of Course Coordinator	**prof. Saleh kaytbay**				
Course Specification Approval Date	1/٩/٢٠٢٥				
Course Specification Approval (Attach the decision/minutes of the department /committee/council..)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥				

٢. Course Overview (Brief summary of scientific content)

This course introduces the fundamentals of manufacturing and production engineering. It covers classification of manufacturing industries and different types of manufacturing operations, including shaping. The course also studies engineering materials such as metals (ferrous and non-ferrous). The course also includes heat treatment methods used to modify material properties, as well as an introduction to powder metallurgy, including powder production, compaction, and sintering processes. And Including, Casting processes: Main steps of sand casting, Pattern design, melting of metals, Metal forming techniques: Forging, Rolling, Extrusion, Drawing, Bending Processes: Temporary and permanent joints, welding techniques, cutting techniques: Principles and elements of cutting processes, Basic cutting, and machining (Turning, Drilling, Milling, etc.,). Production planning and control principles, Fundamentals of quality control.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO ١	Apply knowledge of mathematics, science, and engineering to the evaluation of equipment and methods for production of products.
		CLO ٢	Identify the selection of equipment and methods for production of products.
		CLO ٣	Apply engineering fundamentals and analyses to the planning, selection, and utilization of production equipment. Through understanding of: The total production process, from inspection of the idea through construction and start-up.
A٦	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO ٤	Select the most cost-effective manner to produce the intended quality

٤. Teaching and Learning Methods

١- Lecture
٢- Tutorials
٣- Practical-Based Learning
٤- Self-learning
٥- Hybrid Learning

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (Lectures)	Training (Tutorials)	Self-learning (Assignments)	Other
١	Introduction, Casting processes	٤	١	٢		
٢	Forging	٤	١	٢	١	
٣	Rolling,	٤	١	٢	١	
٤	Extrusion	٤	١	٢	١	
٥	Drawing	٤	١	٢	١	
٦	Bending Processes	٤	١	٢	١	
٧	**Mid Term Exam**					
٨	Temporary and permanent joints	٤	١	٢	١	
٩	welding techniques	٤	١	٢	١	
١٠	cutting techniques (traditional methods)	٤	١	٢	١	
١١	cutting techniques (non-traditional methods)	٤	١	٢	١	
١٢	**Practical/Oral Exam**					
١٣	Production planning and control principles	٤	١	٢	١	
١٤,١٥	Fundamentals of quality control	٤	١	٢	١	
١٦	**Final Exam**					

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	Mid-Term Written Exam	٧	٣٠	٣٠%
٢	Student activities (assignment, reports)	Throughout all weeks	١٠	١٠%
٣	Practical/Oral Exam	١٢	٢٠	٢٠%
٤	Final Written Exam	١٦	٤٠	٤٠%

٦. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course**	١-Jiangshan Li, Semyon M. Meerkov, ٢٠٠٨, "Production Essential Books (Textbooks)
	Other References	٢- Systems Engineering", Springer; 1st ed. 2009 edition, ٢٠٠٨M. P. Groover, ٢٠١١, "Principles of Modern Manufacturing", ٤th Ed., john Wiley & Sons, Inc.
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	Data Show
	Supplies	Workshops
	Electronic Programs	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Prof. Saleh Kaytbay

Program Coordinator
Dr Ahmed Gamal

Construction Engineering And Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Engineering Drawing**			
Course Code (according to the bylaw)	**FRM ٠٠٩**			
Program/s participating in delivery of the course	**Construction Engineering And Management Program**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	-	-	٤	٢
Course Type	**Compulsory**			
Academic level at which the course is taught	**Zero level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Abdelrahman Elgendy**			
Course Specification Approval Date	**1/٩/٢٠٢٥**			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on 7/10/٢٠٢٥** **Approved in the Faculty Board Meeting Number (461) on 18/11/٢٠٢٥**			

٢. Course Overview (Brief summary of scientific content)

Principles and skills of Engineering drawing. Conventional lettering and dimensioning. Geometric constructions. Orthographic projection of engineering bodies. Theories of view derivation. Derivation of views from isometric drawings and deducing missing views. Sectioning views: (full, half, offset, partial, revolved, removed, and partial sectioning). Steel construction, Symbols of electrical circuits.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A6	Plan, supervise, and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO١	Illustrate the engineering drawing (drawing tools, tangency, projections, isometrics, missing views, …)
		CLO٢	Define the geometry of engineering objects and steel structure.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO٣	Evaluate the drawing rules in engineering drawing
		CLO٤	Solve problems in the sectioning of engineering objects.

٤. Teaching and Learning Methods

١- Lecture Hall
٢. Data show
٣. Whiteboard

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/Clinical/ .....)	Self-learning (Tasks/ Assignments / Projects/ ...)	Other (to be determined)
1	Introduction to engineering graphics	٤		٤		
2	Geometric construction	٤		٤		
3	Geometric construction	٤		٤		
4	Isometric graphics	٤		٤		
5	Isometric graphics	٤		٤		
6	Orthograph projection from isometric	٤		٤		
7	First midterm Exam					
8	Orthograph projection – missing view	٤		٤		
9	Orthograph projection – missing view	٤		٤		
10	Section view	٤		٤		
11	Section view	٤		٤		
12	Second Midterm Exam					
13	Steel constructions	٤		٤		
14	Steel constructions	٤		٤		
15	Symbols of electric circuit + Revision	٤		٤		

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	Exam ١written (Semester work)	٧		٣٠%
٢	Exam ٢ ..... (Semester work)	١٢		٣٠%
٣	Final Written Exam	١٦		٤٠ %
٤	Assignments / Project /Portfolio	٣-١٤		١٠%

٦. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	William Chalk, Goetsch, "Technical Drawing", Delmar technical graphics series, ٦th edition, ٢٠١٠.
	Other References	Albert W. Boundy, "Engineering Drawing", McGraw-Hill Australia, ٢٠١٢
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator
Dr. Abdelrahman Elgendy



Name and Signature
Program Coordinator
Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Engineering Drawing by Computer**			
Course Code (according to the bylaw)	**FRM ٠١٠**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	١	٢	٠	٢
Course Type	Compulsory			
Academic level at which the course is taught	**Zero level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Muhammed Magdy Gaafar**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Introduction to Computer-Aided Drawing and its benefits for engineering visualization. The course covers industry standards for creating ٢D drawings, including sketching, geometric construction of mechanical components, orthographic projection, section views, and assembly/detail drawings using SolidWorks software. Students learn CAD construction techniques, graphical communication principles, and ٢D modeling of mechanical components essential for mechatronics applications

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	CLO ١	Apply industry-standard drafting conventions for engineering drawing.
		CLO ٢	Discuss fundamental CAD commands, tools, and techniques for creating ٢D drawings.
A ٩	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO ٣	Use engineering standards and specifications for drawing.
		CLO ٤	Utilize SolidWorks features for clear and well-organized technical drawings.

٤. Teaching and Learning Methods

١. Lecture
٢. Interactive Learning
٣. Computer-based Instruction

Course Schedule*

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined)
١	Introduction to Computer Aided Drawing.	٣	١	٢		
٢	Industry standard for drawing	٣	١	٢		
٣	The visualization, sketching, and geometric construction of mechanical components	٣	١	٢		
٤		٣	١	٢		
٥		٣	١	٢		
٦		٣	١	٢		
٧	First Experimental Exam	٣	١	٢		
٨	Illustrate CAD drawing construction techniques	٣	١	٢		
٩	Creation of assembly and detailed mechanical components.	٣	١	٢		
١٠		٣	١	٢		
١١		٣	١	٢		
١٢	٣D drawing of Mechanical Component	٣	١	٢		
١٣	Second Experimental Exam	٣	١	٢		
١٤	Revision	٣	١	٢		
١٥	Practical and oral Exam	٣	١	٢		

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	Exam ١ (Semester work)	Week ٧	٣٠	٣٠٪
٢	Exam ٢ (Semester work)	Week ١٣	٣٠	٣٠٪
٣	Final Practical/Clinical/... Exam	Week ١٥	٤٠	٤٠ %
٤	Assignments / Activity	Week ١-١٥	١٠	١٠٪

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	William Chalk, Goetsch, "Technical Drawing", Delmar technical graphics series, ٦th edition,٢٠١٠.
	Other References	• Allbert W. Boundy, "Engineering Drawing", McGraw-Hill Australia, ٢٠١٢
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Muhammed Gaafar



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Foreign Language**			
Course Code (according to the bylaw)	**UHS١٠١**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٠	٢
Course Type	Compulsory			
Academic level at which the course is taught	**Zero level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Yasmin Mohammed El-Sayed**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

The characteristics of the foreign language (English, Deutsch, French, or any foreign language approved by the academic department council and both the faculty and university councils) - Revision of the language grammar – grammar style and effective sentences and their characteristics – Identification of common errors in writing technical sentences – Building basic paragraphs: types of paragraphs, reading and analyzing of excerpts from books in varies disciplines to develop communication skills.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٨	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO١	**Apply** basic research skills through constructing a project related to an engineering or science-related situation.
		CLO٢	**Identify** the appropriate written and oral communication in different situations in English.
		CLO٣	**Communicate** efficiently to convey ideas verbally.
		CLO٤	**Discuss** abstract ideas and arguments from a range of texts.
		CLO٥	**Use of** vocabulary as a key ingredient in developing advanced written skills.
A١٠	Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.	CLO٦	**Practice** a range of grammatical structures and vocabulary accurately and effectively.

٤. Teaching and Learning Methods

1. Lecture
2. Interactive learning
3. Self-learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	**Introduction**	2	2	------
2	**Drawings**	2	2	------
3	**Active & Passive**	2	2	------
4	**Numbers**	2	2	------
5	**Numbers, Quantity, Degree & Intensity**	2	2	------
6	**Overview of Some Basic Tenses (١)**	2	2	------
7	**Midterm ١**	2	2	------
8	**Energy**	2	2	------
9	**Overview of Some Basic Tenses (٢)**	2	2	------
10	**Materials & Suppliers**	2	2	------
11	**Writing a report**	2	2	------
12	**Midterm ٢**	2	2	------
13	**Innovation & Invention**	2	2	------
14	**Heat & temperature**	2	2	------
15	**Review**	2	2	------

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	V	٣٠	٣٠

٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Ibbotson, Mark. (٢٠٠٩). Professional English In Use: Engineering. Cambridge University Press
	Other References	McCarthy, Michael & O'Dell, Felecity. (2017). English Vocabulary in Use. Cambridge University Press. Mascull, Bill. (٢٠١٧) Business Vocabulary in Use (٣rd ed.). Cambridge University Press. Gray, Loretta. (٢٠١٩) Prctice Makes Perfect: English tenses (٣rd ed.). McGraw Hill.
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	White Board – Data show
	Supplies	NA
	Electronic Programs	zoom
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Mohamed Abd El-Ghany

Name and Signature
Program Coordinator

Dr. Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Information and Communication Technology**			
Course Code (according to the bylaw)	**UHS١٠٢**			
Department/s participating in delivery of the course	**Electrical Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٠	٢
Course Type	**Compulsory**			
Academic level at which the course is taught	Level Zero			
Academic Program	**Bachelor of engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Tamer Omar Mohamed Diab**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes: Concepts and terminologies of information technology – Communication styles in teaching and learning – The internet and learning – multimedia systems – databases – Virtual Reality –Augmented reality – Internet of Things – Robotics and its classification – Artificial Intelligence – Big data – Cloud Computing.

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO١	Utilize the basic concepts and requirements learnt for internet connectivity.
		CLO٢	Use the techniques, skills and modern ICT tools necessary for engineering practice
A١٠	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO٣	Acquire different learning techniques and applications in ICT-enabled learning environment
		CLO٤	Apply intelligent techniques in learning and scientific research

٣. Teaching and Learning Methods

1. Lecture
2. Report
3. Self-learning
4. Hybrid Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to Information Communication Technology and Its Applications	٢	٢	٠
2	Introduction to Information Communication Technology and Its Applications	٢	٢	٠
3	Types and components of computer systems	٢	٢	٠
4	Data Communication and Networking	٤	٢	٠
5	Data Communication and Networking	٤	٢	٠
6	Internet	٢	٢	٠
7	**١st Exam**			
8	Introduction to Data analysis and management	٢	٢	٠
9	Introduction to Virtual Environment Technology	٢	٢	٠
10	Concepts and Definitions of The Internet of Things	٢	٢	٠
11	An introduction to Robot Technology	٢	٢	٠
12	**٢nd Exam**			
13	AI and its Applications	٤	٢	٠
14	AI and its Applications	٤	٢	٠
15	Cloud Computing	٢	٢	٠
16	**Final Exam**			

٤. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam**	١٢	٢٠	٢٠
٣	**Student activities (Report)**	**Throughout semester**	١٠	١٠
٤	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
TOTAL			١٠٠	١٠٠

٥. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	TL Limited ITL Education Solutions Limited, "Introduction to Information Technology", 2nd edition, ٢٠١٢, Pearson Education, ISBN: ٩٧٨٩٣٣٢٥٢٥١٤٦
	Other References	Floyd Fuller, Brain Larson, Lisa Bucki, Faithe Wempen, "Computers: Understanding Technology Comprehensive ", 6th edition, 2016, Kendall Hunt Publishing, ISBN-١٣: ٩٧٨-٠٧٦٣٨٧٠٠٨٩
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	**ZOOM Workplace**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Tamer Omar

Tamer Omar

Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Social Issues**			
Course Code (according to the bylaw)	**UHS ١٠٣**			
Department/s participating in delivery of the course	**Construction Engineering and Management**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	**0**	**0**	**2**
Course Type	Compulsory			
Academic level at which the course is taught	**Zero level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mohamed Omama Mohamed**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

In this course, the social problems facing societies in the modern era are studied. Topics include problems related to the population issue, citizenship, a culture of tolerance and acceptance of the other, globalization, and violence against women. Social problems will be analyzed from different social perspectives to better understand their possible causes and consequences. Strategies for addressing social problems will be discussed and evaluated.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	COL١	**Examine** scientific research, various types of research, appropriate methods, technologies and data that sociologists use to investigate the human condition;
		COL٢	Analyze various social issues related to the individual as a member of multicultural teams.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	COL٣	Practice self-learning strategies in different social issues.
		CLO٤	**Evaluate** competing social scientific theories regarding the origins of social problems using lifelong and other learning strategies.

٤. Teaching and Learning Methods

1. Lecture
2. Report
3. Self-learning
4. Hybrid Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to social issues.	٢	٢	٠
2	Recognize the structural, systemic factors that affect the quality of life of persons of different ages, gender, social class, sexual orientation, disability, and racial/ethnic backgrounds	٢	٢	٠
3	Recognize the structural, systemic factors that affect the quality of life of persons of different ages, gender, social class, sexual orientation, disability, and racial/ethnic backgrounds	٢	٢	٠
4	Problems related to the population issue.	٢	٢	٠
5	Problems related to the population issue.	٢	٢	٠
6	Problems related to citizenship	٢	٢	٠
7	First Exam	٢	٢	٠
8	Problems related to citizenship	٢	٢	٠
9	Problems related to a culture of tolerance and acceptance of the other.	٢	٢	٠
10	Problems related to a culture of tolerance and acceptance of the other.	٢	٢	٠
11	Problems related to globalization	٢	٢	٠
12	Second Exam	٢	٢	٠
13	Problems related to violence against women	٢	٢	٠
14	Present alternative explanations or theories of social phenomena	٢	٢	٠
15	Review	5	2	3

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam (practical + Oral)**	١٢	٢٠	٢٠

	Student activities (assignment, report)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Lecturer Notes. Lauer, Robert and Jeanette Lauer. 2016. Social Problems and the Quality of Life, 13th Edition. New York: NY. McGraw Hill w/Conne
	Other References	https://beng.bu.edu.eg/item/1739-2022-05-29-11-57-14
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mohamed Omama Mohamed

Mohamed Omama

Name and Signature
Program Coordinator

Dr Ahmed Gamal



First Level Courses Specifications

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Basic Architectural Engineering**			
Course Code (according to the bylaw)	**CMA ١٠٧**			
Department/s participating in delivery of the course	**Architectural Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	١	-	٢	٢
Course Type	Compulsory			
Academic level at which the course is taught	**First Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Pro. Mona Yehia Shedid**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Architectural engineering drawings are the language that is used to describe the size and shape of buildings. The course will enable the students to understand and use the architectural drawings language. It is designed to introduce the students the concepts, practices, standards, and drafting techniques needed for architectural design

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٨	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools	CLO١	Identify the basics of structural engineering drawing and implement them into projects.
		CLO٢	Analysis the structural systems of buildings in a simple context, scales and types that meet engineering requirements.
D١	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies and human sciences	CLO٣	Discuss engineering technologies related to systems of building construction.
		CLO٤	Apply construction technologies and materials into different projects.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Presentations
4. Self-learning
5. Hybrid Learning
6. Project
7. Brainstorming

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to course content	3	1	2
2	Preliminary operations lecture for construction operations + The start of the guard room project Plan	٣	1	2
3	A lecture on primary building materials + project completion and drawing of Elevations + Sections	٣	1	2
4	Completion of the pre-construction works lecture + project submission	٣	1	2
5	Discussion of research group No. (١) Construction systems and construction methods (load-bearing and structural walls)	٣	1	2
6	Discussion of research group No. (٢) Types of surface foundations and insulation in installations, Types of deep foundations and insulation in structures	٣	1	2
7	First Exam	٣	1	2
8	Discussion of the research group No. (٣) Brick stacks and bonding methods	٣	1	2
9	Discussion of the research group No. (٤) Stone stacks and bonding methods	٣	1	2
10	Discussion of research group No. (٥) heritage coverage and construction (dome, vault, vault and wood)	٣	1	2
11	Large project presentation and drawing (Plan + Elevations + Sections)	٣	1	2
12	Second Exam	٣	1	2
13	Project Semi-Final Submission	٣	1	2
14	project Final submission	٣	1	2
15	General Discussion	٣	1	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	SEELY, I.H. - Building Technology- Macmillan - London - ١٩٩٥.
	Other References	BARRY, R., The Construction of Buildings, (Vol. I, IV) Ed., Granada Technical Books, London, ١٩٨٠. • CHING, F., Building Construction Illustration, John Wiley, New York, ١٩٩١. • CHUDLEY, R., Construction Technology, 2nd Ed., Essex, England: Longman, ١٩٨٧. • GREENO, Roger, Principles of Construction. - ٢nd Ed., Essex: Longman, ١٩٨٦. • LYONS, Arthur, Materials for architects and Builders, Oxford: Elsevier, ٢٠٢٠. • MCKAY, W.B., Building Construction, (Vol. ١), last Ed., Longman, London. • MC ROVEN, Ch., Building with Stone, Lippincott & Crowell Publishers, New York١٩٨٠. • NASHED, Fred, Time – Saver Details for Exterior wall Design, N.Y.: McGraw-Hill, ١٩٩٦. • NIKOLAS, Davies & JOKINIEMI, Erkki, Dictionary of Architecture and Building Construction, ٢nd Edition. ٢٠٢٠.

	Electronic Sources (Links must be added)	http://www.archnet.org http://www.greatbuilding.com http:// www.architecture.com
	Learning Platforms (Links must be added)	NA
	Other (to be mentioned)	NA
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Pro. Mona Yehia Shedid

Name and Signature
Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Building Construction**			
Course Code (according to the bylaw)	**CMA ١١٠**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	١	٢
Course Type	Compulsory			
Academic level at which the course is taught	**first level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Ahmed Abouelfetouh**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

The course aims to introduce students to the relationship between architectural designs and building components.

It provides a fundamental understanding of how to create the different basic elements of building construction and provides the students with basic knowledge of: Building Construction Stages, Wall bearing and Skeleton Structures, Stone construction, Masonry- raw brick masonry & brick masonry, Stair's detailing, internal and external finishing materials

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٥	Practice research techniques and methods of investigation as an inherent part of learning	**CLO١**	Discuss the different types of both expansion and settlement joints in buildings by scientific research.
		CLO٢	Present information about different finishing materials in buildings.
A٨	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO٣**	Identify the main elements of concrete, steel, and wood structural systems.
		CLO٤	Produce neat drawings for the principal elements and components of concrete, steel, and wood structural systems.
D٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems.	**CLO٥**	Describe the different stair types and their various elements.
		CLO٦	Design the suitable stair type for a specific use.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Project-Based Learning
4. Presentation
5. Discussion
6. Self-Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction & Course Review	3	2	1
2	Brick& stone stacks and bonding methods	3	2	1
3	Pre-Cast Conc. Construction	3	2	1
4	Timber Floors & Roofs Construction	3	2	1
5	Timber Walls & Columns Construction	3	2	1
6	Steel Floors & Roofs Construction	3	2	1
7	First Exam	3	2	1
8	Discussion of ١st research: Different types of both expansion and settlement joints	3	2	1
9	Introduction to RC Stairs	3	2	1
10	Introduction to Cantilevered Staircase Design	3	2	1
11	Introduction to Precast Concrete Stairs	3	2	1
12	Second Exam	3	2	1
13	Introduction to Steel Stair System	3	2	1
14	Discussion of ٢nd research: Different finishing materials in buildings.	3	2	1
15	Physical Model: RC Stair System	3	2	1

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	The Architect's Handbook of Professional Practice, American Institute of Architects, Wiley, 16th Edition,2019
	Other References	McKay, W. B. (2005). Building Construction Metric Vol. I–IV. 4th Ed. Mumbai: Orient Longman. • Ching, Francis D. K. (2019). Architectural Graphics (6th Edition). New Jersey: John Wiley & Sons Inc.
	Electronic Sources (Links must be added)	http:// www.greatbuilding.com http:// www.architecture.com http:// www.archnet.org
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA

for teaching and learning	**Skill Labs/ Simulators**	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Ahmed Abouelfetouh



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Structural Analysis-١**			
Course Code (according to the bylaw)	**CMC ١٠١**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	--	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**First level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Prof. Hala M. Refaat**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Loads and reactions – Stability of structures (external and internal) – Straining actions in Statically determinate structures- Normal stresses – Shear stresses (pure shear, torsional) – Combined stresses. Elastic deflection of determinate structures (double Integration method and virtual work method).

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO١	**Identify** the structures and different types of structural elements, the determinacy and stability of structures
		CLO٢	**Calculate** the structure support reactions
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO٣	**Determine** the internal forces in determinate structural elements using classical methods
		CLO٤	**Study** the stresses on the structure (normal, shear, and combined).
		CLO٥	**Analyze** the elastic deflection of determinate structures

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Hybrid Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Tutorial)
1	Review of Statics Stability of structures	٥	٢	٣
2	Loads and Reactions.	٥	٢	٣
3	Loads and Reactions.	٥	٢	٣
4	Analysis of Determinate Beam.	٥	٢	٣
5	Analysis of Determinate Beam.	٥	٢	٣
6	Analysis of Determinate Frame	٥	٢	٣
7	First Exam			
8	Introduction to stresses (Properties of areas)	٥	٢	٣
9	Normal stresses	٥	٢	٣
10	Shear stresses	٥	٢	٣
11	Principal stresses	٥	٢	٣
12	Second Exam			
13	Elastic deflection of beams	٥	٢	٣
14	Double Integration method	٥	٢	٣
15	virtual work method	٥	٢	٣

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (written)	١٢	٢٠	٢٠
	Student activities (assignment,Quizzes)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	• "Solved Examples in Determinate Structures", DarElmaarefa, Egypt, Dr. Ahmed Youssef Kamal El-Deen, ISBN ٢١٦٣٨/٢٠١٦
	Other References	Structural Analysis by Russell C. Hibbeler, Pearson, ٩th Edition, ٢٠١٤, ISBN-١٣:٩٧٨-٠-١٣-٣٩٤٢٨٤-٢. • George, N. Frantziskonis. "Essentials of the Mechanics of Materials, Second Edition". USA: Destech Publications, Inc. ٢٠١٣. ISBN ١٣: ٩٧٨١٦٠٥٩٥٠٩٨٣ • Pytel, A. and Kiusalaas, J. "Mechanics of Materials Second Edition". Cengage Learning2012. ISBN-١٣: ٩٧٨-٠-٤٩٥-٦٦٧٧٥-٩
	Electronic Sources (Links must be added)	https://byjusexamprep.com/determinate-andindeterminate-structures-i
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students

Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Prof. Hala M. Refaat



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Structural Analysis-2**			
Course Code (according to the bylaw)	**CMC ١٠٢**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	--	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**First level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Ibrahim Elazab**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Analysis of statically indeterminate structures (three-moment equations). Analysis of statically indeterminate structures: Force approach (Consistent deformation method). Displacement approach (Slope deflection Method, Moment distribution method). Introduction to Matrix Structural Analysis for ١-D elements using Stiffness method (Truss, Beam, and frame elements).

