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

Program Specification
Bylaw 2023 according to NARS2018

1. Basic Information

Program Title (according to what is stated in the bylaw):	**Bachelor of Engineering (Construction Engineering and Management)**
Total number of credit hours/points of the program:	**160**
Number of academic years/levels (expected program duration):	**5 years**
Department (s) Participating (if any) in teaching the program:	• **Civil Engineering** • **Architecture Engineering** • **Mechanical Engineering** • **Basic Engineering Sciences**
Faculty/Institute:	**Benha Faculty of Engineering**
University/Academy:	**Benha University**
Program majors/divisions/tracks/specialties in the final year (if any):	**NA**
Partnerships with other parties and the nature of each (if any):	**NA**
Name of the program coordinator (attach the assignment decision):	**Dr Ahmed Gamal Mahmoud Morsi**
Program Specification Approval Date:	**Approved in the Department Board Meeting Number (78) on 7/10/2025**
Council responsible for Program Specification Approval (Attach the Decision / Minutes):	**Approved in the Faculty Board Meeting Number (461) on 18/11/2025**

2. Program Aims (Brief description of the overall purpose of the program)

This program aims to develop the skills and knowledge of students to complete construction projects on time and on budget while adhering to construction standards and safety guidelines within human values, social responsibility, and environmental conservation. Graduates will have sufficient experience to develop their postgraduate research skills and find local or international employment in the commercial, design-build, and residential sectors of the construction industry.

3. Program Structure (Curriculum)

- **Program Components**

Requirement Category/Type		Number of Courses	Number of Credit Hours/Points	Percentage from the total number of hours/points
University Requirements		7	14 CR	8.75 %
Faculty/College Requirements (if applicable)		12 *	32 CR	20 %
Program Requirements		42	114 CR	71.25 %
Requirements of the majors/ divisions/ tracks/ specializations in the final year (if any)		NA	NA	NA
Other requirements	Field Training	2	0 CR	0 %
	Graduation Project	2	5 CR	3.125 %
	Mandatory training year	NA	NA	NA
	Other (to be mentioned)	-	-	-
Total Compulsory Courses		54	136 CR	85 %
Elective Courses		3 University Requirements + 6 Program Requirements = 9	6 University Requirements + 18 Program Requirements =24	15 %
Total		61	160	100%

*Included 2 Field Training Course With zero CR

4. Program courses according to the expected study plan

Academic Level	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of Credit Hours/ Points	Number of Weekly Hours		
							Theoretical teaching	Practical training	Tutorial
Zero	خريف	FRB001	Analytical geometry & Linear Algebra	اجباري	كلية	3	2	0	2
Zero	خريف	FRB003	Statics	اجباري	كلية	3	2	0	2
Zero	خريف	FRB005	Waves and Heat	اجباري	كلية	3	2	2	1
Zero	خريف	FRB007	Chemistry for Engineers	اجباري	كلية	4	3	2	1
Zero	خريف	FRM009	Engineering Drawing	اجباري	كلية	2	0	0	4
Zero	خريف	UHS101	Foreign Language	اجباري	جامعة	2	2	0	0
Zero	خريف	UHS103	Social issues	اجباري	جامعة	2	2	0	0
Zero	ربيع	FRB002	Integration & Multivariable functions	اجباري	كلية	3	2	0	2
Zero	ربيع	FRB004	Dynamics	اجباري	كلية	3	2	0	2
Zero	ربيع	FRB006	Electricity and Magnetism	اجباري	كلية	3	2	2	1
Zero	ربيع	FRM008	Production Systems Engineering	اجباري	كلية	2	1	3	0
Zero	ربيع	FRM010	Engineering Drawing by Computer	اجباري	كلية	2	1	2	0
Zero	ربيع	UHS 102	Information and Communicatio n Technology	اجباري	جامعة	2	2	0	0
Zero	ربيع	FRE 012	Computer Programming Fundamentals	اجباري	كلية	2	0	2	2
One	خريف	FRB 101	Engineering Differential Equations	اجباري	تخصص	3	2	0	2
One	خريف	CMC 101	Structural Analysis-1	اجباري	تخصص	3	2	0	2
One	خريف	CMC 103	Properties and Testing of Construction Materials	اجباري	تخصص	2	2	1	0
One	خريف	FRB 103	Environmental Pollution and Industrial Safety	اجباري	كلية	2	2	1	0