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**CLO١**	Identify indeterminate structures
		CLO٢	Describe the Displacement approach
		CLO٣	Explain the Matrix Structural Analysis for ١-D element
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٤**	Analysis of statically indeterminate structures using three -moment equations.
		CLO٥	Evaluate the Displacement for the structure
		CLO٦	Estimate Stiffness for Truss, Beam, and frame elements.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Hybrid Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Tutorial)
1	Introduction to indeterminate structures	٤	٢	٢
2	Three-moment equations	٤	٢	٢
3	Displacement approach	٤	٢	٢
4	Consistent deformation method	٤	٢	٢
5	Slope deflection Method	٤	٢	٢
6	Moment distribution method	٤	٢	٢
7	First Exam	٤	٢	٢
8	Introduction to Matrix Structural Analysis for ١-D	٤	٢	٢
9	Stiffness method for Truss elements	٤	٢	٢
10	Stiffness method for Truss elements	٤	٢	٢
11	Stiffness method for Beam elements	٤	٢	٢
12	Second Exam	٤	٢	٢
13	Stiffness method for Beam elements	٤	٢	٢
14	Stiffness method for frame elements	٤	٢	٢
15	Stiffness method for frame elements	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (written)	١٢	٢٠	٢٠
	Student activities (assignment,Quizzes)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
TOTAL			١٠٠	١٠٠

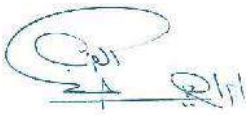
٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	• "Solved Examples in Determinate Structures", DarElmaarefa, Egypt, Dr. Ahmed Youssef Kamal El-Deen, ISBN ٢١٦٣٨/٢٠١٦
	Other References	Structural Analysis by Russell C. Hibbeler, Pearson, ٩th Edition, ٢٠١٤, ISBN-١٣:٩٧٨-٠-١٣-٣٩٤٢٨٤-٢. • George, N. Frantziskonis. "Essentials of the Mechanics of Materials, Second Edition". USA: Destech Publications, Inc. ٢٠١٣. ISBN ١٣: ٩٧٨١٦٠٥٩٥٠٩٨٣ • Pytel, A. and Kiusalaas, J. "Mechanics of Materials Second Edition". Cengage Learning2012. ISBN-١٣: ٩٧٨-٠-٤٩٥-٦٦٧٧٥-٩
	Electronic Sources (Links must be added)	https://byjusexamprep.com/determinate-andindeterminate-structures-i

	Learning Platforms (Links must be added)	Welcome! - Thingi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Ibrahim Ali El-Azab



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Properties and Testing of Construction Materials**			
Course Code (according to the bylaw)	**CMC ١٠٣**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	١	٢
Course Type	Compulsory			
Academic level at which the course is taught	**First Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mostafa Omar**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies

Stress and strain - Types of tests - Testing machines - Strain gauge devices - Static tension test - Static compression test - Bending test - Shear test - Torsion test - Hardness test - Fatigue test - Impact test - Metals creep test.

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٢	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	**CLO١**	Identify mechanical, physical, and chemical properties of engineering materials
		CLO٢	Explain stress-strain behavior, strength, ductility, toughness, and resilience lines
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٣**	Determine the mechanical properties of engineering materials under tension, compression, bending, shear and torsion tests
		CLO٤	Discuss the mechanical properties of engineering materials under impact, fatigue and hardness tests

٣. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Practical-Based Learning
4. Discussion

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Stress and strain	3	2	1
2		3	2	1
3	Types of tests	3	2	1
4	Testing machines	3	2	1
5	Strain gauge devices	3	2	1
٦	Static tension test	3	2	1
٧	First exam	3	2	1
٨	Static compression test	3	2	1
٩	Bending test	3	2	1
١٠	Bending test	3	2	1
١١	Shear test	3	2	1
١٢	Second Exam	3	2	1
١٣	Torsion test	3	2	1
14	Hardness test, Fatigue test	3	2	1
15	Impact test, Metals creep test	3	2	1

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٤. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	١st Midterm Exam (Semester work)	٧th	٣٠	٣٠ %
٢	٢nd Midterm Exam (Semester work)	١٢th	٣٠	٣٠ %
٣	Final Written Exam	١٦th	٤٠	٤٠ %
٤	Student activities (assignment)	throughout semester	١٠	١٠ %

٥. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Engineering Materials: Properties and Selection by Kenneth G. Budinski, Pearson, 9th Edition, 2017
	Electronic Sources (Links must be added)	https://www.ekb.eg https://mffeci.ekb.eg/linkresolver/openurl/v•,١ https://byjusexamprep.com/mechanical-properties-ofengineering-materials-i https://mffeci.ekb.eg/linkresolver/openurl/v0.1 Egyptian Knowledge Bank
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mostafa Omar



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Construction Materials and Concrete Technology**			
Course Code (according to the bylaw)	**CMC ١٠٤**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	١	٣
Course Type	Compulsory			
Academic level at which the course is taught	**First Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mostafa Omer**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in following fields: Introduction to concrete technology – Mixing water – Concrete manufacture – Properties of fresh concrete – Properties of hardened concrete - Durability of concrete – Permeability, thermal properties, and elasticity of concrete – Shrinkage and creep of concrete – Concrete mix design, admixtures – Introduction to fiber reinforced polymers - Non-destructive testing - Special concretes.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٢	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.	**CLO١**	**Identify** properties of types and construction materials and how to test them.
		CLO٢	Conduct appropriate experimentation for aggregate types, cement, and concrete
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics	**CLO٣**	Determine concrete mix components and asphalt concrete mix components.
		CLO٤	Solve engineering problems in the process of the properties of construction materials and account for concrete mix and asphalt concrete components.
		CLO٥	Discuss properties of fresh concrete, hardened and special concrete, and durability of concrete
		CLO٦	Explain fiber-reinforced polymers, steel in construction, insulation materials, coatings, Nondestructive testing, and asphalt cement

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials

3. Practical-Based Learning
4. Discussion

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to Concrete Technology	5	2	3
2	Mixing Water	5	2	3
3	Concrete manufacture	5	2	3
4	Properties of fresh concrete	5	2	3
5	Properties of hardened concrete	5	2	3
6	Durability of concrete	5	2	3
7	Permeability, thermal properties, and elasticity of concrete	5	2	3
8	Shrinkage and creep of concrete	5	2	3
9	Concrete mix design	5	2	3
10	Introduction to fiber reinforced polymers	5	2	3
11	Density, Travel Time and Delay Studies	5	2	3
12	Non-destructive testing	5	2	3
13	Special concretes	5	2	3
14	Admixtures	5	2	3
15	Destructive testing	5	2	3

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠

٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Construction Materials, Methods and Techniques by William P.Spence, Delmar CengageLearning, ٤th Edition, ٢٠١٦.
	Other References	Egyptian Knowledge Bank)
	Electronic Sources (Links must be added)	• https://structuralengineeringbasics.com/what-types-ofconstruction-building-materials/ • https://08122ce4x-1103-y-https-iopscience-ioporg.mplbci.ekb.eg/article/10.1088/1742-6596/1378/2/022058
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mostafa Omer

Name and Signature
Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Surveying for Engineers-١**			
Course Code (according to the bylaw)	**CMC ١٠٥**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	١	٣
Course Type	Compulsory			
Academic level at which the course is taught	**First level (Level ١-١)**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Ahmed Elhadary**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course covers principles of plane surveying; distance measurements (Optical, Electronic), angle and direction measurements; traverse computations; Coordinate systems for engineering works, setting out horizontal and vertical curves; earthwork computation; setting out engineering structures and construction projects; levelling (theory, methods, and equipment). Prerequisite: Integration & Multivariable functions (FRB٠٠٢).

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٢	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.	**CLO١**	Apply the fundamental concepts of using surveying instruments in survey and setting out.
A٧	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**CLO٢**	Use different survey instruments (tap, theodolite, and level) efficiently as a member of a working group in engineering projects.
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٣**	Identify the basic principles of a plane and topographic survey.
		CLO٤	Determine horizontal and vertical angles, horizontal distance, and reduced level of points.
		CLO٥	Calculate the coordinates of the traverse, adjust it, and solve the intersection and resection problems.
		CLO٦	**Predict** the area and volume of the project.
		CLO٧	**Apply** the techniques of survey and setting out for curves

٤. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Practical-Based Learning
٤. Co-operative Learning
٥. Problem-based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to Surveying	٥	٢	٣
٢	Angular Measurement and Theodolite	٥	٢	٣
٣	Distance measurements	٥	٢	٣
٤	Traversing computation and adjustment	٥	٢	٣
٥	Levelling method	٥	٢	٣
٦	Earthwork computation	٥	٢	٣
٧	First Exam (Week ٧) / Areas and Volumes Computation	٥	٢	٣
٨	Horizontal curve	٥	٢	٣
٩	Vertical curve	٥	٢	٣
١٠	Setting out engineering structures and construction projects	٥	٢	٣
١١	Lab: Distance measurements	٥	٢	٣
١٢	Second Exam (Week ١٢) /	٥	٢	٣
١٣	Lab: Theodolite parts and calibration	٥	٢	٣
١٤	Lab: Total station parts & software / Coordinates by Total Station	٥	٢	٣
١٥	Lab: Survey levelling / Lay out by Total Station / Experimental Test	٥	٢	٣

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	Experimental Exam (Practical)	١٢	٢٠	٢٠
	Discussion (٥٪) / Observation (٣٪) / Mini-Project (٢٪)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Formative Total		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Surveying for Civil and Mine Engineers Theory, Workshops, and Practicals - John Walker, Joseph L. Awange - ٢٠١٨ - ISBN ٩٧٨-٣-٣١٩-٥٣١٢٨-١
	Other References	Elementary Surveying - An Introduction to Geomatics - Thirteenth Edition - ٢٠١٣ - CHARLES D. GHILANI. Surveying Engineering & Instruments - Valeria Shank - First Edition - ٢٠١٣.
	Electronic Sources (Links must be added)	https://www.lawinsider.com/dictionary/survey-plan https://٠٨١٠ole٦z-١١٠٥-y-https-www-webofscience-com.mplbci.ekb.eg/
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Lecturer Notes
Supportive facilities & equipment for teaching	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA

and learning	**Other** (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Ahmed Elhadary



Name and Signature
Head of Department

Dr. Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Construction Engineers Drawing**			
Course Code (according to the bylaw)	**CMC ١٠٦**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	١	٣	-	٢
Course Type	Compulsory			
Academic level at which the course is taught	**First level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Amr R. Elgamal**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in two fields: first is BIM, which includes: Introduction to BIM in Autodesk Revit. Model creation, view creation, in Revit. Geometrical Constructions: two-dimensional drawing, sketching for creating solid models. **Second is Solid Modeling:** Introduction to solid Modeling in Autodesk Inventor, creating solid models of structures in the Autodesk Inventor environment. Creating orthographic views from a solid model in AutoCAD.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٨	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO١**	Use the skills and have the knowledge to take a project from start to finish using the tools and library provided
B٢	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.	**CLO٢**	Illustrate the interface to help them navigate in Autodesk Revit.
		CLO٣	Discuss the fundamentals of 2-D and 3-D dimensional drawing and sketching for creating solid models.
		CLO٤	Create ٢D and ٣D representations, renderings, and basic documentation by using Autodesk Revit projects

٤. Teaching and Learning Methods

١. Lecture
٢. Interactive Learning
٣. Computer-Based instruction

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to BIM and Construction Management.	٤	١	٣
٢	Introduction to BIM and Construction Management.	٤	١	٣
٣	Conceptual Drawings and Projection System	٤	١	٣
٤	Conceptual Drawings and Projection system	٤	١	٣
٥	Discuss the fundamentals of Architectural Plan, Elevation and Section of a Simple Building	٤	١	٣
٦	Discuss the fundamentals of Architectural Plan, Elevation and Section of a Simple Building	٤	١	٣
٧	First Practical Exam	٤	١	٣
٨	Structural Details of a Simple Building	٤	١	٣
٩	Structural Details of a Simple Building	٤	١	٣
١٠	Draw plan and elevation views of a building	٤	١	٣
١١	Draw plan and elevation views of a building	٤	١	٣
١٢	Second Practical exam	٤	١	٣
١٣	Skills to produce solid models of objects.	٤	١	٣
١٤	Skills to produce solid models of objects.	٤	١	٣
١٥	Create solid models of objects.	٤	١	٣

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (Practical I)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam (Practical)**	١٢	٢٠	٢٠

٣	Assignment, Report, Quizzes	Throughout semester	٧	٧
٤	Mini-Projects	١٥	٣	٣
٥	Final Exam (Practical)	١٦	٤٠	٤٠
Summative Assessment Method				
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	A Textbook of Engineering Drawing: Along with an Introduction to AutoCAD, International Publishing House, ٢٠١٥ .ISBN ٩٧٨٩٣٨٤٥٨٨٦٨٧.
	Other References	BIM and Construction Management: Proven Methods, and Workflows. Hardin and ,Tools . Wiley ٢٠١٥,McCool, ٢nd edition
	Electronic Sources (Links must be added)	http:// www.greatbuilding.com http:// www.architecture.com http:// www.archnet.org
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	Computer Lab
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Amr R. Elgamal



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Surveying for Engineers-٢**			
Course Code (according to the bylaw)	**CMC ١٠٨**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**First level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Ahmed Elhadary**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Prerequisite: Surveying for Engineers-١ (CMC ١٠٥).

Introduction to geodesy; Coordinate systems, Map projections, GNSS system concepts and characteristics, signal structure, receivers and antennae; GNSS measurements, GNSS time, error sources and accuracy measurement; position determination techniques - Errors Reduction Techniques, single-point and differential positioning, static and kinematic GNSS, postprocessing and Real-time processing, DGNSS concepts.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٥	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO١**	Practice research techniques on the map projection.
		CLO٢	Apply the methods of investigation in DGNSS concepts.
B١	Select appropriate and sustainable technologies for the 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.	**CLO٣**	Identify the concepts and theories of Geodesy and Global Navigation Satellite System.
		CLO٤	Discuss the basic principles of different coordinate systems on the ellipsoid.
		CLO٥	Analyze the results of geodetic observations using numerical models and calculate their accuracy.
		CLO٦	**Evaluate** the different Position determination techniques by Global Navigation Satellite System.
		CLO٧	**Use** suitable software to solve the problems of determining 3-D position on and near the surface of the Earth

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials

3. Report
4. Computer-based Instruction
5. Problem-based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to geodesy	4	2	2
2	Coordinate systems	4	2	2
3	Map projections (Part ١)	4	2	2
4	Map projections (Part ٢)	4	2	2
5	GNSS system concepts, characteristics, signal structure, receivers and antennae	4	2	2
6	GNSS measurements	4	2	2
7	First Exam / GNSS time and error sources	4	2	2
8	Position determination techniques (Part ١)	4	2	2
9	Position determination techniques (Part ٢)	4	2	2
10	Errors Reduction Techniques	4	2	2
11	Single point and differential positioning	4	2	2
12	Second Exam / Static and Kinematic GNSS	4	2	2
13	Postprocessing and Real-time processing	4	2	2
14	DGNSS concepts (Part ١)	4	2	2
15	DGNSS concepts (Part ٢) /	4	2	2
16	Final Exam			

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	First Exam (Written)	٧	٣٠	٣٠
٢	Second Exam (Written)	١٢	٢٠	٢٠
	Report (٢٪) / Presentation (٣٪) / Assignments (٣٪) / Discussion (٢٪)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Formative Total		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Surveying and geomatics engineering, principles, technologies and applications. Surveying committee. 2022 - ISBN 978-0-7844-1603-7
	Other References	• Elementary surveying - An introduction to geomatics by Ghilani C.D., Wolf P.R., PH ٢٠١١. • PRECISION SURVEYING: The Principles and Geomatics Practice - John O. Ogundare - ٢٠١٥. • Geodesy - Introduction to Geodetic Datum and Geodetic Systems - Zhiping Lu et al. - ٢٠١٤. • ENGINEERING SATELLITE-BASED NAVIGATION AND TIMING - John W. Betz - ٢٠١٦.
	Electronic Sources (Links must be added)	https://desktop.arcgis.com/en/arcmap/latest/map/projections/transverse-mercator.htm https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS

	Other (to be mentioned)	Lecturer Notes
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Ahmed Elhadary



Name and Signature
Head of Department

Dr. Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Fluid Mechanics**			
Course Code (according to the bylaw)	**CMC ١٠٩**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	١	٠	٢
Course Type	Compulsory			
Academic level at which the course is taught	**First Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr/ Amir Sabery Mohamed**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with fundamental knowledge and understanding of fluid mechanics principles, including dimensions and units, fluid properties, fluid statics (pressure distribution, pressure measurements, and forces on submerged surfaces), buoyancy and flotation, fluids in relative equilibrium, fluid kinematics, fluid dynamics with applications of Bernoulli's equation, impulse–momentum principles, and flow in pipes and pipe systems.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO١	Identify the basic principles of fluid mechanics and flow in pipes.
		CLO٢	Apply civil Engineering processes for flow in open channels and pipeline systems.
A٢	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.	CLO٣	Conduct laboratory tests on hydraulic laboratory.
		CLO٤	Work efficiently in groups to assess the experimental data tests by comparing them with the available fluid mechanics equations.
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics	CLO٥	Use different techniques of fluid mechanics, for solving civil engineering problems.
		CLO٦	Solve fluid flow problems using Mass, Energy and Momentum equations

٤. Teaching and Learning Methods

١. Lecture
٢. Practical-Based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction & Dimensions and Units	3	2	1
٢	Properties of liquids	3	2	1
٣	Fluid statics and pressure measurements	3	2	1
٤	Forces on Submerged Surface	3	2	1
٥	Buoyancy and Floatation	3	2	1
٦	Fluids in Relative Equilibrium	3	2	1
٧	Types of flow	3	2	1
٨	Continuity equation	3	2	1
٩	Bernoulli's equation	3	2	1
١٠	Flow through orifices	3	2	1
١١	Momentum equation	3	2	1
١٢	Flow in pipes and losses	3	2	1
١٣	Available online software packages to solve flow problems	3	2	1
١٤	Available online software packages to solve flow problems	3	2	1
١٥	Available online software packages to solve flow problems	3	2	1

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam (practical + Oral)**	١٢	٢٠	٢٠
	Student activities (assignment, report)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠

Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• A Brief Introduction to Fluid Mechanics, sixth Edition by Donald F. Young, Bruce R. Munson, Theodore H. Okiishi, Wade W. Huebsch, Wiley ٢٠١٠, IS ٠٤٧٠٥٩٦٧٩١, ٩٧٨٠٤٧٠٥٩٦٧٩١. • A Brief Introduction to Fluid Mechanics by Hochstein, John I., and Andrew L. Gerhart. Young, Munson and Okiishi's. John Wiley & Sons, ٢٠٢١. ISBN: ٩٧٨-١-١١٩-٦١١١٧-٢. • E. Shashi Menon, "Liquid Pipeline Hydraulics", Marcel Dekker, ٢٠٠٤.
	Other References	• Fundamentals of Fluid Mechanics, Bruce R. Munson, Donald F. Young, Theodore H. Okiishi, and Wade W. Huebsch, Wiley co., SI Version, ٦th Edition, ٢٠١٠,. • ISBN: ٩٧٨-٠-٤٧٠-٣٩٨٨١-٤
	Electronic Sources (Links must be added)	https://www.ekb.eg https://www.youtube.com/watch?v=96XaYmaHg6A&ab_channel=GetAClass-Physics https://www.youtube.com/watch?v=eKEorBipbO8&ab_channel=GetAClass-Physics
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	,Solving Problems in Fluid Mechanics, volume ١& ٢, J.F.Douglas ,Longman Scientific and Technical, Longman Group UK Ltd .Longman House, Burnt Mill, Harlow, Essex CM٢٠ ٢JE, England
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator

Dr Amir Sabery

Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification -٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Hydraulics for Construction Engineers**			
Course Code (according to the bylaw)	**CMC ١١٢**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	١	٠	٢
Course Type	Compulsory			
Academic level at which the course is taught	**First Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr/ Amir Sabery Mohamed**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Pr.Req.: Fluid Mechanics (CMC١٠٩)

This course aims to provide students with fundamental knowledge and understanding of Hydraulics for Construction Engineers principles, including Basic Principles (open channel flow) - Uniform Flow (Basic equations for steady uniform flow - Velocity and shear stress distributions in open channels) – Non-Uniform Flow (Specific energy - Hydraulics of channel bed transition) - Hydraulic Jumps - Gradually Varied Flow - Open Channel Design (Rigid boundary and erodible channel) - Dimensional analysis and Similarity (Methods of dimensional analysis - Model analysis and similarity) – Hydraulics Machinery (Pumps and Turbines).

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٢	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	CLO١	Investigate fundamental principles of hydraulics through experimentation
		CLO٢	Discuss experimental readings through working in teams.
A٣	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	CLO٣	Solve complex problems in hydraulics
		CLO٤	Design of canal and drain cross section
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics	CLO٥	Acquire the skills for dimensional analysis and similitude.
		CLO٦	Predict the operating characteristics of pumps and the factors affecting their operation, performance, and efficiency

٤. Teaching and Learning Methods

١. Lecture
٢. Practical-Based Learning
٣. Reports

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Open channel flow	3	2	1
٢	Uniform Flow	3	2	1
٣	Velocity distributions in open channels	3	2	1
٤	Shear stress distributions in open channels	3	2	1
٥	Specific energy- Hydraulics transition	3	2	1
٦	Hydraulic Jumps	3	2	1
٧	Gradually Varied Flow	3	2	1
٨	Open Channel Design	3	2	1
٩	Open Channel Design	3	2	1
١٠	Dimensional analysis	3	2	1
١١	Model analysis and similarity	3	2	1
١٢	Hydraulics Machinery	3	2	1
١٣	Hydraulics Machinery	3	2	1
١٤	Available online software packages to solve flow problems	3	2	1
١٥	Available online software packages to solve flow problems	3	2	1

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam (practical + Oral)**	١٢	٢٠	٢٠
	Student activities (assignment, report)	**Throughout semester**	١٠	١٠

٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Chadwick, A., Morfett, J. and Borthwick, M. (٢٠٢١), Hydraulics in Civil and Environmental Engineering, ٦th Edn., Published June ٨, ٢٠٢١, by CRC Press. ISBN ٩٧٨٠٣٦٧٤٦٠٨٩١.
	Other References	• Wynn P. (٢٠١٤), Hydraulics for Civil Engineers by, ICE Publishing. First Edition. ISBN-١٣: ٩٧٨-٠٧٢٧٧٥٨٤٥٣.
	Electronic Sources (Links must be added)	https://www.ekb.eg Journal of Hydraulic Engineering, ASCE https://www.youtube.com/watch?v=bY0PJgnITTI&ab_channel=GerardaMaryShields
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	,Solving Problems in Fluid Mechanics, volume ١& ٢, J.F.Douglas ,Longman Scientific and Technical, Longman Group UK Ltd .Longman House, Burnt Mill, Harlow, Essex CM٢٠ ٢JE, England
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	Laboratory Usage
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Dr Amir Sabery

Program Coordinator
Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Engineering Differential Equations**			
Course Code (according to the bylaw)	**FRB ١٠١**			
Department/s participating in delivery of the course	**Basic Engineering Science Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	**Compulsory**			
Academic level at which the course is taught	**First Level**			
Academic Program	**Construction Engineering and Management Program**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Mahmoud Khattab**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Pre. Req.: Integration and multivariable functions

Basic Concepts of Ordinary and Partial Differential Equations (ODEs & PDEs): Order, Degree, Linearity, Formation, Geometric and physical applications (Newton's law of cooling, electric circuits), Types of solutions, Existence and uniqueness of solutions.

ODEs: Solution of first-order ODEs (Separable, Homogeneous, Exact, Integrating factor, Linear and Bernoulli equations). Orthogonal trajectories. Solution of nth order ODEs (homogeneous and non-homogeneous). System of first-order linear differential equations. Laplace transforms and inverse Laplace transforms with applications. Fourier series with applications. Gamma and Beta functions

PDEs: Solution of linear PDEs with constant coefficients, solution of some initial boundary value problems. Solution of PDEs by Laplace Transforms.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO١	Identify the basic items of the course.
		CLO٢	Explain how to use all items of the course in applied engineering problems
A٢	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.	CLO٣	Solve different problems for various mathematical elements
		CLO٤	Analyze different problems and verifications.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussion

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Order, Degree, Linearity, Formation, Geometric and physical applications – Part ١	٤	٢	٢
2	Order, Degree, Linearity, Formation, Geometric and physical applications – Part ٢	٤	٢	٢
3	Solution of first-order ODEs – Part ١	٤	٢	٢
4	Solution of first order ODEs – Part ٢	٤	٢	٢
5	Orthogonal trajectories. Solution of nth order ODEs (homogeneous and non-homogeneous) – Part ١	٤	٢	٢
6	Orthogonal trajectories. Solution of nth order ODEs (homogeneous and non-homogeneous) – Part ٢	٤	٢	٢
7	First Mid-Term Exam	٤	٢	٢
8	System of first order linear differential equations – Part ١	٤	٢	٢
9	System of first order linear differential equations – Part ٢	٤	٢	٢
10	Fourier series with applications	٤	٢	٢
11	Gamma and Beta functions	٤	٢	٢
12	Second Mid-Term Exam	٤	٢	٢
13	Solution of linear PDEs with constant coefficients.	٤	٢	٢
14	Solution of PDEs by Laplace Transforms	٤	٢	٢
15	Revision	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	Exam ١written (Semester work)	٧th	٣٠	٣٠٪
٢	Exam ٢written (Semester work)	١٣th	٣٠	٣٠٪
٣	Final Written Exam	١٦th	٤٠	٤٠٪
٤	Quizzes	٦th,٩th	٥	٥%
٥	Discussions	٥th ,١٤Th	٥	٥%

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Hsu, Sze-Bi, and Kuo-Chang Chen. Ordinary differential equations with applications. Vol. ٣٤. World scientific, ٢٠٢٢.
	Other References	Tenenbaum, Morris, and Harry Pollard. Ordinary differential equations: an elementary textbook for students of mathematics, engineering, and the sciences. Courier Corporation, ١٩٨٥.
	Electronic Sources (Links must be added)	https://mathinsight.org/ordinary_differential_equation_introduction https://www.ekb.eg
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Mahmoud Khattab



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Water Chemistry**			
Course Code (according to the bylaw)	**FRB ١٠٢**			
Department/s participating in delivery of the course	**Basic Engineering Science Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	0	٣
Course Type	Compulsory			
Academic level at which the course is taught	**First Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mona Eletr**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide an introduction to equilibrium chemistry principles in aquatic systems. This course is designed for engineering students who are often required to understand the composition of solutions and the direction of changes during treatment or in environmental systems. By completion of the course, the student will be able to interpret and communicate results related to water quality. Therefore, the course syllabus includes the following topics: equilibrium principles of acids-bases, dissolution-precipitation, titration, gas-liquid equilibrium, oxidation-reduction, complexation, and water quality analysis and quality control.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and applied mathematics	COL١	Discuss acid and base reactions, precipitation /dissolution, and complexing
		COL٢	Illustrate the carbonate buffer system, and the impact for aquatic chemistry in general
A ٣	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.	COL٣	Use the basic analytical methods in water chemistry.
A ٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO٤	Explain the effects of speciation on the availability and toxicity of selected ions

٤. Teaching and Learning Methods

1. Lecture
2. Practical-based Learning

3. Interactive Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to water properties, solute properties, and natural water compositions	4	٢	2
2	Acids and Bases: carbonate system, log C vs pH diagrams	4	٢	2
3	Chemical kinetics	4	٢	2
4	Reaction rates	4	٢	2
5	Principles and applications for chemical equilibrium in aquatic systems	4	٢	2
6	Chemical reaction and chemical equilibrium, and conservation of mass	4	٢	2
7	First Exam	4	٢	2
8	Titration, alkalinity and acidity	4	٢	2
9	Gas-liquid equilibrium and effect on alkalinity	4	٢	2
10	Precipitation/dissolution and water softening	4	٢	2
11	Oxidation-reduction reactions	4	٢	2
12	Experimental Exam	4	٢	2
13	Complexation and water quality analysis and quality control	4	٢	2
14	Experimental exam	4	٢	2
15	Experimental exam	4	٢	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST **Mid-term exam (written)**	٧	٣٠	٣٠

٣	**Practical exam**	١٤	٣٠	٣٠
	Student activities (assignment, report)	**10&9&5&3&2**	١٠	١٠
٥	**Final Exam (Written)**	١٥	٤٠	٤٠
Summative Assessment Method				
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Lecturer Notes. - Patrick L. Brezonik (Author), William A. Arnold, Water Chemistry: The Chemical Processes and Composition of Natural and Engineered Aquatic Systems ٢nd Edition, ٢٠٢٢
	Other References	Sawyer, McCarty & Parkin, Chemistry for Environmental Engineering, McGraw Hill, 2003
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Stumm & Morgan, aquatic Chemistry. Third .edition, John Wiley & Sons. ١٩٩٥
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	-
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator

Dr Mona Eletr

Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Environmental pollution and industrial safety**			
Course Code (according to the bylaw)	**FRB ١٠٣**			
Department/s participating in delivery of the course	**Construction Engineering and Management**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	1	0	٢
Course Type	Compulsory			
Academic level at which the course is taught	**First level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Ass. Prof. Sherine Awad**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course includes Air pollution - Adverse effects - Ozone depletion - Greenhouse effects - Acid rain and global warming - Measurement and control methods.
Water pollution - Constituents of wastewater - Primary treatment: various pre-treatment methods - Advanced treatment: chemical oxidation, precipitation, air stripping
Construction Engineering and Management students: Plan and manage construction health and safety, maintain safety issues for construction to introduce the foundations on which appropriate health and safety systems may be built. Occupational health and safety affects all aspects of work. Legal framework for health and safety

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	COL١	Describe the primary treatment: various pre-treatment methods. Advanced Treatment: chemical oxidation, precipitation, air stripping for water pollutants.
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.	COL٢	Discuss air pollution sources and ways for control and adverse effects
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	CLO٣	Demonstrate the nature and sources of water pollution and advanced treatment
		CLO٤	Demonstrate the general safety issues for construction. Introduce the foundations on which appropriate health and safety systems may be built

٤. Teaching and Learning Methods

١- Lecture
٢. Practical-based learning
٣. Discussion session
٤. Extra lectures
٥. Provide different levels of books and materials

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to environmental engineering, Environmental Impact Assessment, different types of environmental pollution, characteristics of wastewater.	٣	٢	١
2		٣	٢	١
3	Primary treatment: various pre-treatment methods,	٣	٢	١
4	Advanced wastewater treatment: chemical oxidation, precipitation, air stripping	٣	٢	١
5		٣	٢	١
6	Occupational health and safety affect all aspects of work. Legal framework for health and safety.	٣	٢	١
7	First Exam			
8	Nature and sources of air pollution	٣	٢	١
9	Ozone depletion - greenhouse effects - Acid rain and global warming: measurement and control methods. Plan and manage construction health and safety.	٣	٢	١
10		٣	٢	١
11		٣	٢	١
12	Experimental Exam			
13	Maintain safety issues for construction. Introduce the foundations on which appropriate health and safety systems may be built.	٣	٢	١
14		٣	٢	١
15		٣	٢	١
16	Final Exam			

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				

١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical)	١٢	٢٠	٢٠
	Student activities (assignment, report, Quizzes)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Peavy, Rowe and Tchobangolous "Environmental Engineering" McGraw Hill. Handbook of "Industrial Safety and Health", Trade and Technical Press Ltd., Morden, U.K. ١٩٨٠. S.P. Mahajan, "Pollution Control in Process Industries" Tata McGraw Hill, New Delhi ١٩٨٥
	Other References	Jeremy Colls, "Air Pollution", second edition, by Spon Press ٢٠١٢
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Lecture hall
	Supplies	White board
	Electronic Programs	Data show
	Skill Labs/ Simulators	Laboratory usage
	Virtual Labs	NA
	Other (to be mentioned)	NA

Name and Signature
Course Coordinator

Ass. Prof. Sherine Awad



Name and Signature
Program Coordinator

Dr Ahmed Gamal



Second Level Courses Specifications

Compulsory Courses

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Introduction to City Planning**			
Course Code (according to the bylaw)	**CMA ٢١٠**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	١	٢
Course Type	Compulsory			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Ayman M. Zakaria**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

The course aims to provide an introduction to understanding the theoretical and practical skills of planning, its components, and problems by providing a historical and critical look. The course also aims to raise students' awareness of urban issues and problems. Throughout the course, students will also become familiar with land use and spatial/physical components of the built environment

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٦	Plan, supervise, and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO١	Identify the different theories and concepts that shape the cities.
		CLO٢	Analyze different elements of urban form to obtain design criteria.
		CLO٣	Apply the urban planning concepts in a selected area.
D١	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and human sciences	CLO٤	Analyze site & different factors affecting planning problem solutions
		CLO٥	Choose appropriate solutions for planning problems based on analytical thinking
D٢	Generate ecologically responsible, environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems	CLO٦	Analyze city planning theories in urban spaces while having adequate knowledge of environmental conservation.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Project- based learning
4. Report

5. Discussion Session
6. Extra Lectures
7. Provide different levels of books and materials

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Course Introduction	3	2	1
2	Introduction to City Planning	3	2	1
3	History of City Planning	3	2	1
4	City Planning Theory	3	2	1
5	Urban Tissue	3	2	1
6	Urban Form	3	2	1
7	First Exam	3	2	1
8	City Structure	3	2	1
9	The neighborhood: A Residential Environment	3	2	1
10	SWOT Analysis	3	2	1
11	Urban Planning Process	3	2	1
12	Second Exam	3	2	1
13	Introduction to project	3	2	1
14	Similar project analysis	3	2	1
15	Final sketch & presentation	3	2	1

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
٣	Student activities (Mini-Project , report)	Throughout semester	١٠	١٠
٤	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				

٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	إشكالية النسيج والطابع، نسمات عبد القادر، سيد ١٩٩٧an Planning by Jordan Yin, W. Paul Farmer, التوني، Dummies, ١ Edition, ٢٠١٢
	Other References	Time Saver Standards for Housing and Residential Development by Joseph De Chiara, Julius Panero, Martin Zelnik, ٢٠١٧. How to Study Public Life, Jan Gehl, Birgitte Svarre, ٢٠١٣.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Ayman M. Zakria

ayman m zakaria

Name and Signature
Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Hydrology and water resources**			
Course Code (according to the bylaw)	**CMC ٢٠١**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	-	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Ahmed Abouelfetouh**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in

Introduction to water balance and hydrological cycle, Precipitation, Evaporation, Transpiration, Infiltration, Runoff, Hydrograph. Stream flow measurements, Hydrograph analysis, flood routing, storage operations. Hydrology of the Nile basin, Nile water resources. Major projects constructed on the River Nile and suggested storage projects. Water problems in Egypt, water scarcity, water resources in Egypt, Renewable Water Resources, conventional resources, and non-conventional water resources. Principles of water resources assessment. Economics and assessment principles of water projects.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. .	**CLO١**	**Identify** hydrological components like precipitation, evaporation, infiltration, and runoff.
		CLO٢	**Solve** practical problems in surface hydrology and groundwater hydrology
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٣**	**Use** computer programs related to hydrology science and applications
		CLO٤	**Analyze** in quantitative terms the processes of water resources and hydrology for solving civil engineering problems
B٢	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	**CLO٥**	**Apply** suitable solutions to the water Resources problem through teamwork.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.	CLO٦	**Write** reports on water resources projects in Egypt.

٤. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Reports
٤. Practical-Based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Hydrological Cycle	4	٢	2
٢	Precipataion	4	٢	2
٣	Evaporation	4	٢	2
٤	Infiltration	4	٢	2
٥	Runoff	4	٢	2
٦	Hydrograph	4	٢	2
٧	First Exam	4	٢	2
٨	Hydrology of the nile basin	4	٢	2
٩	Nile water resources	4	٢	2
١٠	Major projects on the nile river	4	٢	2
١١	Water scarcity	4	٢	2
١٢	Second Exam	4	٢	2
١٣	Water resources in Egypt	4	٢	2

١٤	Conventional and non-conventional water resources	4	٢	2
١٥	Economics and assement principles of water projects	4	٢	2

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	V	٣٠	٣٠
٢	٢ND Mid-term exam (Experimental + Oral)	١٢	٢٠	٢٠
	Student activities (Quiz, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Mays LW, A. (٢٠٢١), Ground and surface water hydrology. Published June ٨, ٢٠٢١, by John Wiley & Sons Inc Press. ISBN ٩٧٨٠٤٧٠١٦٩٨٧-٢.
	Other References	Egyptian Codes for irrigation.
	Electronic Sources (Links must be added)	https://www.ekb.eg WW.WWC.NCRS.USDA.GOV Journal of Hydrology. Elsevier B.V. https://www.sciencedirect.com/journal/journal-ofhydrology.
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students

Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Ahmed Abouelfetouh



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Transportation and Traffic Engineering**			
Course Code (according to the bylaw)	**CMC ٢٠٢**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	١	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Ahmed Gamal Mahmoud Morsi**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in two fields: first is transportation planning, which includes: Introduction to transportation planning - Study area - Transportation planning surveys - Travel demand forecasting (Trip generation - Trip distribution - Modal split (Mode Choice) - Traffic assignment) - Transportation evaluation. **Second is Traffic Engineering:** Introduction (Road user characteristics - Vehicle characteristics) - Traffic volume - Traffic speed - Traffic density - Travel time and delay studies - Traffic Flow characteristics - Parking studies - Traffic control devices - Intersection control - Traffic signal design.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	CLO١	Identify transportation problem
A٢	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.	CLO٢	Analyz the data collected which is required for planning
A٥	Practice research techniques and methods of investigation as an inherent part of learning	CLO٣	Practice research techniques in evaluating transportation project
B٢	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.	CLO٤	Design of traffic signal
B٣	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.	CLO٥	Manage traffic flow

٤. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Practical-Based Learning
٤. Self-learning
٥. Hybrid Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to Transportation Planning	٥	٢	٣
٢	Define Study Area & Data Collection	٥	٢	٣
٣	Trip Generation	٥	٢	٣
٤	Trip Distribution	٥	٢	٣
٥	Modal Split - Traffic Assignment	٥	٢	٣
٦	Transportation Evaluation	٥	٢	٣
٧	Human Characteristics	٥	٢	٣
٨	Vehicle Characteristics	٥	٢	٣
٩	Volume Studies	٥	٢	٣
١٠	Speed Studies	٥	٢	٣
١١	Density, Travel Time and Delay Studies	٥	٢	٣
١٢	Traffic Flow Characteristics	٥	٢	٣
١٣	Parking Studies	٥	٢	٣
١٤	Traffic Control Devices and Intersection Control	٥	٢	٣
١٥	Traffic Signals Design	٥	٢	٣

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Nicholas Garber, Lester Hoel, Traffic and Highway Engineering, Fifth Enhanced SI Edition, CENGAG Learning, ٢٠٢٠.
	Other References	Egyptian Codes for Highways.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Ahmed Gamal



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Soil Mechanics**			
Course Code (according to the bylaw)	**CMC ٢٠٣**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	١	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mohamed Gamal Elabd**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in these fields, which includes: Introduction to Geotechnical Engineering - Definitions and Relationships - Index Properties of Soil - Soil Classification Systems (Unified – British) - Permeability and Seepage of Soil (Darcy's Law - Capillarity in Soils - Flow Net Analysis) - Stress Distribution in Soil (Point load – Uniform Load (Newmark – Fadum - Approximation)) - Shear Strength of Soil (Direct Shear Box - Triaxial– Unconfined Compression) - Lateral Earth Pressure (Active and Passive) - Soil Compaction (Standard Proctor - Modified Proctor).

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	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.	**CLO١**	Analyze the index properties of soils and soil classification of the different types of soils
A٢		**CLO٢**	Determine the soil permeability coefficient due to variable permeability tests.
		CLO٣	Calculate the soil shear parameters due to variable shear tests.
A٥	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO٤**	Use research techniques for staking out of engineering works, such as soil classification.
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics ,Hydrology and Fluid Mechanics	**CLO٥**	Evaluate the variable soil parameters according to the knowledge of soil properties and classifications and soil seepage.
		CLO٦	Evaluate the stresses on soil due to different loads and the shear strength of a soil mass and soil compaction factor and lateral Earth pressure coefficient.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Practical Based Learning
4. Report

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to Geotechnical Engineering	5	2	3
2	Definitions and relationships	5	2	3
3	Index properties of soil	5	2	3
4	Soil classification	5	2	3
5	Soil classification	5	2	3
6	Permeability and Seepage	5	2	3
7	Flow Net Analysis	5	2	3
8	Stress Distribution in Soil	5	2	3
9	Stress Distribution in Soil	5	2	3
10	Shear strength of Soil	5	2	3
11	Shear strength of Soil	5	2	3
12	Shear strength of Soil	5	2	3
13	Soil compaction	5	2	3
14	Soil compaction	5	2	3
15	Lateral earth pressure	5	2	3

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠

	Student activities (assignment, report)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Das, B.M., "Principles of Geotechnical Engineering", 25th Ed., SI Edition Co., 2020, ISBN-10:0-495-41132-9, ISBN-13: 978-0-495-41132-1. -Das, B.M., "Principles of Foundation Engineering", 10th Ed., PWS Publishing Co., 2019, ISBN: 81-7008-081-9. - "Egyptian Code of Practice for Soil Mechanics, Design and Construction of foundations, Parts 1, 2 and 3, Housing and Building Research Center, Cairo, 2020. - El-Kasaby, E. A., Soil Mechanics, Dar Al-Kutub Al-Almia, Cairo, 5th Ed., (21371/2013), ISBN 978 – 977 – 726 – 041 – 1, 2014. - Das, B. M, Soil Mechanics Laboratory Manual, Oxford University Press, 9th. Ed., ISBN 978 – 019 – 020 – 966 – 7, 2016 .
	Other References	Egyptian Codes for soil mechanics.
	Electronic Sources (Links must be added)	https://www.ekb.eg • https://www.kau.edu.sa/Files/0001553/files/SoilMechBook.pdf • https://www.sciencedirect.com/topics/agricultural-andbiological-sciences/soil-structure • https://byjus.com/biology/soil-profile/
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mohamed Gamal



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Geotechnical Engineering Foundations**			
Course Code (according to the bylaw)	**CMC ٢٠٤**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Lab**	**Tutorial**	**Total**
	٢	٢	١	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mona Ibrahim**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills and attitudes which includes: Soil Consolidation and Settlement (Soil Consolidation Theory- Primary and Secondary Settlement - Oedometer Test) - Bearing Capacity of Soil (Terzaghi Eq. - Mayerhof Eq. - Egyptian Code Eq.) - Shallow Foundations (Construction Considerations – Design Considerations) - Design of Isolated Footings (Square and Rectangular Footings Footing with Moment) - Design of Strip Footings - Design of Combined Footings - Design of Strap Beam Footings — Design of Rafts (Conventional Method — Ribbed Raft).

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٢	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.	CLO١	Compute Soil Consolidation, Settlement and evaluate findings using statistical analyses.
		CLO٢	Determine Bearing Capacity of Soil and conduct appropriate experimentation and/or simulation, analyze and interpret data.
A٣	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.	CLO٣	Apply construction considerations and design considerations to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental aspects.
		CLO٤	Design Shallow Foundations 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.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO٥	Specify appropriate and sustainable technologies for the construction of Isolated Footings (Square and Rectangular Footings – Footing with Moment).
		CLO٦	Design of Strip Footings and Combined Footings by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying.
B٢	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.	CLO٧	Design an optimum design of Strap Beam Footings.
		CLO٨	Design an optimum design of Rafts (Conventional Method – Ribbed Raft

٤. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Practical Based Learning
٤. Discussion
٥. Problem Based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Soil Consolidation and Settlement (Soil Consolidation Theory, Primary Settlement).	٥	٢	٣
٢	Soil Consolidation and Settlement (Secondary Settlement, Oedometer Test).	٥	٢	٣
٣	Bearing Capacity of Soil (Terzaghi Eq. .).	٥	٢	٣
٤	Bearing Capacity of Soil (Mayerhof Eq. – Egyptian Code Eq.).	٥	٢	٣
٥	Shallow Foundations (Construction Considerations).	٥	٢	٣
٦	Shallow Foundations (Design Considerations).	٥	٢	٣
٧	First Exam	٥	٢	٣
٨	Design of Isolated Footings (Square and Rectangular Footings).	٥	٢	٣
٩	Design of Isolated Footings (Footing with Moment).	٥	٢	٣
١٠	Design of Strip Footings.	٥	٢	٣
١١	Design of Combined Footings.	٥	٢	٣
١٢	Experimental test	٥	٢	٣
١٣	Design of Strap Beam Footings.	٥	٢	٣
١٤	Design of Rafts (Conventional Method).	٥	٢	٣
١٥	Design of Rafts (Ribbed Method).	٥	٢	٣

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	- Das, B.M., *Principles of Geotechnical Engineering*, ٢٥th Ed., SI Edition Co., ٢٠٢٠, ISBN-١٠: ٠-٤٩٥-٤١١٣٢-٩, ISBN-١٣: ٩٧٨-٠-٤٩٥-٤١١٣٢-١. - *Egyptian Code of Practice for Soil Mechanics, Design and Construction of Foundations*, Parts ١, ٢ and ٣, Housing and Building Research Center, Cairo, ٢٠٢٠. - Das, B.M., *Principles of Foundation Engineering*, ١٠th Ed., PWS Publishing Co., ٢٠١٩, ISBN: ٨١-٧٠٠٨-٠٨١-٩. El-Kasaby, E. A., Soil Mechanics, Dar Al-Kutub Al-Almia, Cairo, ٥th Ed., (٢١٣٧١/٢٠١٣), ISBN ٩٧٨ – ٩٧٧ – ٧٢٦ – ٠٤١ – ١, ٢٠١٤.
	Other References	Egyptian Codes for Foundations.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://www.geoengineer.org/?utm_source=chatgpt.com
	Learning Platforms (Links must be added)	**Welcome! - Thingi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mona Ibrahim



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	Design of Metallic Structures-١			
Course Code (according to the bylaw)	**CMC ٢٠٥**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Ibrahim M. El-Shenawy**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Steel as a construction material - Material properties and steel sections - Allowable Stress Design method - Design of tension members - Design of compression members - Columns in braced and unbraced frames - Design of flexural members - Types and classification of beam cross sections - Design of laterally supported and unsupported beams - Design of beam-columns (axial and flexural forces) - Design of bolted connections - Design of welded connections.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Learning Outcomes (NARS/ARS) According to the matrix in the program specs		Course Learning Outcomes Upon completion of the course, the student will be able to,	
Code	**Text**	**Code**	**Text**
A ٣	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.	CLO١	Apply specified considerations to planning the steel structure.
		CLO٢	Apply different loads and structural analysis of steel structures.
A ٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO٣	Derive the safety of actual stresses by comparing it by allowable stresses of codes and standards of steel structures.
		CLO٤	Derive safety requirements (serviceability & deflection) by compare it by limits of codes and standards of steel structures.
B ٢	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	CLO٥	Determine the critical straining action for elements.
D ٢	Generate ecologically responsible environmental conservation and rehabilitation designs, through an understanding of structural design, construction, technology, and engineering problems	CLO٦	Design of Steel Structure elements achieving an optimum design. By the end of this lesson, the student will be able to design the Structure steel structural elements.

Σ. Teaching and Learning Methods

1. Lecture
2. Tutorials

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Steel as a construction material – Material properties and steel sections	4	2	2
2	Allowable Stress Design method - Design of tension members	4	2	2
3	Design of compression members - Columns in braced and unbraced frames	4	2	2
4	Design of compression members - Columns in braced and unbraced frames	4	2	2
5	Types and classification of beam cross sections - Design of flexural members	4	2	2
6	Design of laterally supported beams	4	2	2
7	First Exam	4	2	2
8	Design of laterally unsupported beams	4	2	2
9	Design of laterally unsupported beams	4	2	2
10	Design of beam columns (axial and flexural forces)	4	2	2
11	Design of bolted connections (bearing type)	4	2	2
12	Second Exam	4	2	2
13	Design of bolted connections (friction type)	4	2	2
14	Design of bolted connections (friction type)	4	2	2
15	Design of welded connections	4	2	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	- Advanced Steel Design of Structures, by Prof. Srinivasan Chandrasekaran, Indian Institute of Technology, India. ISBN-١٣ ٩٧٨٠٣٦٧٢٣٢٩٠٠ - Steel Designers' Manual, by (Steel Construction Institute), Edited by Buick Davison and Graham W. Owens, ISBN-١٣ ٩٧٨١١١٩٢٤٩٨٦٣ - Steel design handbook by. Prof Dr. Bahaa M. Mashaly Part ١. Seventh Edition, ISBN: ٩٧٧-٢٢٣-٥٤٩-٨. - Design of Metallic Structures, EHAB ELLOBODY, RAN FENG, BEN YOUNG, ٢٠١٤, ISBN: ٩٧٨-٠-١٢-٤١٦٥٦١-٨
	Other References	- Egyptian code for design of steel structure.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA

and learning	**Virtual Labs**	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Ibrahim M. El-Shenawy



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Construction Project Management**			
Course Code (according to the bylaw)	**CMC ٢٠٦**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Wafaa Arandah**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Introduction to construction project management, need for project management, project definition, project life cycle, project success factors, key roles and tasks of construction project participants, construction project organizational structure, the project team, project site management, preparation of construction method, safety and health roles in construction projects.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ٦	Plan, supervise, and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO ١	Use the theory and application of the time, cost, and quality triangle.
		CLO٢	Identify key elements of the project management lifecycle and its practical application.
A ٧	Function efficiently as an individual and as a member of multidisciplinary and multicultural teams.	CLO٣	Recognize the importance of people management in construction project management as a member of multi-disciplinary and multi-cultural teams.
A ٩	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO٤	Analyze, evaluate and produce project documentation.
		CLO٥	Describe key elements of the planning and development framework.
B ٣	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.	CLO ٦	Plan for project risks using defined risk assessment processes.
		CLO ٧	Discuss a project management plan articulating how a given project is to be executed, including breaking down the project into manageable tasks.
B ٤	Deal with bidding, contracts and financial issues including project insurance and guarantees.	CLO ٨	Communicate professionally and effectively through written and graphical means.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Project-based Learning
4. Interactive Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Intro. to Const. Management, Project Lifecycle and Safety	٤	٢	٢
٢	Project Def., Objectives, Project Success Factors	٤	٢	٢
٣	Method Statements, Project stakeholders	٤	٢	٢
٤	Construction method: Site works and below ground structures	٤	٢	٢
٥	Analysis of Construction productivity	٤	٢	٢
٦	Analysis of Construction productivity	٤	٢	٢
٧	Midterm Exam ١	-	-	-
٨	Contract strategy for Construction project.	٤	٢	٢
٩	Key elements of the planning	٤	٢	٢
١٠	Key elements of the planning	٤	٢	٢
١١	Construction Quality and safety management	٤	٢	٢
١٢	Midterm Exam ٢	-	-	-
١٣	Closing and commissioning	٤	٢	٢
١٤	Closing and commissioning	٤	٢	٢
١٥	FINAL REVISION	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Paul Netscher "Construction Management: From Project Concept to Completion" CreateSpace Independent Publishing Platform (October ٢٠١٧), ISBN-١٠: ١٩٧٥٩٣٤٣٤٣, ISBN١٣: ٩٧٨-١٩٧٥٩٣٤٣٤٧
	Other References	Stephens W. Nunnally, Construction Methods and Management, ٨th Edition, Pearson (٢٠١١), ISBN ٩٧٨-٠١٣٢٤٥٤٣٦٠
	Electronic Sources (Links must be added)	https://www.ekb.eg https://www.projectmanager.com/guides/constructionproject-management.
	Learning Platforms (Links must be added)	Welcome! - Thingi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator



Dr Wafaa Arandah

Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	Design of R.C. Structures-١			
Course Code (according to the bylaw)	**CMC ٢٠٧**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	0	2	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in Design of R.C. Structures: Properties of concrete materials - Ultimate limit states design method - Design of sections under pure bending moment (Rectangular, L & T - sections) - Load distribution – Design of section under shear – Design simple and continuous beams - Design of one-way and two-way solid slabs - Design of hollow block slabs - Design of panelled beams.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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.	**CLO١**	Apply the methods of design according to the standard code.
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO٢**	Use the code to design sections subjected to flexure and shear.
B٢	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.	**CLO٣**	Verify the serviceability conditions and limit states.
		CLO٤	Design the different reinforced concrete structural elements according to ECP.
D٢	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of structural design, construction, technology, and engineering problems associated with building designs.	**CLO٥**	Apply the principles for designing slabs and beams.
		CLO٦	Make the reinforcement details and draw the full structure details.

Σ. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussion
4. Presentation
5. Problem-based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Tutorial)
1	Introduction to Reinforced Concrete	4	2	2
2	Properties of concrete materials.	4	2	2
3	Ultimate limit states design method	4	2	2
4	Design of sections under pure bending moment (Rectangular)	4	2	2
5	Design of sections under pure bending moment (L &T - sections)	4	2	2
6	Continue the design of sections under pure bending moment (L &T - sections)	4	2	2
7	Load distribution	4	2	2
8	Design of a section under shear	4	2	2
9	Design simple beams	4	2	2
10	Design continuous beams	4	2	2
11	Continue Design continuous beams	4	2	2
12	Design of one-way and two-way solid slabs	4	2	2
13	Design of hollow block slabs	4	2	2
14	Design of paneled beams	4	2	2
15	Continue Design of paneled beams	4	2	2

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (written)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

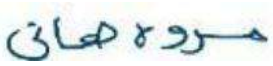
٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	• Design of Reinforced Concrete by Jack C. McCormac, Russell H. Brown, Wiley, Fifth Edition, ٢٠١٤ • Design of Concrete Structures, Arthur H Nilson, D.Darwin, Charles W. Fifteenth Edition,٢٠١٦. • Design of reinforced concrete structures, Mashhour Ghoneim, Mahmoud Elmihilmy, Volume I, second edition, ٢٠١٢. • Design of reinforced concrete structures, Mashhour Ghoneim, Mahmoud Elmihilmy, Volume ٢, Third edition, ٢٠١٢. • Fundamentals of Reinforcement Concrete and Prestressed concrete, M.Hilal, ١٩٨٧. .
	Other References	• Shaker Elbehary handbook. • Egyptian Code for Design & Construction of Reinforced Concrete Structures – ECOP ٢٠٣-٢٠١٨.
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS

	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Marwa Hany Bondok



Name and Signature
Program Coordinator

Dr. Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	Design of R.C. Structures-٢			
Course Code (according to the bylaw)	**CMC ٢٠٨**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	0	2	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in Design of R.C. Structures: Design of flat slabs - Design of sections subjected to bending moment and axial force - Analysis and design of columns – Design of RC frames -Design of Sections under Torsion- Serviceability limit states (deflection - crack width).

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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.	**CLO١**	Apply the methods of design according to the standard code.
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO٢**	Use the code to design sections subjected to flexure and shear.
B٢	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.	**CLO٣**	Analyze the different RC structure elements.
		CLO٤	Design the different reinforced concrete structural elements according to ECP.
D٢	Generate ecologically responsible, environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems associated with building designs.	**CLO٥**	Apply the principles for designing slabs and beams.
		CLO٦	Make the reinforcement details and draw the full structure details.

Σ. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussion
4. Presentation
5. Problem-based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Tutorial)
1	Design of flat slabs	4	2	2
2	Continuing Design of flat slabs	4	2	2
3	Design of sections subjected to bending moment and axial force	4	2	2
4	Continuing Design of sections subjected to bending moment and axial force	4	2	2
5	Analysis and design of columns	4	2	2
6	Continue Analysis and design of columns	4	2	2
7	Design of RC frames	4	2	2
8	Design of RC frames	4	2	2
9	Design of Sections under Torsion	4	2	2
10	Design of Sections under Torsion	4	2	2
11	Continuing Design of Sections under Torsion	4	2	2
12	Serviceability limit states (deflection - crack width)	4	2	2
13	Continuing Serviceability limit states (deflection - crack width)	4	2	2
14	Continuing Serviceability limit states (deflection - crack width)	4	2	2
15	Continuing Serviceability limit states (deflection - crack width)	4	2	2

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (written)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	• Design of Reinforced Concrete by Jack C. McCormac, Russell H. Brown, Wiley, Fifth Edition, ٢٠١٤ • Design of Concrete Structures, Arthur H Nilson, D.Darwin, Charles W. Fifteenth Edition,٢٠١٦. • Design of reinforced concrete structures, Mashhour Ghoneim, Mahmoud Elmihilmy, Volume I, second edition, ٢٠١٢. • Design of reinforced concrete structures, Mashhour Ghoneim, Mahmoud Elmihilmy, Volume ٢, Third edition, ٢٠١٢. • Fundamentals of Reinforcement Concrete and Prestressed concrete, M.Hilal, ١٩٨٧. .
	Other References	• Shaker Elbehary handbook. • Egyptian Code for Design & Construction of Reinforced Concrete Structures – ECOP ٢٠٣-٢٠١٨.
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thingi MICROSOFT TEAMS

	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Marwa Hany Bondok



Name and Signature
Program Coordinator

Dr. Ahmed Gamal



Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Engineering Numerical Analysis**			
Course Code (according to the bylaw)	**FRB ١٠٤**			
Program/s participating in delivery of the course	**Basic Engineering Science Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	٢	٢	-	٣
Course Type	**Compulsory**			
Academic level at which the course is taught	**Second Level**			
Academic Program	**Construction Engineering and Management Program**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Mahmoud Khalaf**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (**461**) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Pre. Req.: Ordinary and Differential Equations (CEB ١١١)

Numeric in General: Solution of linear systems by iterative methods (Jacobi Iteration, Gauss–Seidel Iteration Method, Convergence and Matrix Norms). Solution of nonlinear equations (Fixed-Point Iteration, Newton–Raphson's method, Sufficient Convergence Condition). Curve fitting (Least square method). Interpolations (Lagrange Interpolation, Newton's Forward and Backward Interpolations). Numerical differentiation. Numerical integration (Rectangular Rule, Trapezoidal Rule, Simpson's Rule).
Numeric for ODEs and PDEs: Solution of first-order ODEs (Euler's method, Runge– Kutta Methods). Solution of higher order ODEs. Boundary and initial-boundary value problems for ODEs, Elliptic and parabolic PDEs (Finite difference methods, Explicit method, Crank–Nicolson Method). Lab simulations of engineering applications.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO١	**Identify** the basic items of the course.
		CLO٢	**Explain** how to use all items of the course in applied engineering problems
A ٢	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.	CLO٣	**Solve** different problems for various mathematics elements
		CLO٤	**Analyze** the different problems and verifications.

٤. Teaching and Learning Methods

١. Lectures
٢. Discussion
٣. Lab Simulations
4. Computer-based Instruction

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Tutorial)
1	Introduction & Errors: Numerical methods overview Types of errors and accuracy	4	2	2
2	Nonlinear Equations: Bisection Method Fixed-Point Iteration	4	2	2
3	Nonlinear Equations: Newton Raphson	4	2	2
4	Linear Systems: Jacobi Iteration Method Gauss–Seidel Method	4	2	2
5	Curve Fitting	4	2	2
6	Interpolation: Lagrange interpolation Newton devided difference	4	2	2
7	**First Mid-Term Exam**	4	2	2
8	Numerical Differentiation Finite difference formulas	4	2	2
9	Numerical Integration: Trapezoidal rule Simpson's rule	4	2	2
10	ODEs I: Euler method Runge–Kutta methods	4	2	2
11	ODEs II: Euler method Runge–Kutta methods	4	2	2
12	PDEs & Applications: Finite difference methods Explicit method Crank–Nicolson method	4	2	2
13	PDEs & Applications: Boundary & initial-boundary value problems Lab simulations (engineering applications)	4	2	2
14	**Practical Exam**	4	2	2
15	Revision	4	2	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	First Mid-Term Exam	٧th	٣٠	٣٠٪
٢	Practical Exam	١٤th	٢٠	٢٠٪
٣	Final Written Exam	١٦th	٤٠	٤٠٪
٤	Quizzes	٦th, ١٣Th	١٠	١٠%

٦. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	-R W Hamming, "Numerical Methods for Scientists and Engineers", Courier Dover Publications, Last Edition. -van Kan, J. J. I. M., August Segal, and Fredericus Johannes Vermolen. "Numerical methods in scientific computing." (2023). -Yang, Won Y., et al. *Applied numerical methods using MATLAB*. John Wiley & Sons, 2020.
	Other References	-Steven C. Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, Mcgraw-Hill, ٣rd edition. -Nita H. Shah, Numerical Methods with C++ Programming, PHI Learning, ٢٠٠٨.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://archive.org/details/numerical-methodas-forengineers-and-scientists https://www.youtube.com/watch?v=IOR31yN43Kg&list=PLDea8VeK4MUTOBXLpvx_WKtVrMkojEh5
	Learning Platforms (Links must be added)	**Welcome! - Thingi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	Data Show System Sound System
	Supplies	NA
	Electronic Programs	Ibn-El-Haitham System
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Mahmoud Khalaf



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Applied Engineering Probability and Mathematical Statistics**			
Course Code (according to the bylaw)	**FRB ٢٠١**			
Department/s participating in delivery of the course	**Civil Engineering Department / Basic Sciences**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	٠	٣
Course Type: Compulsory	**Compulsory**			
Academic level at which the course is taught	**Fall Semester (Level ٢-١)**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Assoc. Prof. Wageda Ibrahim Shaban**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** ٧/١٠/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** ١٨/١١/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Probability: Basic Theorems of Probability. Conditional Probability. Independent Events. Discrete and Continuous Random Variables. Mean and Variance of Distributions. Discrete Distributions (Binomial, Poisson and Hypergeometric Distribution). Continuous Distributions (Normal and Exponential Distribution). Distributions of Several Random Variables (Discrete and Continuous Two-Dimensional Distributions).
Mathematical Statistics: Random Sampling. Sample meaning and variance. Point Estimation of Parameters. Confidence Intervals. Simple and multiple Linear Regression and Correlation. Testing of Hypotheses. Markov chains. Quality Control. Engineering Applications. Lab simulations of engineering applications.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and applied mathematics.	CLO١	Identify the basic items of the course.
A٢	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and engineering objective judgment to draw conclusions.	CLO٢	Explain how to use all items of the course in applied engineering problems.
		CLO٣	Solve different problems for various mathematics elements.
		CLO٤	Analyze the different problems and verifications.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussions
4. Report
5. Brainstorming

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Theoretical Teaching	Training
١	Basic Theorems of Probability.	٤	٢	٢
٢	Basic Theorems of Probability.	٤	٢	٢
٣	Conditional Probability. Independent Events.	٤	٢	٢
٤	Discrete and Continuous Random Variables. Mean and Variance of Distributions.	٤	٢	٢
٥	Discrete Distributions (Binomial, Poisson and Hypergeometric Distribution)	٤	٢	٢
٦	Discrete Distributions (Binomial, Poisson and Hypergeometric Distribution)	٤	٢	٢
٧	First Mid-Term Exam	٤	٢	٢
٨	Continuous Distributions (Normal and Exponential Distribution).	٤	٢	٢
٩	Continuous Distributions (Normal and Exponential Distribution).	٤	٢	٢
١٠	Distributions of Several Random Variables (Discrete and Continuous Two-Dimensional Distributions).	٤	٢	٢
١١	Random Sampling. Sample mean and variance.	٤	٢	٢
١٢	Second Mid-Term Exam	٤	٢	٢
١٣	Point Estimation of Parameters. Confidence Intervals.	٤	٢	٢
١٤	Testing of Hypotheses.	٤	٢	٢
١٥	Engineering Applications.	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠

	Student activities (assignment, report)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	R. E. Walpole, R. H. Myers, 'Probability and Statistics for Engineers and Scientists', Macmillan Publishing, Last Edition.
	Other References	David Levine, Patricia Ramsey, Robert Smidt, 'Applied Statistics for Engineers and Scientists: Using Microsoft Excel & Minitab', First Edition, ٢٠٠٠.
	Electronic Sources (Links must be added)	https://archive.org/details/introductiontopr٤th٠٠mend_d٦h٢
	Learning Platforms (Links must be added)	MICROSOFT TEAMS / Thinqi
	Other (to be mentioned)	Course Notes (PowerPoint slides) available in electronic form for students.
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	White Board
	Electronic Programs	Lab simulations of engineering applications
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	Lecture Hall

Name and Signature

Course Coordinator

Assoc. Prof. Wageda Ibrahim Shaban



Name and Signature

Program Coordinator

. Dr Ahmed Gamal



Humanities Elective Courses

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Principles of Entrepreneurship and Project Management**			
Course Code (according to the bylaw)	**UHS ٢٠١**			
Department/s participating in delivery of the course	**Construction Engineering and Management**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٠	٢
Course Type	Electives			
Academic level at which the course is taught	**Second level**			
Academic Program	**Bachelor of engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Concepts in entrepreneurship – entrepreneurship and small enterprises – Idea generation of entrepreneurial projects – The university and entrepreneurship opportunities and challenges – Marketing plan – operational plan – financial plan – Writing the business plan – The technological environment for entrepreneurship projects – External business environment for pioneering projects – Egyptian economy programs to support leading projects – entrepreneurial project presentation skills – Introduction to project management – The organizational structure –Success assessment – Planning – data reading – network planning – critical path analysis of networks – resource allocation and constraints – cost management – risk management – measurement and control of project performance.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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. .	CLO١	Perform the market needs for innovative entrepreneurial projects that incorporate sustainable design principles.
			Implement cost effective solutions for entrepreneurial projects.
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles	CLO٢	Use cutting-edge technologies and industry standards in executing entrepreneurial projects.
			Identify risk management principles into entrepreneurial planning to project success and environmental sustainability.

٤. Teaching and Learning Methods

١. Lecture
٢. discussion
٣. brainstorming
٤. problem based learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Market Analysis and Opportunity Identification	٢	٢	٠
٢	Idea Generation and Validation Techniques	٢	٢	٠
٣	Sustainable Design Principles for Entrepreneurship	٢	٢	٠
٤	Financial Planning and Cost Management for Startups	٢	٢	٠
٥	Ethical Considerations in Business Development	٢	٢	٠
٦	Market Analysis and Opportunity Identification	٢	٢	٠
٧	Market Analysis and Opportunity Identification	٢	٢	٠
٨	Operational Planning and Project Management	٢	٢	٠
٩	Operational Planning and Project Management	٢	٢	٠
١٠	Technology Adoption and Risk Management for Entrepreneurs	٢	٢	٠
١١	Technology Adoption and Risk Management for Entrepreneurs	٢	٢	٠
١٢	Second Exam	٢	٢	٠
١٣	Entrepreneurial Business Plan Development	٢	٢	٠
١٤	Entrepreneurial Business Plan Development	٢	٢	٠
١٥	Pitching and Presentation Skills for Entrepreneurs	٢	٢	٠

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠

٢	٢ND Mid-term exam (practical + Oral)	١٢	٣٠	٣٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Alexander Osterwalder, Yves Pigneur, "Business model generation: A handbook for visionaries, game changers, and challengers", 1st edition, 2010, ISBN-١٣ : ٩٧٨ ٠٤٧٠٨٧٦٤١١
	Other References	Eric Ries, "The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses", 1st edition, 2011, ISBN-١٣ : ٩٧٨-٠٣٠٧٨٨٧٨٩٤
	Electronic Sources (Links must be added)	https://www.ekb.eg /https://designthinking.ideo.com
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Marwa Hany Bondok

Name and Signature
Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Human Resources Management**			
Course Code (according to the bylaw)	**UHS ٢٠٣**			
Department/s participating in delivery of the course	**Electrical Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٠	٢
Course Type	**Electives**			
Academic level at which the course is taught	**Second Level**			
Academic Program	**Bachelor of engineering (Construction Engineering and Management Program)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Tamer Omar Mohamed Diab**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes: The concept of human resources management – The historical development of human resource management – the main jobs of human resource management – planning for human resources – obtaining human resources – training and developing human resources – compensation for human resources – maintaining and sustaining human resources.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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.	CLO١	Solve issues for human resource issues through case studies and brainstorming
		CLO٢	Use career paths for employment for the quality life work, Through effective evaluation of employee performance
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO٣	Model the basics of human resource management such as strategies, policies, and executive.
		CLO٤	Identify the nature of human resource Outsourcing services.

٤. Teaching and Learning Methods

١. Lecture
٢. Report
٣. Self-learning
٤. Hybrid Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Strategic Human Resource Management.	٢	2	٠
2	Human Resource Practices.	٢	2	٠
3	Career Path Planning and Development.	٢	2	٠
4	Employee Performance Appraisal.	٢	2	٠
5	Strategic Human Resource Management.	٢	2	٠
6	Human Resource Practices.	٢	2	٠
7	**١st Exam**			
8	Outsourcing Human Resource Services.	٢	2	٠
8	Outsourcing Human Resource Services.	٢	2	٠
10	Electronic Human Resource Management.	٢	2	٠
11	Electronic Human Resource Management.	٢	2	٠
12	**٣nd Exam**			
13	Talent Management.	٢	2	٠
14	Quality of Work Life	٢	2	٠
15	Quality of Work Life	٢	2	٠
16	**Final Exam**			

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam**	١٢	٢٠	٢٠
٣	**Student activities (Report)**	**Throughout semester**	١٠	١٠
٤	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	د. مروة محمد عبد الحميد ، إدارة الموارد البشرية الاستراتيجية : مدخل لادارة المواهب وجودة الحياة الوظيفية ، المؤلف، القاهرة، 2022م
	Other References	أ.د. أحمد سيد مصطفى ، إدارة الموارد البشرية: الإدارة العصرية لرأس المال الفكرى، المؤلف، القاهرة، 2005م
	Electronic Sources (Links must be added)	
	Learning Platforms (Links must be added)	**ZOOM Workplace**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Tamer Omar



Name and Signature
Program Coordinator

Dr Ahmed Gamal



Third Level Courses Specifications

Compulsory Courses

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Technical Installations in Buildings**			
Course Code (according to the bylaw)	**CMM ٣٠١**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	١	٣	--	٢
Course Type	Compulsory			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Fawzy Ahmed Mohamed**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in two fields: first is Thermal Comfort Heating, which includes Ventilation & Air Conditioning. (HVAC), Central heating and cooling Systems, Distribution Media, and Delivery Devices. Heat and Moisture Transfer in Buildings, Lighting, on-site power generation, and Normal electrical systems. **Second is Water supply and Fire protection systems:** Water supply and drainage systems, types of fixtures, private sewerage systems, Fire protection systems, Architectural acoustics.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٢	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.	**CLO١**	**Present** the elementary subsystems found in different air-conditioning systems, such as air distribution systems, chilled-water circuits for central air-conditioning systems, and refrigerant piping systems for refrigeration plants.
A٣	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.	**CLO٢**	**Demonstrate** the parameters affecting the performance of the installation building to propose improvements.
A٥	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO٣**	**Present** the basic principles and concepts of electrical and mechanical installations in buildings as an inherent part of learning.
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and testing by applying a full range of civil engineering concepts and techniques of Structural Analysis and Mechanics, Properties and Strength of	**CLO٤**	**Perform** appropriate calculations for the construction of electrical and mechanical installations, using either numerical techniques or physical measurements.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics		
D٢	Generate ecologically responsible, environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems.	**CLO٥**	**Develop** different air conditioning systems and equipment to be designed and selected during the AC system design stages.
		CLO٦	**Design** and construction of electrical and mechanical installations in building engineering techniques and project management skills with proficiency aided by modern tools.

٤. Teaching and Learning Methods

1. Lecture
2. Computer-based Learning
3. Discussion
4. Report

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to the Power Distribution System	4	1	3
2	Electrical load estimation	4	1	3
3	Circuit breaker, Generator, and transformer I	4	1	3
4	Circuit breaker, Generator, and transformer II	4	1	3
5	Cables	4	1	3
6	Lighting	4	1	3
7	Introduction to Air Conditioning Systems Cables, Lighting	4	1	3
8	Classification of Air Conditioning Systems I	4	1	3
9	Classification of Air Conditioning Systems II	4	1	3

10	All Air Systems and Air side equipment	4	1	3
11	Air Conditioning Systems load estimation I	4	1	3
12	Air Conditioning Systems load estimation II	4	1	3
13	Basic parts of the fire-fighting systems	4	1	3
14	Waterside Equipment	4	1	3
15	Fire-fighting systems and Equipment	4	1	3

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical)	١٢	٢٠	٢٠
	Student activities (Oral, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Brian Scaddan: "Electrical Installation Work" tenth Edition,٢٠٢٢ • ASHARE, HVAC Systems and Equipment Handbook, ٢٠٢٠.
	Other References	• Building Technology: Mechanical and Electrical Systems- Architecture by Benjamin Stein, John Wiley & Sons, ٢٠١٠. • Basic Refrigeration and Air Conditioning by Ananthanarayanan, McGraw Hill, ٢٠١٣.
	Electronic Sources (Links must be added)	https://www.ekb.eg

	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form to students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	Laboratory
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Fawzy Ahmed



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Sanitary Engineering**			
Course Code (according to the bylaw)	**CMC ٣٠٢**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	١	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mahmoud Hamdy Badawy**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in the fundamentals of water and wastewater engineering. The course covers sources of pollution, water resources and their characteristics, water quality, water collection works, water purification works, water distribution works, sewer systems, wastewater characteristics, wastewater treatment works, wastewater disposal works, treated wastewater reuse, and industrial wastes.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٢	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.	**CLO١**	Discuss the concepts of environmental pollution, Water resources, and water characteristics
B٢	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.	**CLO٢**	Apply knowledge of environmental impact assessment, sustainability, and water consumption.
		CLO٣	Design of Water collection works, Water purification works, and Wastewater treatment works.
		CLO٤	Use different methods for planning Water distribution works and Sewer systems.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussion

4. Practical-Based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to Environmental Engineering	٥	٢	٣
2	Water Quality	٥	٢	٣
3	Water Supply (Population and Water Consumption)	٥	٢	٣
4	Collection Works for Surface Water	٥	٢	٣
5	Sedimentation	٥	٢	٣
6	Sedimentation	٥	٢	٣
7	Disinfection	٥	٢	٣
8	Water Storage	٥	٢	٣
9	Design of Water Distribution Systems	٥	٢	٣
10	Design of Water Distribution Systems	٥	٢	٣
11	Experimental Tests	٥	٢	٣
12	Sewer Systems	٥	٢	٣
13	Wastewater Treatment	٥	٢	٣
14	Wastewater Disposal	٥	٢	٣
15	Course Review and Integrated Design Applications	٥	٢	٣

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

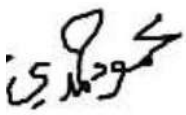
No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam (practical + Oral)**	١٢	٢٠	٢٠
	Student activities (assignment, report)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Sanitary Engineering Prof. Mohamed Basiouny (2019) • Pollution & society Prof. Mohamed Basiouny (2019) • Water and Wastewater Technology: Pearson New International Edition ISBN-13: 9781292021041 • Introduction to Environmental Engineering by Mackenzie Davis, David Cornwell, McGrawHill, Fifth Edition, 2012.
	Other References	• شبكات المياه - الكود المصرى • محطات تنقية مياه الشرب - الكود المصرى • محطات الرفع - الصرف الصحى- الكود المصرى • أعمال المعالجة- الصرف الصحى - الكود المصرى
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mahmoud Hamdy Badawy



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Methods and Equipment for Construction**			
Course Code (according to the bylaw)	**CMC ٣٠٣**			
Department/s participating in delivery of the course	**Construction Engineering and Management Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Third level (Level ٣-١)**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Ahmed Saied Faheim El-Saaey**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/**٢٠٢٥** **Approved in the Faculty Board Meeting Number (461) on** 18/11/**٢٠٢٥**			

٢. Course Overview (Brief summary of scientific content)

Pr.Req.: Design of R.C. Structures-١ (CMC ٢٠٧)

This course covers techniques of building construction, methods, materials, tools, and equipment of construction. It includes traditional, mechanized, and prefabrication construction systems. The course focuses on the selection of construction equipment, applications on the influence of construction methods on design and details, and the evaluation and selection of appropriate construction technology. It also covers sizing, operation, and maintenance of construction equipment, and design of temporary construction elements such as concrete formwork, scaffolding systems, and cofferdams, as well as types of cranes.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٥	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO١**	Apply knowledge of mathematics, science, and engineering to evaluation of equipment and methods for construction of projects.
A٦	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO٢**	Identify the selection of equipment and methods for construction of projects.
B١	Select appropriate and sustainable technologies for the 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.	**CLO٣**	Apply engineering fundamentals and analyses to the planning, selection, and utilization of construction equipment. Through understanding of: The total construction process, from inspection of the idea through construction and start-up.
		CLO٤	Select the most cost-effective manner to produce the intended quality.

٤. Teaching and Learning Methods

١. Lectures
٢. Tutorials
٣. Discussions

٤. Presentation
٥. Report

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Engineering fundamentals of moving earth.	٤	٢	٢
٢	Earth-moving equipment-Backhoe, ...	٤	٢	٢
٣	Earth-compacting equipment-Rollers, ..	٤	٢	٢
٤	Hauling equipment-dumpers, trucks, tippers	٤	٢	٢
٥	Cost of owning and operating construction equipment	٤	٢	٢
٦	Conveying equipment-Belts, cables, conveyors	٤	٢	٢
٧	First Exam	٤	٢	٢
٨	Internal combustion engine and fundamentals of hydraulic circuits	٤	٢	٢
٩	Hoisting equipment-Crane (derrick cranes, mobile cranes, and tower cranes), forklift	٤	٢	٢
١٠	Aggregate production equipment-Jaw crusher, Gyratory crusher, Cone crusher	٤	٢	٢
١١	Equipment's concrete works-Agitation trucks, RMC plant or batching plants.	٤	٢	٢
١٢	Second Exam	٤	٢	٢
١٣	Pile-driving equipment-Single & double acting hammer, drop hammer, diesel hammer	٤	٢	٢
١٤	Construction equipment maintenance & Equipment life and replacement procedures	٤	٢	٢
١٥	A Case Study from any national project	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠

٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	R. Peurifoy, Construction planning, equipment and methods, ninth edition 2018.
	Other References	١ .Leonhard E. Bernold, Construction equipment and methods: planning, innovation, safety, ٢٠١٣ . ٢ .Roy Chudley & Roger Greeno, Construction Technology, ISBN-١٣ ٩٧٨٠١٣١٢٨٦٤٢٩.
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	https://benhaeng.ekb.eg/ Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form to students.
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Ahmed Saied Faheim El-Saaey

Name and Signature
Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Construction and Site Safety**			
Course Code (according to the bylaw)	**CMC ٣٠٤**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	--	1	**2**
Course Type	Compulsory			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mohab Roshdy Ahmed**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies. This course includes Students acquire working knowledge of construction hazards, safety precautions, and effective integration of safety regulations into the design and construction phases. Different types of construction-related hazards, including crane, equipment, and machinery, universal, access, construction, operation, and maintenance hazards, together with methods to prevent them from happening, are discussed.

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO١**	Apply knowledge to choose the better type of construction hazards.
A٦	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO٢**	Use safety precautions, and effective integration of safety regulations.
B٣	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	**CLO٣**	Manage safety regulations into the design and construction phases.
		CLO٤	Assess different types of construction-related hazards.
		CLO٥	Discuss cranes, equipment, and machinery, universal, access, construction, operation, and maintenance hazards together
D١	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and human sciences	**CLO٦**	Prevent construction-related hazards from happening without satisfying both aesthetic and technical requirements

٣. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Reports
٤. Case Study

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Tut.)
١	Acquiring students: acquiring working knowledge of construction hazards.	٣	٢	١
٢	Acquiring students: acquiring working knowledge of construction hazards.	3	٢	1
٣	Safety precautions and effective integration of safety regulations into the design and construction phases.	3	٢	1
٤	Safety precautions and effective integration of safety regulations into the design and construction phases.	3	٢	1
٥	Different types of construction-related hazards.	3	٢	1
٦	Different types of construction-related hazards.	3	٢	1
٧	Different types of construction-related hazards.	3	٢	1
٨	Crane, equipment, and machinery, universal, access.	3	٢	1
٩	Crane, equipment, and machinery, universal, access.	3	٢	1
١٠	Construction, operation, and maintenance hazards.	3	٢	1
١١	Construction, operation, and maintenance hazards.	3	٢	1
١٢	Construction, operation, and maintenance hazards.	3	٢	1
١٣	Methods to prevent construction hazards from happening.	3	٢	1
١٤	Methods to prevent construction hazards from happening.	3	٢	1
١٥	Methods to prevent construction hazards from happening.	3	٢	1

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٤. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (written)	١٢	٢٠	٢٠
	Student activities (reports, presentation)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٥. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Handbook of OSHA Construction Safety and Health Second Edition ISBN١٠: ٠٨٤٩٣٦٥٤٦٥ ٢٠٢٠.
	Other References	Construction Safety Engineering Principles (McGrawHill Construction Series): Designing and Managing Safer Job Sites, ISBN١٣: ٩٧٨٠٠٧١٤٨٣٤٤٨.
	Electronic Sources (Links must be added)	/https://www.oshacademy.com
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mohab Roshdy



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Design and Construction of Foundations & Earth Retaining Structures**			
Course Code (according to the bylaw)	**CMC ٣٠٥**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mohab Roshdy Ahmed**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes: Pile Foundations (Types of Piles - Load Transfer Mechanisms - Static Capacity for Piles - Field Load Tests – Pile Group – Elastic Centre Method - Design of Pile Caps) - Introduction to Earth Retaining Structures - Pile wall (Secant piles - Tangent Piles - Bored Pile Wall) - Construction Techniques and Design of Retaining Walls (Cantilever RW – Counterfort RW) – Introduction to Reinforced Soil RW - SPW.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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.	**CLO١**	Use limit analysis concepts to the calculation of limit load in Earth Retaining Structures
		CLO٢	Apply the knowledge of soil mechanics to design foundations
B٢	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.	**CLO٣**	Formulate the processes that govern ground response, to interpret field information and to predict soil response
D٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems.	**CLO٤**	Analyze cases of failure in Earth Retaining Structures

٤. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Project-Based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Tutorial
١	Pile Foundations (Types of Piles)	٤	٢	٢
٢	Bearing Capacity of Piles	٤	٢	٢
٣	Settlement of pile group- pile load test	٤	٢	٢
٤	Laterally Loaded Piles (Inclined Piles)	٤	٢	٢
٥	Design of Pile Caps	٤	٢	٢
٦	Design of Pile Caps	٤	٢	٢
٧	Introduction to Earth Retaining Structures	٤	٢	٢
٨	Stability of retaining walls	٤	٢	٢
٩	Design of retaining walls (Cantilever)	٤	٢	٢
١٠	Design of retaining walls (Counterfort)	٤	٢	٢
١١	Construction methods of sheet pile walls	٤	٢	٢
١٢	Design of sheet pile walls	٤	٢	٢
١٣	Design of sheet pile walls	٤	٢	٢
١٤	Construction Techniques for Pile Wall	٤	٢	٢
١٥	Introduction to Reinforced Soil RW	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam	١٢	٢٠	٢٠
٣	Student activities (assignment, discussion)	Throughout semester	١٠	١٠
٤	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	•El-Kasaby, E. A., Design and Construction of Deep and Special Foundations, Dar Al-Kutub Al-Almia, Cairo, ٤th Ed., (١٠٦٥١/٢٠١٦), ISBN ٩٧٨ – ٩٧٧ – ٧٢٦ – ١٦٨ – ٥, ٢٠١٦. •Hemed a, Advances in Soil Mechanics and Foundation Engineering, Intech Open, London ISBN: ٩٧٨-١-٧٨٩٨٤-٢٩٠-٦,٢٠٢٠
	Other References	Bowles, J., Foundation Analysis and Design, McGraw - Hill, ٥th. Ed., ISBN ٩٧٨ – ٠٠٧ - ٩١٢ – ٢٤٧ – ٧, ٢٠٠٩.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://apps.dtic.mil/sti/citations/ADA123637
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mohab Roshdy



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Project Planning, Scheduling, and Control**			
Course Code (according to the bylaw)	**CMC ٣٠٦**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	١	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Third Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Omia Said ElHadidi**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide Concept of project planning, definition of planning techniques [Bar chart, arrow network, program evaluation and review technique (PERT), critical path method (CPM), line of balance technique (LOB)], Work Breakdown Structure (WBS), logic, networking by using CPM technique, scheduling and control models. Resource allocation and leveling, optimal schedules, documentation and reporting, time and cost control, progress monitoring and evaluation. Computer applications by Primavera software package.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs(NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٢	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.	**CLO١**	Evaluate the basics of Project Planning, the role of project participants, and the construction work breakdown to plan the project
A٦	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO٢**	Explain the networks of Project Planning and its techniques and how to deal with the project
B٣	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.	**CLO٣**	Present the time scheduling of the project and its Resources.
		CLO٤	Use suitable software to schedule the Project
B٤	Deal with bidding, contracts and financial issues including project insurance and guarantees	**CLO٥**	Illustrate the critical notice of bidding and contracts that deal with scheduling, resources, and Project Economy.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials

3. Computer-based Instruction
4. Project-based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to Concepts of Project Planning	٥	٢	٣
٢	Introduction to Concepts of Project Planning	٥	٢	٣
٣	Techniques of planning	٥	٢	٣
٤	Techniques of planning	٥	٢	٣
٥	Project Scheduling	٥	٢	٣
٦	Project Scheduling	٥	٢	٣
٧	١st midterm	٥	٢	٣
٨	Resource management	٥	٢	٣
٩	Resource management	٥	٢	٣
١٠	Computer applications using the Primavera software package on Time management	٥	٢	٣
١١	Computer applications by Primavera software package on Time management	٥	٢	٣
١٢	٢nd midterm	٥	٢	٣
١٣	Applications for construction projects	٥	٢	٣
١٤	Applications in construction projects	٥	٢	٣
١٥	Final Revision	٥	٢	٣

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST**Mid-term exam (written)**	٧th	٣٠	٣٠
٢	٢ND**Mid-term exam practical**	١٢th	٢٠	٢٠

	Student activities (assignment, project)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Textbook: Authors: Jimmie-Hinze " Construction Planning and Scheduling" Publisher: Prentice Hall; (International Ed.) ٤th edition (January ٢٠١٣), ISBN-١٣: ٩٧٨-٩٣٣٢٥٠٥٧٣٥
	Other References	Reference: Daniel W. Halpin, Bolivar A. Senior, Gunnar Lucko "Construction Management" John Wiley & Sons, Inc., ٥th Edition (August ٢٠١٧), ISBN: ٩٧٨-١-١١٩-٢٥٦٨٠-٩
	Electronic Sources (Links must be added)	https://www.ekb.eg **https://www.icoste.org/index.htm#icec**
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form to students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
CourseCoordinator

Dr Omia ElHadidi

Name and Signature
Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Cost Engineering & Quantity Surveying**			
Course Code (according to the bylaw)	**CMC ٣٠٧**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Omia Said ElHadidi**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in two fields, Cost Engineering & Quantity Surveying which includes: Introduction to project cost estimate, Conceptual estimating, cost indices, Quantity take-off methods, estimating costs for construction material, labour, equipment, project overhead, mark-up and profit, unit costs, production rates, and pricing methods, balanced bid and budget form preparation for projects., and bid unbalancing.

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٦	Plan, supervise, and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO١	Identify the basics of the principles of cost estimate and indices
B٣	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.	CLO٢	Explain the basics of Quantity Take-off
		CLO٣	Illustrate types and steps of cost estimate
B٤	Deal with biddings, contracts, and financial issues, including project insurance and guarantees	CLO٤	Evaluate the project's direct cost and indirect cost
		CLO٥	Perform the bidding, contracts, and financial issues for the project

٣. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Problem-based Learning
4. Case Study

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction	٤	٢	٢
2	Principals to Cost Estimate	٤	٢	٢
3	Construction quantity take-off Methods	٤	٢	٢
4	**Con.** Construction quantity take-off Methods	٤	٢	٢
5	**Con.** Construction quantity take-off Methods	٤	٢	٢
6	Types of Cost Estimate Methods	٤	٢	٢
7	Con. Types of Cost Estimate Methods	٤	٢	٢
8	Project Resources Cost	٤	٢	٢
9	Direct &indirect costs	٤	٢	٢
10	Con. Direct &indirect costs	٤	٢	٢
11	Balanced Bid	٤	٢	٢
12	Con. Balanced Bid	٤	٢	٢
13	Unbalanced Bid	٤	٢	٢
14	Con. Unbalanced Bid	٤	٢	٢
15	Final Revision	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٤. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST **Mid-term exam (written)**	٧	٣٠	٣٠
٢	٢ND **Mid-term exam**	١٢	٢٠	٢٠
	Student activities (assignment, project)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٥. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Martin Brook "Estimating and Tendering for Construction Work", Taylor & Francis Ltd, ٥th edition, (٣٦ Jul ٢٠١٦), ISBN١٣: ٩٧٨١١٣٨٨٣٨٠٦٢
	Other References	David Bratt, Fundamentals of Construction Estimating, Cengage Learning; ٤th edition (Jan., ٢٠١٨): ISBN-١٣: ٩٧٨-١٣٣٧٣٩٩٣٩٥
	Electronic Sources (Links must be added)	https://www.icoste.org/index.htm#icec
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Omia ElHadidi

Name and Signature
Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Senior Design Project I**			
Course Code (according to the bylaw)	**CMC ٣٠٨**			
Department/s participating in delivery of the course	**Construction Engineering and Management**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٠	٤	٠	٢
Course Type	**Compulsory**			
Academic level at which the course is taught	**Third Level**			
Academic Program	**Construction Engineering and Management Program**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Assoc. Prof. Wafaa Arandah**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Pr.Req.: According to the selected project.

Topics are selected by groups of students according to their area of interest upon advisor approval. Projects address solutions to open-ended applications using an integrated engineering approach. Actual construction projects are selected by groups of students upon advisor approval for analysis. The management and technology aspects of construction are simulated and investigated.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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.	**CLO١**	Discuss the laws and codes of practice, and standards
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO٢**	Use planning and drawing software programs.
A٦	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO٣**	Design the project, taking into consideration the management principles.
A٧	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**CLO٤**	Work efficiently as a member of the team.
A٨	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO٥**	Illustrate how to communicate effectively with a range of audiences using contemporary tools in a project.
A٩	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO٦**	Use creative, innovative and flexible thinking in project management

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A١٠	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLOV	Study novel systems to solve technical issues and practice self-learning.
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO٨	Analyze structural elements and properties of materials according to project management.
B٢	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.	CLO٩	Explain all reinforced concrete structural elements and properties of materials according to building construction method.
B٣	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.	CLO١٠	Illustrate the building structure, elements and materials according to construction method.
B٤	Deal with bidding, contracts and financial issues including project insurance and guarantees.	CLO١١	Select suitable tenders, contracts, and financial issues.
D ١	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	CLO١٢	**Create** architectural, urban, and planning designs that satisfy both aesthetic and technical requirements
D٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems	CLO١٣	Drive the project presentation including WBS and activity list.

٤. Teaching and Learning Methods

1. Computer-based Instruction
2. Discussion
3. Project
4. Problem-based Learning
5. Co-operative Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction of the project steps	٤	٠	٤
2	Project scope	٤	٠	٤
3	Project scope	٤	٠	٤
4	Studying project document	٤	٠	٤
5	Contracts and Tendering	٤	٠	٤
6	Contracts and Tendering	٤	٠	٤
7	Creating WBS and activity list	٤	٠	٤
8	Creating WBS and activity list	٤	٠	٤
9	Learning primavera	٤	٠	٤
10	Learning primavera	٤	٠	٤
11	Learning primavera	٤	٠	٤
12	Construction method	٤	٠	٤
13	Construction method	٤	٠	٤
14	Construction method	٤	٠	٤
15	Construction method	٤	٠	٤

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	**Discussion**	Every week	٢٥	٢٥٪
٢	Presentations	Every week	٢٢	٢٢٪

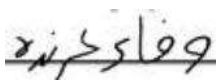
٣	Assignment	٣,٦	٣	٣٪
٤	Project	١٦	٥	٣٠٪
٥	Final Oral Exam	١٦	٥	٣٠٪
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Project Management Institute (PMI). (٢٠٢١). A Guide to the Project Management Body of Knowledge (PMBOK® Guide) (7th ed.). Project Management Institute. Sears, S. K., Sears, G. A., Clough, R. H., Rounds, J. L., & Segner, R. O. (٢٠١٥). Construction Project Management: A Practical Guide to Field Construction Management (٦th ed.). John Wiley & Sons.
	Other References	Hendrickson, C. (٢٠٠٨). Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects and Builders. Prentice Hall. Oberlender, G. D. (٢٠١٤). Project Management for Engineering and Construction (٣rd ed.). McGraw-Hill Education.
	Electronic Sources (Links must be added)	https://www.ekb. https://www.pmi.org https://www.ekb.eg https://www.cmaa.org
	Learning Platforms (Links must be added)	MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes, Project Guidelines, Lecture Slides, and Case Study Templates are available with all materials used in lectures in electronic form for students.
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show Computers / Laptops
	Supplies	White Board Board Markers & Erasers
	Electronic Programs	Primavera P٦ / MS Project MS Excel Building Information Modeling (BIM) Software / AutoCAD
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator

Assoc. Prof. Wafaa Arandah



Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Quality Control, Inspection and Repair of Structures**			
Course Code (according to the bylaw)	**CMC ٣٠٩**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	١	٢
Course Type	Compulsory			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mona Ibrahim Ali**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in two fields; first is Quality Control and Inspection, which includes: Introduction to quality improvement techniques. Control charts for variables and attributes. Quality systems; ISO ٩٠٠٠, ISO ١٤٠٠٠. Total quality management. Maintenance of structures. Inspection and its related subjects. **Second is the repair of structures:** Introduction to deterioration of structures, causes, and investigation. Structural behavior and different repair techniques for different structural materials.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٦	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO١	Determine quality improvement techniques for engineering projects, taking into consideration other trades requirements.
		CLO٢	Apply control charts for variables and attributes quality systems; ISO ٩٠٠٠, ISO ١٤٠٠٠.
A٩	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations	CLO٣	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to quality management systems implementation.
		CLO٤	Assign creative, innovative and flexible manner for the maintenance of structures.
B٣	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.	CLO٥	Manage the inspection and maintain safety measures in construction and materials; and assess environmental impacts of projects.
		CLO٦	Examine the deterioration of structures and its causes.
D١	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and human sciences	CLO٧	Produce an investigation of structural behavior that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory.
		CLO٨	Design a repair technique with different structural materials that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory.

٤. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Discussion
٤. Interactive learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to quality improvement techniques	٣	٢	١
٢	Introduction to quality improvement techniques	٣	٢	١
٣	Control charts for variables and attributes. Quality systems; ISO ٩٠٠٠, ISO ١٤٠٠٠.	٣	٢	١
٤	Control charts for variables and attributes. Quality systems; ISO ٩٠٠٠, ISO ١٤٠٠٠.	٣	٢	١
٥	Total quality management	٣	٢	١
٦	Total quality management	٣	٢	١
٧	First Exam	٣	٢	١
٨	Maintenance of structures	٣	٢	١
٩	Maintenance of structures	٣	٢	١
١٠	Deterioration of structures, causes and investigation	٣	٢	١
١١	Deterioration of structures, causes and investigation	٣	٢	١
١٢	Second Exam	٣	٢	١
١٣	Structural behavior	٣	٢	١
١٤	Different repair techniques for different structural materials	٣	٢	١
١٥	Different repair techniques for different structural materials	٣	٢	١

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	- Repair of building (٢٠١٦) By Prof Elsayed Elkasby ISBN: ٩٧٨٩٧٧٧٣٦١٤٠١.
	Other References	Concrete and Steel Construction: Quality Control and Assurance by Mohamed A. El-Reedy, CRC press, ٢٠١٣
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thingi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Dr Mona Ibrahim Ali



Program Coordinator
Dr Ahmed Gamal



Humanities Compulsory Courses

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Professional Ethics**			
Course Code (according to the bylaw)	**UHS ١٠٤**			
Program/s participating in delivery of the course	**Construction Engineering and Management Program**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	٢	٠	٠	٢
Course Type	**Compulsory**			
Academic level at which the course is taught	**Third Level**			
Academic Program	**Bachelor of Engineering of Construction Engineering and Management Program**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Assoc. Prof. Ibrahim Maged**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** ٧/١٠/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** ١٨/١١/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

The course covers the definition of law and its duties. Highlights on the civil and criminal laws for the engineer; highlights on the laws of syndicates and enterprises. Highlights the laws of taxes and environmental protection. Scope and objectives of the ethics of the engineering profession. Nature of the engineering professions (experimentation, safety, risk and carelessness), Professional behavior, Responsibilities towards customers and supervisors, Rules, Rights of Engineers, Codes of Ethics, Engineers as Managers, Consultants and Leaders.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
PLO٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles.	CLO١	Demonstrate and analyze ethical issues in the subject matter under investigation or in a relevant field
		CLO٢	Identify the multiple ethical interests at stake in a real-world situation or practice
PLO5	Practice research techniques and methods of investigation as an inherent part of learning.	CLO٣	Create awareness to provide safety, risk reduction, and risk-benefit analysis
		CLO٤	Demonstrate knowledge of ethical values and codes to integrate, synthesize, and apply knowledge of ethical dilemmas and solutions

٤. Teaching and Learning Methods

١- Lecture
٢- Hybrid Learning
٣- Interactive Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to Engineering Ethics	2	٢	0
٢	Ethical Issues Faced by Engineers	2	٢	0
٣	Engineering Codes of Ethics	2	٢	0
	Professionalism and Codes of Ethics	2	٢	0
٤	Ethical Theories	2	٢	0
	Plagiarism & Cheating	2	٢	0
٥	Risk, Safety, and Accidents	2	٢	0
	Design for Safety	2	٢	0
٦	Professional Rights	2	٢	0
	Ethics in Research and Experimentation	2	٢	0
٧	First Exam	2	٢	0
٨	Egyptian code, the ethics of practicing the engineering profession	2	٢	0
٩	First: General responsibilities of the engineer towards the community	2	٢	0
١٠	The second: The engineer's relationship with the engineering community towards fellow engineers	2	٢	0
١١	Third: Intellectual property	2	٢	0
١٢	Second Exam	2	٢	0
١٣	Fourth: Responsibility of the engineer towards customers	2	٢	0
١٤	Fifth: Professional Practice: Business Preparation	2	٢	0
١٥	Sixth: Continuing education and training	2	٢	0

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' asessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam	١٢	٢٠	٢٠

	Student activities (assignment, observations)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Egyptian code, the ethics of practicing the engineering profession
	Other References	• Engineering ethics: Concepts and cases, ٦th ed. by Charles E. Harris; Michael S. Pritchard; Michael J. Rabins; Ray James; Elaine Englehardt, ٢٠١٩ • Engineering ethics: Real world case studies by Steve Starrett; Amy L. Lara; Carlos, ٢٠١٧
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form to students
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	Projector/Data Show
	Supplies	White Board
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator

Assoc. Prof. Ibrahim Maged

Program Coordinator

Dr. Ahmed Gamal

Elective Courses

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification –Spring- ٢٠٢٥-٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Value Engineering in the Construction Industry**			
Course Code (according to the bylaw)	**CMC ٣١٠**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Ahmed Adel Abo-Shark**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in two fields. First is transportation planning, which includes: The value concept: history, definitions, application to the construction industry, incentive provisions in construction contracts, factors to be considered, application to design. Value engineering methodology: information phase, speculative phase, analytical phase, proposal phase, and final report phase. Value engineering study procedures: objective, selecting the input required, required documentation, life cycle cost methodology.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
B٣	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.	CLO١	**Explain** the value concept: history, definitions, and application to the construction industry.
		CLO٢	**Study** Value engineering methodology: information phase, speculative phase, analytical phase, proposal phase, and final report phase.
B٤	Deal with bidding, contracts, and financial issues, including project insurance and guarantees.	CLO٣	**Apply** Value engineering study procedures: objective, selecting the input required, required documentation, and life cycle cost methodology.
A٦	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO٤	**Estimate** the functional cost and choose the best alternative.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Value history and concepts.	4	2	2
2	Value history and concepts.	4	2	2
3	Application to the construction industry	4	2	2
4	Application to the construction industry	4	2	2
5	Incentive provisions in construction contracts	4	2	2
6	Incentive provisions in construction contracts	4	2	2
7	First exam	4	2	2
8	Value engineering methodology	4	2	2
9	Analytical phase, proposal phase, and final report phase	4	2	2
10	Value engineering study procedures: objective	4	2	2
11	Selecting the input required, required documentation	4	2	2
12	Second exam	4	2	2
13	Selecting the input required, required documentation	4	2	2
14	Life cycle cost methodology	4	2	2
15	Final exam	4	2	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam (practical + Oral)**	١٢	٢٠	٢٠
	Student activities (assignment, report)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	-Value Engineering: Concepts, Techniques and Applications First Edition by Anil Kumar Mukhopadhyaya, ٢٠١٢. -Value Analysis and Engineering Reengineered: The Blueprint for Achieving Operational Excellence and Developing Problem Solvers and Innovators ١st Edition by Abate O. Kassa, **٢٠١٥.**
	Other References	-
	Electronic Sources (Links must be added)	https://projectcostsolutions.com/how-value-engineering-is-used-in-construction-projects/
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Ahmed Adel Abo-Shark



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Building Technology**			
Course Code (according to the bylaw)	**CMA ٣١١**			
Department/s participating in delivery of the course	**Construction Engineering and Management Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Ayman M. Zakaria**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Building technology of the main elements of building structural systems. Different structural systems will be addressed through describing and explaining their varied functions, types, materials, design considerations and execution techniques. (Reinforced Concrete structures, Precast reinforced concrete construction, Steel structures)

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO١**	Discuss the symbols and codes of different building materials.
A٥	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO٢**	Search basic structural systems and their components.
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٣**	Carry out fieldwork in a team group to design suitable working and execution drawings for structural and foundation
		CLO٤	Compare construction systems & their materials.
B٣	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.	**CLO٥**	Prepare technical and professional drawings using engineering tools.
		CLO٦	Coordinate construction elements as one integrated whole system.
D٢	Generate ecologically responsible, environmental conservation and rehabilitation designs; through an understanding of structural design, construction, technology, and engineering problems	**CLO٧**	Discuss construction problems and items in an appropriate professional manner.
		CLO٨	Transfer techniques and solutions from one field of architecture to another.

Σ. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Presentations
4. Case Study
5. Projects- based Learning
6. Discussion

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to building construction:	4	2	2
2	Building construction & structural systems:	4	2	2
3	Skeleton structure system	4	2	2
4	Large span structure.	4	2	2
5	Foundation types	4	2	2
6	Isolated and combined footings components	4	2	2
7	First Exam	4	2	2
8	Continuation of the previous lecture and evaluation.	4	2	2
9	Site visit	4	2	2
10	Raft & Pile foundation systems components.	4	2	2
11	Presentation of research	4	2	2
12	Second Exam	4	2	2
13	Masonry Work: Brick and block types	4	2	2
14	Lintel and parapet in wall construction.	4	2	2
15	Building insulation types	4	2	2

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
٣	Student activities (Mini-Project, report, Assignments)	Throughout semester	١٠	١٠
٤	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

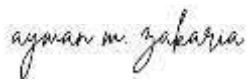
٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• BARRY, R.,The Construction of Buildings, (Vol. I, IV) Ed., Granada Technical Books, London, ١٩٨٠. • CHING, F., Building Construction Illustration, John Wiley, New York, ١٩٩١. • CHUDLEY, R., Construction Technology, 2nd Ed., Essex, England: Longman, ١٩٨٧. • GREENO, Roger, Principles of Construction. - ٢nd Ed., Essex: Longman, ١٩٨٦. • LYONS, Arthur, Materials for architects and Builders, Oxford: Elsevier, ٢٠٢٠. • MCKAY, W.B., Building Construction, (Vol. ١), last Ed., Longman, London. • MC ROVEN, Ch., Building with Stone, Lippincott & Crowell Publishers, New York١٩٨٠. • NASHED, Fred, Time – Saver Details for Exterior wall Design, N.Y.: McGraw-Hill, ١٩٩٦. • NIKOLAS, Davies & JOKINIEMI, Erkki, Dictionary of Architecture and Building Construction, ٢nd Edition. ٢٠٢٠. • OSBOURN, D., Introduction to Building, England: Wesley,١٩٩٧.

		• ROSEN, Harold J, Architectural Materials for Construction, N.Y.: Mcgraw – Hill, ١٩٩٦. • ROY, Chudley & GREENO, Roger.BA, Advanced construction Technology,٣rd Edition, ٢٠٠٥
	Other References	SEELY, I.H. - Building Technology- Mac Millan - London - ١٩٩٥.
	Periodicals, Web Sites, … etc	http:// www.archnet.org http://www.greatbuilding.com http:// www.architecture.com
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Ayman M. Zakria



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Engineering Economy**			
Course Code (according to the bylaw)	**CMC ٣١٢**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes which includes: Foundations of Engineering Economy, Interest Factors, Nominal and Effective Interest Rates, Present Worth Analysis, Annual Worth Analysis, Rate of Return Analysis, Benefit/Cost Analysis, Breakeven and Payback Analysis, Replacement and Retention Decisions, Effects of Inflation, Estimating Costs, Depreciation Methods, After-Tax Economic Analysis, Multiple Attributes and Risk.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٦	Plan, supervise, and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO١	**Discuss** the Foundations of Engineering Economy, Interest Factors, Nominal and Effective Interest Rates.
B٣	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.	CLO٢	**Calculate** the Rate of Return, Present Worth, Annual Worth, Rate of Return, Benefit/Cost.
		CLO٣	**Apply** Breakeven and Payback Analysis, Replacement and Retention Decisions. project
B٤	Deals with bidding, contracts and financial issues including project insurance and guarantees.	CLO٤	**Discuss** Effects of Inflation.
		CLO٥	**Estimate** Costs, Depreciation Methods, After-Tax Economic Analysis, Multiple Attributes and Risk.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Problem-Based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Foundations of Engineering Economy, Interest Factors	4	2	2
2	Foundations of Engineering Economy, Interest Factors	4	2	2
3	Nominal and Effective Interest Rates, Present Worth Analysis.	4	2	2
4	Nominal and Effective Interest Rates, Present Worth Analysis.	4	2	2
5	Annual Worth Analysis, Rate of Return Analysis.	4	2	2
6	Benefit/Cost Analysis, Breakeven and Payback Analysis	4	2	2
7	First Exam	4	2	2
8	Replacement and Retention Decisions, Effects of Inflation.	4	2	2
9	Replacement and Retention Decisions, Effects of Inflation.	4	2	2
10	Estimating Costs, Depreciation Methods	4	2	2
11	Estimating Costs, Depreciation Methods	4	2	2
12	Second Exam	4	2	2
13	After-Tax Economic Analysis, Multiple Attributes and Risk.	4	2	2
14	After-Tax Economic Analysis, Multiple Attributes and Risk.	4	2	2
15	After-Tax Economic Analysis, Multiple Attributes and Risk.	4	2	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠

	Student activities (assignment, Mini-Project)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Engineering Economy, William G. Sullivan, Elin M. Wicks, & C. Patrick Koelling, Seventeenth Global Edition, Pearson, 2020, ISBN 13: 978-1-292-26490-5. • Engineering Economy, Leland Blank & Anthony Tarquin, McGraw-Hill, Eighth Edition, 2018, ISBN:978-0-07-352343-9
	Other References	Basics of Engineering Economy, Leland Blank & Anthony Tarquin, McGraw-Hill, Third Edition, 2020, ISBN-13: 978-1260571141
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Marwa Hany Bondok

Name and Signature
Program Coordinator

Dr. Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Highway Facilities**			
Course Code (according to the bylaw)	**CMC ٣١٣**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Ahmed Gamal Mahmoud Morsi**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes Analysis of factors in developing highway transportation facilities, problems of highway geometric problems and design standards, planning and location principles, intersection design factors, structural design of pavement, and highway maintenance.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO١**	Assess environmental issues of highway projects
A٥	Practice research techniques and methods of investigation as an inherent part of learning	**CLO٢**	Apply research techniques in highway soil stabilization
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٣**	Design highway intersections and Horizontal alignment
B٣	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.	**CLO٤**	Manage highway Maintenance
D٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems	**CLO٥**	Design flexible pavement according to Egyptian code.

٤. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Presentations
٤. Case Study
٥. Projects- based Learning
٦. Discussion

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to geometric design	٤	٢	٢
٢	Cross section elements	٤	٢	٢
٣	Sight distance	٤	٢	٢
٤	Vertical Alignment	٤	٢	٢
٥	Horizontal Alignment	٤	٢	٢
٦	Horizontal Alignment cont.	٤	٢	٢
٧	Intersection design	٤	٢	٢
٨	Introduction to structure design	٤	٢	٢
٩	Soil Classification	٤	٢	٢
١٠	Soil Strength	٤	٢	٢
١١	Highways soil stabilization	٤	٢	٢
١٢	Traffic characteristics	٤	٢	٢
١٣	Highways pavement design	٤	٢	٢
١٤	Highway maintenance	٤	٢	٢
١٥	Pavement Management	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam**	١٢	٢٠	٢٠

	Student activities (assignment, report, project)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Nicholas Garber, Lester Hoel, Traffic and Highway Engineering, Fifth Enhanced SI Edition, CENGAG Learning, ٢٠٢٠. Traffic and Highway Engineering, Nicholas Garber and Lester Hoel, Fifth Enhanced SI Edition, CENGAG Learning, ٢٠٢٠, ISBN-١٣: ٩٧٨-١-٣٣٧-٦٣١٠٤-٤.
	Other References	Egyptian Codes for Highways.
	Electronic Sources (Links must be added)	https://www.ekb.eg https://highways.dot.gov
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator
Dr Ahmed Gamal



Name and Signature
Program Coordinator
Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Construction Quality Management**			
Course Code (according to the bylaw)	**CMC ٣١٤**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, and attitudes, which include: Overview of quality, quality in construction projects, quality management system. Quality improvement techniques, control charts for variables and attributes. Lot-by-lot acceptance sampling by attributes, acceptance sampling systems, cost of quality, assessment of quality, total quality management. Computers and quality control.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٦	Plan, supervise, and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO١**	Identify the basics of the principles of quality in construction projects
B٣	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.	**CLO٢**	Explain quality management systems and Quality improvement techniques.
		CLO٣	Illustrate efficiently how to do lot-by-lot acceptance sampling by attributes, acceptance sampling systems of quality
B٤	Deals with bidding, contracts and financial issues, including project insurance and guarantees.	**CLO٤**	Calculate the project's cost of quality & total quality management
		CLO٥	Recognize the importance of Computers in quality control.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Problem-Based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Basics of the Principle of Quality in construction projects	4	2	2
2	Basics of the Principle of Quality in construction projects	4	2	2
3	Quality management system	4	2	2
4	Quality management system	4	2	2
5	Quality management system	4	2	2
6	Quality improvement and control techniques	4	2	2
7	**First Exam**	4	2	2
8	Lot-by-lot acceptance sampling by attributes, acceptance sampling systems of quality	4	2	2
9	Project's cost of quality	4	2	2
10	Project's cost of quality	4	2	2
11	Total quality management	4	2	2
12	**Second Exam**	4	2	2
13	Construction projects quality control using Computers	4	2	2
14	Successful applications	4	2	2
15	Final Revision	4	2	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

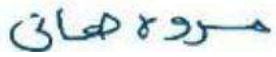
No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, Mini-Project)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Abdul Razzak Rumane, "Quality Management in Construction Projects" book, Published by CRC Press of Taylor & Francis Group, 2nd edition, December 10, 2019, ISBN 9780367890032
	Other References	
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Marwa Hany Bondok



Name and Signature
Program Coordinator

Dr. Ahmed Gamal



Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Bridge Building Technology**			
Course Code (according to the bylaw)	**CMC ٣١٥**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies. This course includes A study of the unique design considerations, construction challenges, and load paths for a range of bridge types. Topics include fixed and moveable bridges, stringer/girder, steel truss, concrete slab, box girder, arch, suspension, and cable-stay bridges. Emphasis is placed on AASHTO loading and design requirements, load testing, and verification of unconventional materials. Covers case studies of bridges around the world.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO١**	Utilize codes of practice and standards of steel structures to check the allowable stresses.
A٥	Practice research techniques and methods of investigation as an inherent part of learning	**CLO٢**	Use research techniques and Standard structures for safety requirements (serviceability deflection)
B١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٣**	Apply of different loads and structural analysis of bridges
B٣	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.	**CLO٤**	Select specified considerations for planning a range of bridge types.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
D٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems	**CLO٥**	Calculate the critical straining actions for bridge elements.
		CLO٦	Design of bridge elements.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Presentations
4. Case Study
5. Projects- based Learning
6. Discussion

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	A study of the unique design considerations.	٤	٢	٢
2	A study of the unique design considerations.	٤	٢	٢
3	Design of stringer	٤	٢	٢
4	Design of Plate girder	٤	٢	٢
5	Concrete slab, Steel bridge with truss system	٤	٢	٢
6	Concrete slab, Steel bridge with truss system	٤	٢	٢
7	**First Exam**	٤	٢	٢
8	Design of box girder	٤	٢	٢
9	Design of arch bridge	٤	٢	٢
10	Suspension and cable-stayed bridges	٤	٢	٢
11	Suspension and cable-stayed bridges	٤	٢	٢
12	**Second Exam**	٤	٢	٢
13	Emphasis is placed on AASHTO loading and design requirements, load testing, and verification of unconventional materials.	٤	٢	٢
14	Emphasis is placed on AASHTO loading and design requirements, load testing, and verification of unconventional materials.	٤	٢	٢
15	Covers case studies of bridges around the world	٤	٢	٢

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam	١٢	٢٠	٢٠
	Student activities (assignment, report, project)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	- Steel-concrete Composite Bridges by Nicholas J. Garber, Lester A. Hoel, ICE Publishing, 2013
	Other References	- AISC Steel Design manual from CMCE 2315
	Electronic Sources (Links must be added)	https://www.ekb.eg https://www.conexpoconagg.com/news/emerging-techtrends- in-bridge construction https://www.britannica.com/technology/bridge-engineering
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Marwa Hany Bondok



Name and Signature
Program Coordinator

Dr. Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Dynamics of Structures**			
Course Code (according to the bylaw)	**CMC ٣١٦**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Amr Ramadan**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in the Dynamics of Structures, which includes Types of dynamic loads and the formulation of the equation of motion. Single-degree-of-freedom systems, free and forced vibrations of multi-degree-of-freedom systems. Response of structures to earthquakes. Design response spectra for structures, Design criteria for seismic-resistant structures, Seismic response of tall buildings.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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	CLO١	**Illustrate** the main components of dynamic structure
		CLO٢	**From** the Equation of motion for single- and multi-degree-of-freedom systems
		CLO٣	**Examine** single and multi-degree of freedom systems
B٢	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**.**		**Analyze** the different RC structure elements.
		CLO٤	**Present** an overview of Seismological background, lateral load-resisting systems, and an introduction to earthquake analysis methods.
B٤	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems.	CLO٥	**Discuss** dynamic analysis and environmental loads
		CLO٦	**Investigate** free and forced vibration

٤. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Problem-based Learning
٤. Case Study

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to dynamic analysis	٤	٢	٢
٢	Types of dynamic loads	٤	٢	٢
٣	Formulation of the Equation of motion	٤	٢	٢
٤	Single degree of freedom systems (Free vibration)	٤	٢	٢
٥	Single degree of freedom systems (Forced vibration)	٤	٢	٢
٦	Single degree of freedom systems (Forced vibration)	٤	٢	٢
٧	First Exam	٤	٢	٢
٨	Two- and multi-degree-of-freedom systems	٤	٢	٢
٩	Two and multi-degree-of-freedom systems	٤	٢	٢
١٠	Model analysis (Eigenvalue problem)	٤	٢	٢
١١	Model analysis (Eigenvalue problem)	٤	٢	٢
١٢	Second Exam	٤	٢	٢
١٣	Introduction to Earthquake analysis using equivalent static method and response spectrum method	٤	٢	٢
١٤	Design criteria for seismic-resistant structures.	٤	٢	٢
١٥	Seismic response of tall buildings.	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (written)	١٢	٢٠	٢٠
	Student activities (assignment, Discussion)	Throughout semester	٧	٧
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Discussion	Throughout semester	٣	٣
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	• William T. Thomson (auth.)-Theory of Vibration with Applications-Springer US (1st edition 1993)
	Other References	• Dynamics of Structures: Theory and Applications to Earthquake Engineering by Anil K. Chopra (١st edition ١٩٩٥)
	Electronic Sources (Links must be added)	https://engineering.purdue.edu/UCIST/TeachingModules/UG%20Exercises/Introduction%20to%20Dynamics%20of%20Structures/student.pdf
	Learning Platforms (Links must be added)	Welcome! - Thingi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Amr Ramadan Elgamal



Name and Signature
Program Coordinator

Dr. Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Design of Metallic Structures-٢**			
Course Code (according to the bylaw)	**CMC ٣١٨**			
Department/s participating in the delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Nader Nabih Khalil**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies. This course includes: Composite construction - Composite floor beams (Strength requirement - shear connectors - formed metal deck) - Design of composite columns - Flexure design of slender sections - Connection classification and design (Flexible - Rigid - Semi-rigid) - Design of base plates and anchor bolts - Introduction of Load and Resistance Factor Design (LRFD) - Identification of Limit states (Strength limit state and Serviceability limit state) - Design of tension, compression and flexure members using LRFD approach.

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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.	**CLO١**	Discuss the specified considerations for understanding composite sections and the ultimate load design method, LRFD.
		CLO٢	Apply specified considerations to understand the properties of slender sections and their connections.
B٢	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.	**CLO٣**	Calculate the critical straining action for elements.
		CLO٤	Design of Steel Structure elements.
D٢	Generate ecologically responsible, environmental conservation, and rehabilitation designs through an understanding of structural design, construction technology, and engineering problems.	**CLO٥**	Use codes of practice and standards of steel structures to check the allowable stresses.
		CLO٦	Utilize codes of practice and standards of steel structures to check safety requirements (serviceability & deflection)

٣. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Problem-based Learning
4. Case Study

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Design of hinged bases	٤	٢	٢
2	Design of fixed bases	٤	٢	٢
3	Introduction to slender sections	٤	٢	٢
4	Flexure design of slender sections	٤	٢	٢
5	Normal forces design of slender sections	٤	٢	٢
6	Connection classification and design (Flexible - Rigid - Semi-rigid)	٤	٢	٢
7	**First Exam**			
8	Composite construction	٤	٢	٢
9	Design of composite floor beams (Strength requirement - shear connectors)	٤	٢	٢
10	Design of composite columns	٤	٢	٢
11	Introduction to (LRFD), Identification of Limit states (Strength limit state and Serviceability limit state)	٤	٢	٢
12	**Second Exam**			
13	Design of tension members (LRFD).	٤	٢	٢
14	Design of compression members (LRFD).	٤	٢	٢
15	Design of flexure members (LRFD).	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٤. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of Total Course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	٧	٣٠	٣٠
٢	**٢ND Mid-term exam**	١٢	٢٠	٢٠
٣	**Student activities (assignment)**	**Throughout semester**	٣	٣
٤	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**	٥, ٩, ١١	٧	٧
TOTAL			١٠٠	١٠٠

٥. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	١) Steel structures design by P.Dr. Abdel Rahim Khalil Dessouki. ISBN: ٩٧٧-٥٤٣٣-٦٥-١. 2) Steel design by. P. Dr. Bahaa M. Mashaly Part ١. Vth Edition, ISBN: ٩٧٧-٣٣٣-٥٤٩-٨.
	Other References	Egyptian codes for design of steel structure (ASD and LRFD).
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	**Staff lectures notes**
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	NA
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Nader Nabih Khalil



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Prefabricated Water and Prestressed Concrete Structures**			
Course Code (according to the bylaw)	**CMC ٣٢٠**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Third level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in the design of R.C. structures, which includes Prefabricated concrete: design methods, floor and roof systems, wall panels, and construction joints. Concrete water structures: design considerations, water tightness. Construction of circular and rectangular tanks. Prestressed concrete: basic principles, methods, and systems of prestressing; partial loss of prestressing; analysis and design for flexure, shear, and bearing.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.	CLO١	**Apply** knowledge to choose the better type of structural system
		CLO٢	**Use** different structural systems for planning RC buildings.
B٣	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**.**	CLO٣	**Analyze** the different RC structure elements.
		CLO٤	**Design** the different reinforced concrete structural elements according to ECP.
D٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems.	CLO٥	**Apply** the Principals of designing to the water-structural elements**.**
		CLO٦	**Make** the reinforcement details and draw the full structure details.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials

3. Problem-based Learning
4. Case Study

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Prefabricated concrete: design methods, floor, and roof systems.	4	2	2
2	Continue Prefabricated concrete: design methods, floor, and roof systems.	4	2	2
3	wall panels and construction joints.	4	2	2
4	Continue wall panels and construction joints.	4	2	2
5	Concrete water structures: design considerations, water tightness.	4	2	2
6	Continue Concrete water structures: design considerations, water tightness.	4	2	2
7	First Exam	4	2	2
8	Construction of circular and rectangular tanks.	4	2	2
9	Continue Construction of circular and rectangular tanks.	4	2	2
10	Prestressed concrete: basic principles, methods, and systems of prestressing.	4	2	2
11	Continue: Prestressed concrete: basic principles, methods, and systems of prestressing.	4	2	2
12	Second Exam	4	2	2
13	Partial loss of prestressing.	4	2	2
14	Analysis and design for flexural, shear and bearing.	4	2	2
15	Continue Analysis and design for flexural, shear, and bearing.	4	2	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				

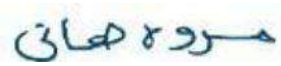
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, Discussion)	Throughout semester	٨	٨
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٢	٢
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Shaker Elbehary handbook. • Design of RC Structure halls – DR.M. Hilal • Reinforced Concrete: Mechanics and Design by James • K. Wight, James G. MacGregor, Prentice Hall, 5 Edition 2008
	Other References	• Egyptian Code for Design & Construction of Reinforced Concrete Structures – ECOP 203-2018.
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Marwa Hany Bondok



Name and Signature
Program Coordinator

Dr. Ahmed Gamal



Humanities Elective Courses

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Communication and Presentation Skills**			
Course Code (according to the bylaw)	**UHS ٣٠١**			
Department/s participating in delivery of the course	**Construction Engineering and Building Management Program**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	**0**	**0**	**2**
Course Type	**Electives**			
Academic level at which the course is taught	**Third Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Mohamed Adel**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

A general introduction to communication, the importance of communication, types of communication, communication obstacles, communication skills, features and methods of effective presentation, verbal communication: speaking skills – non-verbal communication – dialogue skills and persuasion strategies – communication in the work environment – writing resume – writing formal reports and letters.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	COL١	Apply communication skills with a range of audiences using contemporary tools.
		COL٢	Use self-confidence and strong determination graphically, verbally and in writing in the project
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	COL٣	Use creative templates and techniques to construct and deliver presentations suitable for expressing ideas.
		CLO٤	Discuss the dialogue skills and persuasion strategies in the work environment

٤. Teaching and Learning Methods

1. Lecture
2. Presentations
3. Interactive Learning
4. Hybrid Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	What is Communication?	٢	٢	٠
2	Effective Communication Processes	٢	٢	٠
3	Skilled Sender & Skilled Receiver	٢	٢	٠
4	Skilled Sender & Skilled Receiver	٢	٢	٠
5	Types of Communication (Channels)	٢	٢	٠
6	Types of Communication (Channels)	٢	٢	٠
7	First Mid-Term Exam	٢	٢	٠
8	Presentation structure	٢	٢	٠
9	Presentation structure	٢	٢	٠
10	Developing a Persuasive Delivery Style	٢	٢	٠
11	Developing a Persuasive Delivery Style	٢	٢	٠
12	Second Mid-Term Exam	٢	٢	٠
13	Rehearsing process	٢	٢	٠
14	Active listening	٢	٢	٠
15	Negotiation skills	٢	٢	٠

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

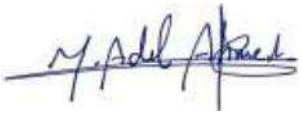
No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	V	٣٠	٣٠
٢	**٢ND Mid-term exam (practical + Oral)**	١٢	٢٠	٢٠
	Student activities (assignment, report)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Mike Markel; Stuart A. Selber, "Practical Strategies for Technical Communication", Macmillan Learning, ٣rd edition, ٢٠١٩
	Other References	Mike Markel; Stuart Selber, "Technical Communication", Macmillan Learning, ١٣th edition,٢٠٢١
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Mohamed Adel



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Leadership Skills**			
Course Code (according to the bylaw)	**UHS ٣٠٢**			
Department/s participating in delivery of the course	**Construction Engineering and Building Management Program**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	**0**	**0**	**2**
Course Type	**Electives**			
Academic level at which the course is taught	**Third Level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

The course aims to develop the students' leadership and management skills – Develop their opportunities for excellence, by introducing the leadership and administrative personality traits – The most important ways of transformation from mobility to leadership – The most important strategies of excellence and leadership interaction – developing some skills and ethics of leadership and management related to planning self and other management – Effective decision-making methods and techniques – motivational methods – the skill of change leadership – management and leadership ethics.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	COL١	Use a variety of visual and multimedia tools, tailoring communication to diverse audiences within leadership and management contexts
		COL٢	Discuss the reports and proposals summarizing complex leadership and management data and clear visuals for effective communication.
A9	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	COL٣	Identify emerging trends and challenges in leadership and management.
		CLO٤	Illustrate the complex leadership and management issues, encouraging divergent perspectives

٤. Teaching and Learning Methods

1. Lecture
2. Presentations
3. Interactive Learning
4. Hybrid Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Leadership Theories & Styles	٢	٢	٠
2	Leadership Theories & Styles	٢	٢	٠
3	Team Dynamics & Communication	٢	٢	٠
4	Decision-Making & Problem-Solving	٢	٢	٠
5	Motivation & Delegation	٢	٢	٠
6	Motivation & Delegation	٢	٢	٠
7	First Exam	٢	٢	٠
8	Project Management & Execution	٢	٢	٠
9	Project Management & Execution	٢	٢	٠
10	Entrepreneurial Principles & Innovation	٢	٢	٠
11	Entrepreneurial Principles & Innovation	٢	٢	٠
12	Second Exam	٢	٢	٠
13	Ethics & Sustainability	٢	٢	٠
14	Ethics & Sustainability	٢	٢	٠
15	Ethics & Sustainability	٢	٢	٠

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

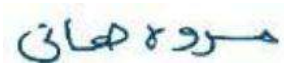
No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Primal Leadership, "Unleashing the power of Emotional Intelligence", Daniel Goleman, Harvard Business Review Press
	Other References	
	Electronic Sources (Links must be added)	https://www.ekb.eg https://info.email.online.hbs.edu/leadership-ebook
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Marwa Hany Bondok



Name and Signature
Program Coordinator

Dr. Ahmed Gamal



Fourth Level Courses Specifications

Compulsory Courses

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Project Finance & Management**			
Course Code (according to the bylaw)	**CMC ٤٠١**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	١	٢	٣
Course Type	Compulsory			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Omia Said ElHadidi**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies in two fields: Project Finance & Management, which includes: Preparation of budgets. Type of budget. Classification of costs. Project cost accounting, time cost envelope (S-Curve), income and expenses cash flow forecasting, and cost of capital lock-up. The factors that affect capital lock-up. Economic assessments. Profitability measures. Inflation. Accuracy of future estimates. Financial modeling. Cost-benefit analysis. The financing of plant. Systematic plant selection

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٢	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.	CLO١	Perform the basics of projects and the basics of project budgets
A٦	Plan, supervise, and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO٢	Describe and Present Project cost accounting, time cost envelope (S-Curve), income and expenses cash flow forecasting, and factors that affect capital lock-up
B٣	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.	CLO٣	Plan economic assessments and profitability measures.
		CLO٤	Analyze cost-benefit, inflation, and accuracy of future estimates
B٤	Deal with biddings, contracts, and financial issues, including project insurance and guarantees	CLO٥	Formulate the critical notice of bidding and contracts that deal with the preparation of budgets.

٤. Teaching and Learning Methods

1. Lecture
2. Computer-based Instruction
3. Project-based Learning
4. Tutorials

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction	5	2	3
2	Concepts of Preparation of budgets	5	2	3
3	Type of budget& Classification of costs	5	2	3
4	Project cost accounting	5	2	3
5	Cash flow	5	2	3
6	Con. Cash flow	5	2	3
7	١st midterm	5	2	3
8	Cost control	5	2	3
9	Time cost envelope (S-Curve	5	2	3
10	Income and expenses cash flow forecasting	5	2	3
11	Time cost trade-off	5	2	3
12	٢nd midterm	5	2	3
13	Cost of capital lock-up	5	2	3
14	Con. Time cost trade-off	5	2	3
15	Final Revision	5	2	3

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam practical	١٢	٢٠	٢٠

	Student activities (assignment, project)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Daniel W. Halpin "Construction Management" textbook, John Wiley & Sons; ٥th edition (August ٧, ٢٠١٧), ISBN-١٣: ٩٧٨-١١١٩٢٥٦٨٠٩.
	Other References	David Bratt, Fundamentals of Construction Estimating, Cengage Learning; ٤th edition (Jan., ٢٠١٨): ISBN-١٣: ٩٧٨-١٣٣٧٣٩٩٣٩٥
	Electronic Sources (Links must be added)	https://www.icoste.org/index.htm#icec
	Learning Platforms (Links must be added)	Welcome! - Thingi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
CourseCoordinator

Dr Omia ElHadidi



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Construction Project Specifications, Bids, and Contracts**			
Course Code (according to the bylaw)	**CMC ٤٠٣**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	-	١	٢
Course Type	Compulsory			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Omia Said El Hadidi**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, and attitudes, which include:
Participants in a construction contract. Contract definition. Types of contracts; formation principles of a contract, performance or breach of contractual obligations. Analysis and comparison of the different kinds of construction contracts. Bidding logistics. Legal organizational structures. Different types and uses of specifications. Different forms of contracts utilized in construction.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs(NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٦	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO١	Identify the basics of principles in a construction contract.
B٣	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.	CLO٢	Explain Types of contracts, formation principles of a contract, performance or breach of contractual obligations.
		CLO٣	Illustrate and compare the different kinds of construction contracts
B٤	Deal with biddings, contracts, and financial issues, including project insurance and guarantees	CLO٤	Organize the construction projects with bidding logistics and Legal organizational structures.
		CLO٥	Write Different types and uses of specifications. Different forms of contracts in construction.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Case Study
4. Project-based Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Tutorial)
1	Introduction & Principles of construction contract	٣	٢	١
2	Introduction & Principles of construction contract	٣	٢	١
3	Introduction & Principles of Tendering	٣	٢	١
4	Introduction & Principles of Tendering	٣	٢	١
5	Types of Tendering	٣	٢	١
6	Types of Tendering	٣	٢	١
7	١st midterm	٣	٢	١
8	Types of construction contract	٣	٢	١
9	Construction contract Egypt law	٣	٢	١
10	Construction contract Egypt law	٣	٢	١
11	Different types and uses of specifications	٣	٢	١
12	٢nd midterm	٣	٢	١
13	Different types and uses of specifications	٣	٢	١
14	Different forms of contracts utilized in construction.	٣	٢	١
15	Final Revision	٣	٢	١

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (written)	١٢	٢٠	٢٠
	Student activities (assignment, project)	Throughoutsemester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Daniel W. Halpin "Construction Management" textbook, John Wiley & Sons; ٥th edition (August ٧, ٢٠١٧), ISBN-١٣: ٩٧٨-١١١٩٢٥٦٨٠٩.
	Other References	Daniel W. Halpin, Bolivar A. Senior, Gunnar Lucko "Construction Management" John Wiley & Sons, Inc., ٥th Edition (August ٢٠١٧), ISBN: ٩٧٨-١-١١٩-٢٥٦٨٠-٩ Will Hughes, Ronan Champion, John Murdoch "Construction Contracts Law and Management" Published by Routledge (Taylor & Francis), April, ٢٠١٥ ISBN ٩٧٨٠٤١٥٦٥٧٠٤٤.
	Electronic Sources (Links must be added)	https://www.icoste.org/index.htm#icec https://www.procore.com/library/construction-biddingprocess
	Learning Platforms (Links must be added)	Welcome! - Thinqi **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
CourseCoordinator

Dr Omia ElHadidi

Name and Signature
Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Senior Design Project II**			
Course Code (according to the bylaw)	**CMC ٤٠٥**			
Department/s participating in delivery of the course	**Construction Engineering and Management**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	١	٤	٠	٣
Course Type	**Compulsory**			
Academic level at which the course is taught	**Fourth Level**			
Academic Program	**Construction Engineering and Management Program**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Assoc. Prof. Wafaa Arandah**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Pr.Req.: Senior Design Project I (CMC ٣٠٨)

Topics are selected by groups of students according to their area of interest upon advisor approval. Projects address solutions to open-ended applications using an integrated engineering approach. Actual construction projects are selected by groups of students upon advisor approval for analysis. The management and technology aspects of construction are simulated and investigated.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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.	**CLO١**	**Apply** engineering design processes to produce cost-effective solutions in planning and illustrating the project.
A٤	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**CLO٢**	**Use** the laws and codes of practice, and standards effectively in the final project
A٦	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**CLO٣**	**Supervise** the project, taking into consideration the management principles and other trades requirements
A٧	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**CLO٤**	**Work** efficiently with multi-disciplinary and multi-cultural teams.
A٨	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**CLO٥**	**Model** the time planning, cost, and survey software programs with a project team using contemporary tools.
A٩	Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO٦**	**Solve** technical management problems using creative, innovative and flexible thinking.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ١٠	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**CLOV**	**Study** new systems with acquired knowledge and other learning strategies to solve technical issues
B ١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٨**	**Design** the structural project according to cost and time
B ٢	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.	**CLO٩**	**Modify** the final project according to time and cost.
B ٣	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.	**CLO١٠**	**Prepare** the project management and quality control items.
B ٤	Deal with bidding, contracts and financial issues including project insurance and guarantees.	**CLO١١**	**Formulate** the safety and financial issues for the project
D ١	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**CLO١٢**	**Create** architectural, urban, and planning designs that satisfy both aesthetic and technical requirements
D ٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems	**CLO١٣**	**Drive** the final project presentation including all steps of the project.

٤. Teaching and Learning Methods

1. Lecture
2. Computer-based Instruction
3. Discussion
4. Project
5. Problem-based Learning
6. Co-operative Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to Project Time Planning	٥	١	٤
2	Project Survey	٥	١	٤
3	Survey Project with Rivet	٥	١	٤
4	Survey Project with Rivet			
5	Time Planning in Primavera	٥	١	٤
6	Time Planning in Primavera			
7	Contentious Time Planning in Primavera	٥	١	٤
8	Contentious Time Planning in Primavera			
9	Cost Analysis	٥	١	٤
10	Cost Analysis			
11	Learning primavera	٥	١	٤
12	Learning primavera			
13	Quality and Safety	٥	١	٤
14	Quality and Safety			
15	Value Engineering	٥	١	٤

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	**Discussion**	Every week	٢٥	٢٥٪
٢	Presentations	Every week	٢٢	٢٢٪
٣	Assignment	٣,٦	٣	٣٪

٤	Project	١٤	٥	٣٠٪
٥	Final Oral Exam	١٤	٥	٣٠٪
Total			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Project Management Institute (PMI). (٢٠٢١). A Guide to the Project Management Body of Knowledge (PMBOK® Guide) (Vth ed.). Project Management Institute. Sears, S. K., Sears, G. A., Clough, R. H., Rounds, J. L., & Segner, R. O. (٢٠١٥). Construction Project Management: A Practical Guide to Field Construction Management (٦th ed.). John Wiley & Sons.
	Other References	Hendrickson, C. (٢٠٠٨). Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects and Builders. Prentice Hall. Oberlender, G. D. (٢٠١٤). Project Management for Engineering and Construction (٣rd ed.). McGraw-Hill Education.
	Electronic Sources (Links must be added)	https://www.ekb. https://www.pmi.org https://www.ekb.eg https://www.cmaa.org
	Learning Platforms (Links must be added)	**MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes, Project Guidelines, Lecture Slides, and Case Study Templates are available with all materials used in lectures in electronic form for students.
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show Computers / Laptops
	Supplies	White Board Board Markers & Erasers
	Electronic Programs	Primavera P٦ / MS Project MS Excel Building Information Modeling (BIM) Software / AutoCAD
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Assoc. Prof. Wafaa Arandah

Program Coordinator
Dr Ahmed Gamal

Compulsory Field Training Courses

Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA	

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Field Training I**			
Course Code (according to the bylaw)	**FT ١٠٣**			
Department/s participating in delivery of the course	**Construction Engineering and Management**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	---	---	---	٠
Course Type	**Compulsory**			
Academic level at which the course is taught	**Completion of ٦٥ Credit Hours**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Mona Ibrahim**			
Course Specification Approval Date	**1/٩/٢٠٢٥**			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on 7/10/٢٠٢٥** **Approved in the Faculty Board Meeting Number (461) on 18/11/٢٠٢٥**			

٢. Course Overview (Brief summary of scientific content)

Pre. Req.: ** Completion of ٦٥ CR. HRS.

Time of training: not less than four weeks.

Field training is conducted under the supervision of a faculty member and field mentor in the actual field practice. The student must submit a detailed technical report by the end of training period, explaining what he learned during this training.

By the end of the training the student will be able to.

Apply the principles knowledge to execute practical engineering field works. The students will have the opportunity to work with multidisciplinary teams during the training period.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٧	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	CLO١	Identify work in individual and as a member of multi-disciplinary and multicultural teams within constraints...
		CLO٢	Identify the tasks, time, and resources.
A١٠	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO٣	Apply new knowledge in construction engineering concepts.
		CLO٤	Use modern techniques in construction application.

٤. Teaching and Learning Methods

١. Discussion Session
٢. Case Study
٣. Report.

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to building works, and Practice fieldwork, standard measurements and simulations according to the codes	٤٠	--	٤٠
٢	Plan implementation of engineering projects	٤٠	--	٤٠
٣	Stages of construction work from foundations to finishing. Sketch different types of layouts, plans, structures, and connections	٤٠	--	٤٠
٤	Learn how to receive various items, and Different finishing work Prepare technical reports	٤٠	--	٤٠

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	Report	At the first week of the next semester	١٥	٣٠%
٢	Presentation		١٥	٣٠%
٣	Oral test		٢٠	٤٠%

The field training is evaluated on pass / fail basis and does not count in the cumulative GPA calculation.

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Training facilities and sites
	Other References	**Egyptain codes of practice**
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Mona ibrahim



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Field Training II**			
Course Code (according to the bylaw)	**FT ٢٠٣**			
Department/s participating in delivery of the course	**Construction Engineering and Management**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	---	---	---	٠
Course Type	**Compulsory**			
Academic level at which the course is taught	**Completion of ٩٦ Credit Hours**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Mona Ibrahim**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Pre. Req.: ** Completion of ٩٦ CR. HRS.

Time of training: not less than four weeks

Field training conducted under the supervision of a faculty member and field mentor in actual field practice. The student must submit a detailed technical report by the end of training period, explaining what he learned during this training.

By the end of the training the student will be able to.

Apply the principles knowledge to execute practical engineering field works. The students will have the opportunity to work with multidisciplinary teams during the training period.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٧	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	CLO١	Identify work in individual and as a member of multi-disciplinary and multicultural teams within constraints.
		CLO٢	Identify the tasks, time, and resources.
A١٠	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO٣	Apply new knowledge in construction engineering concepts.
		CLO٤	Use modern techniques in construction application.

٤. Teaching and Learning Methods

١. Discussion Session
٢. Case Study
٣. Report

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to the technical office's work. Coordinate with the project manager for the responsibility of engineers inside the site.	٤٠	--	٤٠
٢	Study the different drawings, bill of quantities, specifications of the project and quality standards.	٤٠	--	٤٠
٣	Conduct fieldwork with consideration to safety regulations, risk assessment, and environmental aspects. And Quantity surveying and specifications work	٤٠	--	٤٠
٤	Using advanced software in design processes, and preparing the project schedule, writing a report, and coordinating with the project manager about the evaluation sheet	٤٠	--	٤٠

٥. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
١	Report	At the first week of the next semester	١٥	٣٠%
٢	Presentation		١٥	٣٠%
٣	Oral test		٢٠	٤٠%

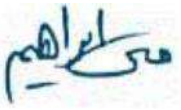
The field training is evaluated on pass / fail basis and does not count in the cumulative GPA calculation

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Training facilities and sites
	Other References	Egyptain codes of practice
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr. Mona ibrahim



Name and Signature
Program Coordinator

Dr Ahmed Gamal



Elective Courses

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Engineering for a Sustainable Environment**			
Course Code (according to the bylaw)	**CMC٤٠٧**			
Department/s participating in delivery of the course	**Construction Engineering and Management Program**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	-	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Boosy Samy**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

Solid, industrial and hazardous waste generation and control, with an emphasis on sustainable engineering practices such as environmental impact assessment and performance, waste management, pollution prevention, waste minimization, cleaner production, energy recovery, recycling and reuse.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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	**CLO١**	Use the national and international regulations related to Engineering for a Sustainable Environment
		CLO٢	Discuss the Environmental impact assessment and performance, waste management
A٤	Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following Transportation Civil printing topics: Traffic, Roadways and Airports, Railways, Sanitary Works, Resources and Harbors; Tie a yelevat emerging discipline.	**CLO٣**	Demonstrate nature and sources of solid, industrial
B٣	Plan and construction processes; construction defects, instability and construction materials; and assess environmental impacts of projects.	**CLO٤**	Create a suitable method for waste management, recycling and reuse.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussion
4. Presentation

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Solid, industrial and hazardous waste generation	٤	٢	٢
2	Solid, industrial and hazardous waste control	٤	٢	٢
3	Sustainable engineering practices	٤	٢	٢
4	Environmental impact assessment	٤	٢	٢
5	Environmental impact assessment	٤	٢	٢
6	environmental impact performance	٤	٢	٢
7	waste management	٤	٢	٢
8	waste management	٤	٢	٢
9	pollution prevention	٤	٢	٢
10	waste minimization	٤	٢	٢
11	waste minimization	٤	٢	٢
12	cleaner energy recovery, recycling and reuse	٤	٢	٢
13	cleaner energy recovery, recycling and reuse	٤	٢	٢
14	Traffic Control Devices and Intersection Control	٤	٢	٢
15	Cleaner production energy recovery, recycling and reuse	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (practical + Oral)	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	٥	٥
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				

٥	**Quizzes**		٥	٥
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Energy, the Environment, and Sustainability- Efstathios Michaelides - International Standard Book Number-13: 978-1-138-03844-8
	Other References	
	Electronic Sources (Links must be added)	https://www.ekb.eg https://openknowledge.worldbank.org/handle/10986/2159
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Boosy samy

Name and Signature
Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Environmental Engineering**			
Course Code (according to the bylaw)	**CMC ٤٠٩**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	-	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mahmoud Hamdy Badawy**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with the knowledge, skills, attitudes, and competencies in environmental engineering, which include an introduction to environmental engineering, pollution problems, types of pollution, degrees of Pollution, sources of pollution, surface water pollution, groundwater Pollution, rainwater Pollution, sea & ocean water pollution, air pollution. Soil pollution, pollution control, pollution prevention. Sample conditions, chemical pollution measurement in water, microbiological & biological pollution measurement in water, field pollution monitoring, environmental protection laboratory. Water supply, wastewater systems, solid waste management, air pollution. Solid waste management: collection, handling, separation and treatment, disposal, recycling, and reuse. Monitoring and control, noise, air pollution, environmental laws and their applications.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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.	**CLO١**	Use the national and international regulations related to the environment and pollution
		CLO٢	Discuss different Emissions which cause climate change and its Control - Environmental Impact Assessment, Ecological Sanitation.
A٤	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.	**CLO٣**	Demonstrate nature and sources of air pollution and ways for control and reduction.
B٣	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.	**CLO٤**	Describe nature and sources of water pollution, Soil pollution, noise pollution, solid waste management, and ways for control and reduction.

٤. Teaching and Learning Methods

١. Lecture
٢. Tutorials
٣. Discussion
٤. Presentation

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to Environmental Engineering, Environmental Control Philosophy, and National and International Environmental Regulations	٤	٢	٢
٢	Emissions Control and Environmental Impact Assessment	٤	٢	٢
٣	Emissions Control and Environmental Impact Assessment	٤	٢	٢
٤	Nature, Sources, and Control of Air Pollution	٤	٢	٢
٥	Air Pollution Control and Reduction	٤	٢	٢
٦	Water Pollution and Ecological Sanitation	٤	٢	٢
٧	Water Pollution and Ecological Sanitation	٤	٢	٢
٨	Noise Pollution	٤	٢	٢
٩	Soil Pollution	٤	٢	٢
١٠	Soil Pollution	٤	٢	٢
١١	Solid Waste Management	٤	٢	٢
١٢	Solid Waste Management	٤	٢	٢
١٣	Environmental Laws and Their Applications	٤	٢	٢
١٤	Environmental Monitoring and Pollution Control	٤	٢	٢
١٥	Integrated Environmental Management and Course Review	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

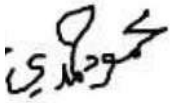
No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Peavy, Rowe and Tchobangolous " Environmental Engineering" McGraw Hill • Jeremy Colls, "Air Pollution", second edition, by Spon Press ٢٠٠٢.
	Other References	Prof. M. Bassuieny, "Pollution and Environment (2019) "
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Prof. M. Bassuieny, "Pollution and Environment (2019) "
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mahmoud Hamdy Badawy



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Special Topics in Structural Analysis**			
Course Code (according to the bylaw)	**CMC ٤١١**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	-	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr. Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, and attitudes, which include Elements of plate bending theory, circular plates, rectangular plates, and large deflections of plates. Membrane stresses in shells, bending stresses in shells. Applications to pipes, tanks and pressure vessels.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٣	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.	**CLO١**	Reiterate a comprehensive understanding of plate bending theory, including its fundamental elements and principles.
		CLO٢	Predict membrane stresses in shells, demonstrating proficiency in assessing structural integrity under various loading conditions.
A٤	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.	**CLO٣**	Analyze the concepts of circular plates, rectangular plates, and large deflections for complex engineering problems related to plate structures.
B٣	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.	**CLO٤**	Apply the acquired knowledge to real-world scenarios, specifically in the analysis of pipes, tanks, and pressure vessels, considering practical applications and industry standards.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials

3. Discussion
4. Presentation

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Elements of plate bending theory	٤	٢	٢
2	Elements of plate bending theory	٤	٢	٢
3	Circular and rectangular plates	٤	٢	٢
4	Circular and rectangular plates	٤	٢	٢
5	Large deflections of plates	٤	٢	٢
6	Large deflections of plates	٤	٢	٢
7	Membrane stresses in shells	٤	٢	٢
8	Membrane stresses in shells	٤	٢	٢
9	Membrane stresses in shells	٤	٢	٢
10	Bending stresses in shells	٤	٢	٢
11	bending stresses in shells	٤	٢	٢
12	bending stresses in shells	٤	٢	٢
13	Applications for pipes, tanks, and pressure vessels.	٤	٢	٢
14	Applications for pipes, tanks, and pressure vessels.	٤	٢	٢
15	Applications for pipes, tanks, and pressure vessels.	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam	١٢	٢٠	٢٠
	Student activities (assignment, report)	Throughout semester	١٠	١٠

٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	"Roark's Formulas for Stress and Strain" by Warren C. Young and Richard G. Budynas.
	Other References	
	Electronic Sources (Links must be added)	https://www.ekb.eg https://jackson.engr.tamu.edu/wpcontent/uploads/sites/229/2023/03/Roarks-formulas-for stressand- strain.pdf
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
	Other (to be mentioned)	Prof. M. Bassuieny, "Pollution and Environment (2019)"
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Dr. Marwa Hany Bondok

Program Coordinator
Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Advanced Engineering Materials**			
Course Code (according to the bylaw)	**CMC ٤١٣**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies. This course includes Polymers and Epoxies: types, properties, and applications of polymer concrete; fibers: different types of fiber-reinforced concrete, properties, production, and applications. Theory of failure of fiber-reinforced concrete, introduction to composite materials, Lightweight aggregate, natural and artificial aggregate, lightweight concrete, insulating concrete, structural lightweight concrete, properties of lightweight concrete, design mixes of lightweight concrete, failure theories of lightweight concrete under different stresses, Massing and heavy concrete. Introduction to Egyptian and International Specifications.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ١٠	Acquire and apply new knowledge, and practice self, lifelong, and other learning strategies.	**CLO ١**	Explain new knowledge of polymers and fibers that are used in engineering projects.
D ١	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**CLO ٢**	Apply new knowledge in advanced engineering materials using adequate knowledge and theory, local culture and heritage, and technologies.
D ٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems	**CLO ٣**	Design the mix of lightweight and heavy concrete.
		CLO ٤	Select material that is used in concrete to be suitable for environmental designs.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Presentation

4. Case Study
5. Self-Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Introduction to polymers	٤	٢	٢
2	Epoxies	٤	٢	٢
3	Fibers, different types of fibers reinforced concrete	٤	٢	٢
4	Fibers, different types of fibers reinforced concrete	٤	٢	٢
5	Properties of fiber-reinforced concrete in compression, tension, and bending	٤	٢	٢
6	Shear- Ferro-cement materials, behavior of Ferro-cement under different stresses	٤	٢	٢
7	Shear- Ferro-cement materials, behavior of Ferro-cement under different stresses	٤	٢	٢
8	Theories of composite materials	٤	٢	٢
9	Theories of composite materials	٤	٢	٢
10	Lightweight concrete	٤	٢	٢
11	Lightweight concrete	٤	٢	٢
12	Massing and heavy concrete	٤	٢	٢
13	Massing and heavy concrete	٤	٢	٢
14	Introduction of Egyptian and International Specifications	٤	٢	٢
15	Egyptian and International Specifications	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam practical	١٢	٢٠	٢٠
	Student activities (Presentation, project)	Throughout semester	١٠	١٠

٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Engineering Materials: Properties and Selection by Kenneth G. Budinski, Pearson, ٩th Edition, ٢٠١٧
	Other References	
	Electronic Sources (Links must be added)	https://onlinelibrary.wiley.com/journal/١٥٢٧٣٦٤٨
	Learning Platforms (Links must be added)	Welcome! - Thingi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	Laboratory
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Dr. Marwa Hany Bondok

Program Coordinator
Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Finishing Materials Technology**			
Course Code (according to the bylaw)	**CMA ٤١٥**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies. This course will focus on various building materials and construction techniques based on performance standards and codes, with each material's application explored in detail. To teach students about different types of floors and flooring materials, as well as partitions and panels, different surface finishes, and different routes of vertical transportation. To provide students with knowledge of the most recent advancements in building construction methods and their applications.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ١٠	Acquire and apply new knowledge, and practice self, lifelong, and other learning strategies.	**CLO ١**	Identify all necessary construction, technology, and architectural drawings that meet technical requirements.
		CLO ٢	Acquire construction techniques based on performing standards and codes
D ١	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**CLO 3**	Discuss the capability of: architectural design.
		CLO 4	Perform the knowledge of finishing material using and their properties.
D ٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems	**CLO 5**	Identify principles of environmental construction
		CLO 6	Illustrate an understanding of structural design, construction, and technology

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Discussion

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Construction materials, construction systems and their development	٤	٢	٢
2	Construction materials, construction systems and their development	٤	٢	٢
3	Modern advanced finishes for pattern	٤	٢	٢
4	Modern advanced finishes for pattern	٤	٢	٢
5	Modern advanced finishes for ceilings	٤	٢	٢
6	Modern advanced finishes for ceilings	٤	٢	٢
7	Modern advanced finishes for ceilings	٤	٢	٢
8	Modern advanced wall finishes	٤	٢	٢
9	pattern details	٤	٢	٢
10	wall details	٤	٢	٢
11	Ceiling details	٤	٢	٢
12	Ceiling details	٤	٢	٢
13	Shop drawing	٤	٢	٢
14	Shop drawing	٤	٢	٢
15	Shop drawing	٤	٢	٢

***This Schedule Includes Two Midterms Through the Vth and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	**١ST Mid-term exam (written)**	V	٣٠	٣٠
٢	**٢ND Mid-term exam practical**	١٢	٢٠	٢٠
	Student activities (Discussion)	**Throughout semester**	١٠	١٠
٥	**Final Exam (Written)**	١٦	٤٠	٤٠
Summative Assessment Method				
٥	**Quizzes**		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Dean, Y, (٢٠١٦), Materials Technology, ٢nd Edition, Routledge, ISBN: ٩٧٨١٣١٥٥٠٤٢٧٨ • Fernandez, J., (٢٠٠٥), Material Architecture: emergent materials for innovative buildings and ecological construction, ١st Edition, Architectural Press, ISBN-١٣: ٩٧٨-٠٧٥٠٦٦٤٩٧٤
	Other References	
	Electronic Sources (Links must be added)	https://www.ekb.eg
	Learning Platforms (Links must be added)	Welcome! - Thingi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	Laboratory
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Dr. Marwa Hany Bondok

Program Coordinator
Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Principles and Approaches of Smart Cities**			
Course Code (according to the bylaw)	**CMA ٤١٧**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٠	٢	٣
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies. This course includes The course will introduce the concept and technologies of smart cities (e.g., transportation, buildings), and the concept of smart cities. Students will not only master the core technologies for building and implementing solutions for a smart and sustainable city during the course, but they will also gain an understanding of the problems that these solutions face. Students are urged to use critical thinking skills to accept technological solutions that will help cities become smarter and more sustainable.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ١٠	Acquire and apply new knowledge, and practice self, lifelong, and other learning strategies.	**CLO ١**	Identify the environmental design principles
D ١	Create architectural, urban, and planning designs that satisfy both aesthetic and technical requirements, using adequate knowledge of history and theory, related fine arts, local culture and heritage, technologies, and human sciences.	**CLO ٢**	Discuss the basics of smart buildings
		CLO ٣	Define the factors affecting smart buildings developments
		CLO ٤	Outline the various strategies for smart buildings in advanced countries
D ٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems	**CLO ٥**	Analyze the factors affecting smart building requirements
		CLO ٦	Assess the impact of smart systems on behaviors and performance.

٤. Teaching and Learning Methods

1. Lecture
2. Tutorials
3. Presentation
4. Case Study
5. Self-Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
١	Introduction to course content	٤	٢	٢
٢	International & regional experience of sustainable & smart buildings	٤	٢	٢
٣	Importance of smart buildings in ٢١st Century	٤	٢	٢
٤	International cases of sustainable & smart buildings.	٤	٢	٢
٥	Green and smart cities	٤	٢	٢
٦	Elements & components of smart buildings	٤	٢	٢
٧	Elements & components of smart buildings	٤	٢	٢
٨	Low-tech smart system vs. High-tech smart systems	٤	٢	٢
٩	Low-tech smart system vs. High-tech smart systems	٤	٢	٢
١٠	Smart system: HTS Smart Envelop and Smart Glass	٤	٢	٢
١١	Smart System: Solar Water Heating (SWH)	٤	٢	٢
١٢	Smart System: Solar Water Heating (SWH)	٤	٢	٢
١٣	Understanding Energy consumption & Occupancy Patterns of a multi-purpose academic building	٤	٢	٢
١٤	Understanding Energy consumption & Occupancy Patterns of a multi-purpose academic building	٤	٢	٢
١٥	Selected cases studies: Smart & Sustainable buildings	٤	٢	٢

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam	١٢	٢٠	٢٠

	practical			
	Student activities (Presentation, Report)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	• Dean, Y, (٢٠١٦), Materials Technology, ٢nd Edition, Routledge, ISBN: ٩٧٨١٣١٥٥٠٤٢٧٨ • Fernandez, J., (٢٠٠٥), Material Architecture: emergent materials for innovative buildings and ecological construction, ١st Edition, Architectural Press, ISBN-١٣: ٩٧٨-٠٧٥٠٦٦٤٩٧٤
	Other References	• Sinopoli, J., Advanced Technology for Smart Buildings, Artech House, ٢٠١٧ • Governing Smart Cities:Policy Benchmarks for Ethical and Responsible Smart City-Development- JULY ٢٠٢١
	Electronic Sources (Links must be added)	https://education.nationalgeographic.org/resource/smartcities/
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	Laboratory
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Dr. Marwa Hany Bondok

Program Coordinator
Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Modeling and Simulation of Construction Systems**			
Course Code (according to the bylaw)	**CMC ٤١٩**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	٠	٣
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes Building Information Modeling, Computer modeling of construction processes, ٤-D Simulation of construction operations, Productivity modeling, measuring, and forecasting, Sequencing and coordination of construction systems, Post-Optimality Analysis of Integer and Linear Programming Models in construction, and discrete event simulation of construction processes

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ٧	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**CLO١**	Use different computer modeling of construction processes efficiently as a member in a working group in engineering projects.
A ٩	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO٢**	Use creative, innovative, flexible thinking and post-optimality analysis of integer and linear programming models in construction
A ١٠	Acquire and apply new knowledge, and practice self, lifelong, and other learning strategies.	**CLO٣**	Apply new knowledge of Building Information Modeling in the field of construction management
B ١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٤**	Explain basic concepts of using GIS in mapping the earth in spatial terms and populating the GIS system to access data
D ٢	Generate ecologically responsible environmental conservation and rehabilitation designs, through an understanding of structural design, construction, technology, and engineering problems	**CLO٥**	Use suitable software for Building Information Modeling

٤. Teaching and Learning Methods

1. Lecture
2. Computer-based Instruction
3. Interactive learning
4. Project-based Learning
5. Self-Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Concepts of BIM	4	2	2
2	Concepts of BIM	4	2	2
3	Techniques of BIM	4	2	2
4	Techniques of BIM	4	2	2
5	Computer applications in BIM and software package on management	4	2	2
6	Computer applications in BIM and software package on management	4	2	2
7	First Experimental Test	4	2	2
8	Sequencing and coordination of construction systems	4	2	2
9	Sequencing and coordination of construction systems	4	2	2
10	٤-D Simulation of construction operations& Productivity modeling	4	2	2
11	٤-D Simulation of construction operations& Productivity modeling	4	2	2
12	Second Experimental Test	4	2	2
13	Post-Optimality Analysis of Integer and Linear Programming Models	4	2	2
14	Post-Optimality Analysis of Integer and Linear Programming Models	4	2	2
15	Applications in BIM	4	2	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam practical	١٢	٢٠	٢٠
	Student activities (Report, project)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Modeling and Simulation of Systems Using MATLAB and Simulink- ٢٠١٧-ISBN ٩٧٨١٣١٥٢١٨٣٣٥
	Other References	
	Electronic Sources (Links must be added)	https://doi.org/١٠,١٢٠١/٩٧٨١٣١٥٢١٨٣٣٥ https://www.cambridgescholars.com/resources/pdfs/٩٧٨-١-٥٢٧٥-٥٠٠٥-٦-sample.pdf
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Dr. Marwa Hany Bondok

Program Coordinator
Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Geographic Information System GIS**			
Course Code (according to the bylaw)	**CMC ٤٢١**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	٠	٣
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Ahmed Elsayed Elhadary**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes Fundamentals of GIS -types, sources, and formats of data. GIS components, Data models, vector data models, Raster Data models, Data, and file structure. - Spatial Data Modeling- GIS Data Management- Data Input and Editing- Data Quality Issues- Data Analysis and Modeling- Creation of Information System: A Case Study.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ٧	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO١	Use GIS programs efficiently as a member of a working group in engineering projects.
A ٩	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO٢	Create and access data in the GIS system using an appropriate software package
A ١٠	Acquire and apply new knowledge, and practice self, lifelong, and other learning strategies.	CLO٣	Acquire GIS system information from databases, existing maps, and the Internet
B ١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	CLO٤	Explain basic concepts of using GIS in mapping the earth in spatial terms and populating the GIS system to access data
D ٢	Generate ecologically responsible environmental conservation and rehabilitation designs, through an understanding of structural design, construction, technology, and engineering problems	CLO٥	Classify the geographic information among several coordinate systems

٤. Teaching and Learning Methods

1. Lecture
2. Computer-based Instruction
3. Interactive learning
4. Project-based Learning
5. Self-Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Fundamentals of GIS -type, source, and format of data	4	2	2
2	GIS components	4	2	2
3	GIS components	4	2	2
4	Data models, vector data models, Raster Data models	4	2	2
5	Data and file structure	4	2	2
6	Spatial Data Modeling	4	2	2
7	First Experimental Exam	4	2	2
8	GIS Data Management	4	2	2
9	GIS Data Management	4	2	2
10	Data Input and Editing	4	2	2
11	Data Input and Editing	4	2	2
12	Second Experimental Exam	4	2	2
13	Data Analysis and Modeling	4	2	2
14	Creation of Information System: A Case Study	4	2	2
15	Creation of Information System: A Case Study	4	2	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam	١٢	٢٠	٢٠

	practical			
	Student activities (Report, project)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	An Introduction to Geographical Information Systems, by Ian Heywood, Sarah Cornelius, Steve Carver,Prentice Hall ٢٠٠٦, ISBN: ٠-١٣-١٢٩٣١٧-٦, ٩٧٨-٠-١٣- ١٢٩٣١٧-٥, ٩٧٨١٤٠٥٨٩٨٤٤٧ ELEMENTS OF GEOGRAPHIC INFORMATION SYSTEM-Brad Maguire- Andrew Miller-٢٠٠٨ Principle of Geographical Information Systems-Otto Husiman-٢٠٠٩- ISBN:٩٧٨- ٩٠-٦١٦٤-٥ Switching to ArcGIS Pro from ArcMap Second Edition- ISBN ١٠ ١٥٨٩٤٨٧٣١١-٢٠٢٢
	Other References	
	Electronic Sources (Links must be added)	https://education.nationalgeographic.org/resource/geographic-informationsystem-gis/
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator

Dr Ahmed Elsayed Elhadary

Program Coordinator

Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٦

١. Basic Information

Course Title (according to the bylaw)	**Modeling of structures**			
Course Code (according to the bylaw)	**CMC ٤٢٣**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	٢	٠	٣
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Marwa Hany Bondok**			
Course Specification Approval Date	1/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes General derivation of finite element equilibrium equations - General coordinate models for specific problem (one dimensional element - Plane stress/strain elements) - Lumping of structural properties and loads - Calculation of stresses and assessment of error - formulation of bar Element - Formulation of isoperimetric continuous elements: quadrilateral and triangular elements - Formulation of structural elements: beams - axisymmetric and plate bending elements - Numerical integration: Gauss formula (one dimension integration) - Integration in two dimensions- Computer Applications using ANSYS Engineering Simulation Software.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A ٧	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	**CLO١**	Use different computer modeling of construction processes efficiently as a member in a working group in engineering projects.
A ٩	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**CLO٢**	Formulate mathematical representations of complex problems in the context of finite element equilibrium equations with creative, innovative, flexible thinking
A ١٠	Acquire and apply new knowledge, and practice self, lifelong, and other learning strategies.	**CLO٣**	Use mathematical methods and basic science principles to analyze the behavior of structural elements
B ١	Select appropriate and sustainable technologies for the construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of: Structural Analysis and Mechanics, Properties and Strength of Materials, Surveying, Soil Mechanics, Hydrology and Fluid Mechanics.	**CLO٤**	Analyze the concepts of circular plates, rectangular plates, and large deflections for complex engineering problems related to plate structures.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
D ٢	Generate ecologically responsible environmental conservation and rehabilitation designs through an understanding of structural design, construction, technology, and engineering problems	CLO٥	Use ANSYS Engineering Simulation Software for practical computer-based applications in structural analysis.

٤. Teaching and Learning Methods

1. Lecture
2. Computer-based Instruction
3. Interactive learning
4. Project-based Learning
5. Self-Learning

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Expected number of Learning Hours	
			Theoretical Teaching	Training (Practical-Tutorial)
1	Finite Element Equilibrium Equations	4	2	2
2	General Coordinate Models	4	2	2
3	General Coordinate Models	4	2	2
4	Lump Structural Properties and Loads for analytical purposes.	4	2	2
5	Stresses and Assess Error of structures	4	2	2
6	Bar Elements Formulation	4	2	2
7	First Experimental exam	4	2	2
8	Develop Isoperimetric Continuous Elements	4	2	2
9	Develop Isoperimetric Continuous Elements	4	2	2
10	Structural Elements Formulation	4	2	2
11	Structural Elements Formulation	4	2	2
12	Second Experimental exam	4	2	2
13	Numerical Integration Techniques	4	2	2
14	Utilizing ANSYS for Computer Applications:	4	2	2
15	Utilizing ANSYS for Computer Applications:	4	2	2

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam practical	١٢	٢٠	٢٠
	Student activities (Report, project)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	G. Ramamurty, " Applied Finite Element Analysis", New Delhi: 2nd Edition, I.K. Inc, ٢٠١٠, ISBN-١٣: ٩٧٨-٩٣٨٠٥٧٨٤٥٣
	Other References	
	Electronic Sources (Links must be added)	http://ftp.demec.ufpr.br/disciplinas/TMV٣٨/Livros/Finite٪ ٢٠Element ٪ ٢٠Analysis,٪ ٢٠Theory٪ ٢٠and٪ ٢٠application٪ ٢٠with٪ ٢٠ANSYS, ٪ ٢٠.pdf
	Learning Platforms (Links must be added)	Welcome! - Thingi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	Laboratory
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Course Coordinator
Dr. Marwa Hany Bondok

Program Coordinator
Dr Ahmed Gamal

	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Research Methodologies**			
Course Code (according to the bylaw)	**UHS ٨٠١**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	--	--	٢
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of Engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mohab Roshdy Ahmed**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies. This course includes Scientific thinking and its specifications, definition of scientific research and its specifications, steps of scientific research and designing research tools and sample selection (choosing a research subject, defining the research problem and the principles of choice, setting the research frame and methodology, and data analysis). Types of scientific studies: Descriptive, survey and experimental studies. Scientific research methods: Descriptive method, social screening, content study, content analysis, types of experimental designs, descriptive methods, analytical methods.

٣. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٥	Practice research techniques and methods of investigation as an inherent part of learning.	**CLO١**	Explain the Clarification of expressions and ideas, Production of pieces of reasoning appropriate to the given task.
A١٠	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**CLO٢**	Identify the reasons and explanations, Ethical conceptstasks.
		CLO٣	Discuss the ethical dimension in the process of formulating and implementing engineering policies and strategies.
		CLO٤	Describe the major quantitative and qualitative research methods in mass communication research.

٤. Teaching and Learning Methods

١. Lecture
٢. Self-Learning
٣. Hybrid Learning
٤. Report
٥. Brainstorming

٦. Presentations

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Theoretical Teaching	Training
١	Scientific thinking and its specifications.	٢	٢	--
٢	Definition of scientific research and its specifications,	٢	٢	--
٣	Steps of scientific research	٢	٢	--
٤	Designing research tools and sample selection	٢	٢	--
٥	Types of scientific studies	٢	٢	--
٦	Descriptive, survey and experimental studies. Scientific research methods.	٢	٢	--
٧	Descriptive, survey and experimental studies. Scientific research methods.	٢	٢	--
٨	Descriptive method	٢	٢	--
٩		٢	٢	--
١٠		٢	٢	--
١١		٢	٢	--
١٢		٢	٢	--
١٣		٢	٢	--
١٤		٢	٢	--
١٥		٢	٢	--

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٥. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
Formative Assessment Method				
١	١ST Mid-term exam (written)	٧	٣٠	٣٠
٢	٢ND Mid-term exam (written)	١٢	٢٠	٢٠
	Student activities (report, presentation, observation)	Throughout semester	١٠	١٠
٥	Final Exam (Written)	١٦	٤٠	٤٠

Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

٦. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Critical Thinking Skills Developing Effective Analysis and Argument by Stella (z-lib.org),٢٠١٩.
	Other References	Cambridge International AS & A Level Thinking Skills Coursebook with Digital Access (٢ Years), ٤th Edition, John Chamberlain, Mark King, Andrew Roberts, ٢٠٢٤.
	Electronic Sources (Links must be added)	https://www.criticalthinking.org
	Learning Platforms (Links must be added)	Welcome! - Thinqi MICROSOFT TEAMS
	Other (to be mentioned)	Course Notes are available with all the slides used in lectures in electronic form with students
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

Name and Signature
Course Coordinator

Dr Mohab Roshdy



Name and Signature
Program Coordinator

Dr Ahmed Gamal



	Construction Engineering and Management Program	كلية الهندسة ببنها FACULTY OF ENGINEERING- BENHA

Course Specification - ٢٠٢٥

١. Basic Information

Course Title (according to the bylaw)	**Thinking Skills**			
Course Code (according to the bylaw)	**UHS ٨٠٣**			
Department/s participating in delivery of the course	**Civil Engineering Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Tutorial**	**Total**
	٢	--	--	٢
Course Type	Electives			
Academic level at which the course is taught	**Fourth level**			
Academic Program	**Bachelor of engineering (Construction Engineering and Management)**			
Faculty/Institute	**Benha Faculty of Engineering**			
University/Academy	**Benha University**			
Name of Course Coordinator	**Dr Mohab Roshdy Ahmed**			
Course Specification Approval Date	١/٩/٢٠٢٥			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Approved in the Department Board Meeting Number (78) on** 7/10/٢٠٢٥ **Approved in the Faculty Board Meeting Number (461) on** 18/11/٢٠٢٥			

٢. Course Overview (Brief summary of scientific content)

This course aims to provide students with knowledge, skills, attitudes, and competencies, this course includes: Theoretical concepts (memory – thinking – creativity), an introduction to teaching thinking skills, the nature of thinking (definition – characteristics – levels) types of thinking (creative – critical – scientific), cognitive thinking skills, metacognitive thinking skills, thinking measurement tools, different thinking patterns, and skills, strategies used to develop thinking skills, thinking skills programs, ways to teach thinking skills

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
A٥	Practice research techniques and methods of investigation as an inherent part of learning.	CLO١	Practice research techniques and methods in Critical Thinking.
A١٠	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO٢	Apply new strategies to solve unconventional engineering tasks.
		CLO٣	Analyze the causes and impact of an analytical failure.
		CLO٤	Classify the different techniques analysts can employ to interpret.

٣. Teaching and Learning Methods

١. Lecture
٢. Self-Learning
٣. Hybrid Learning
٤. Report
٥. Brainstorming
٦. Presentations

Course Schedule*

Number of Weeks	Scientific Content of the Course (Course Topics)	Total Weekly Hours	Theoretical Teaching	Training
١	Theoretical concepts (memory – thinking – creativity)	٢	٢	--
٢	Theoretical concepts (memory – thinking – creativity)	٢	٢	--
٣	Thinking (definition – characteristics)	٢	٢	--
٤	Types of thinking (creative – critical – scientific)	٢	٢	--
٥	Types of thinking (creative – critical – scientific)	٢	٢	--
٦	Thinking skills (cognitive & metacognitive)	٢	٢	--
٧	Thinking about measurement tools	٢	٢	--
٨	Thinking about measurement tools	٢	٢	--
٩	Thinking Patterns	٢	٢	--
١٠	Thinking Patterns	٢	٢	--
١١	Developing Thinking Skills in Engineering	٢	٢	--
١٢	Developing Thinking Skills in Engineering	٢	٢	--
١٣	Thinking skills programs	٢	٢	--
١٤	Thinking skills programs	٢	٢	--
١٥	Ways to teach thinking skills.	٢	٢	--

***This Schedule Includes Two Midterms Through the ٧th and ١٢th Weeks.**

٤. Methods of students' assessment

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٥	Final Exam (Written)	١٦	٤٠	٤٠
Summative Assessment Method				
٥	Quizzes		٠	٠
TOTAL			١٠٠	١٠٠

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	Electronic Sources (Links must be added)	https://www.criticalthinking.org
	Learning Platforms (Links must be added)	**Welcome! - Thinqi** **MICROSOFT TEAMS**
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	Supplies	Stopwatch - Measuring tape
	Electronic Programs	NA
	Skill Labs/ Simulators	NA
	Virtual Labs	NA
	Other (to be mentioned)	White Board

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