Academic Level	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of Credit Hours/ Points	Number of Weekly Hours		
							Theoretical teaching	Practical training	Tutorial
One	خريف	CMC 105	Surveying for Engineers-1	اجباري	تخصص	3	2	2	1
One	خريف	CMA 107	Basic Architectural Engineering	اجباري	تخصص	2	1	0	2
One	خريف	CMC 109	Fluid Mechanics	اجباري	تخصص	2	2	1	0
One	ربيع	FRB 102	Water Chemistry	اجباري	تخصص	3	2	2	0
One	ربيع	CMC 102	Structural Analysis- 2	اجباري	تخصص	3	2	0	2
One	ربيع	CMC 104	Construction Materials and Concrete Technology	اجباري	تخصص	3	2	2	1
One	ربيع	CMC 106	Construction Engineers Drawing	اجباري	تخصص	2	1	3	0
One	ربيع	CMC 108	Surveying for engineers 2	اجباري	تخصص	3	2	0	2
One	ربيع	CMA 110	Building Construction	اجباري	تخصص	2	2	0	1
One	ربيع	CMC 112	Hydraulics for Construction	اجباري	تخصص	2	2	1	0
One	صيف	FT 103	Field Training I	اجباري	كلية	0	0	0	0
Two	خريف	FRB 201	Applied Engineering Probability and Mathematical Statistics	اجباري	تخصص	3	2	2	0
Two	خريف	CMC 201	Hydrology and Water Resources	اجباري	تخصص	3	2	0	2
Two	خريف	CMC 203	Soil Mechanics	اجباري	تخصص	3	2	2	1
Two	خريف	CMC 205	Design of Metallic Structures-1	اجباري	تخصص	3	2	0	2
Two	خريف	CMC 207	Design of R.C. Structures-1	اجباري	تخصص	3	2	0	2
Two	خريف	UHS XXX	Humanities Elective I	اختياري	جامعة	2	2	0	0
Two	ربيع	FRB 104	Engineering Numerical Analysis	اجباري	تخصص	3	2	2	0
Two	ربيع	CMC 202	Transportation and Traffic Engineering	اجباري	تخصص	3	2	1	2
Two	ربيع	CMC 204	Geotechnical Engineering & Foundations	اجباري	تخصص	3	2	2	1

Academic Level	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of Credit Hours/ Points	Number of Weekly Hours		
							Theoretical teaching	Practical training	Tutorial
Two	ربيع	CMC 206	Construction Project Management	اجباري	تخصص	3	2	0	2
Two	ربيع	CMC 208	Design of R.C. Structures-2	اجباري	تخصص	3	2	0	2
Two	ربيع	CMA 210	Introduction to City Planning	اجباري	تخصص	2	2	0	1
Two	صيف	FT 203	Field Training II	اجباري	كلية	0	0	0	0
Three	خريف	CMM 301	Technical Installations in Buildings	اجباري	تخصص	2	1	3	0
Three	خريف	CMC 303	Methods and Equipment for Construction	اجباري	تخصص	3	2	0	2
Three	خريف	CMC 305	Design and Construction of Foundations & Earth Retaining Structures	اجباري	تخصص	3	2	0	2
Three	خريف	CMC 307	Cost Engineering & Quantity Surveying	اجباري	تخصص	3	2	0	2
Three	خريف	CMC 3XX	Elective I	اختياري	تخصص	3	2	0	2
Three	خريف	CMC 309	Quality Control & Inspection of Structures	اجباري	تخصص	2	2	0	1
Three	خريف	UHS XXX	Humanities Elective II	اختياري	جامعة	2	2	0	0
Three	ربيع	CMC 302	Sanitary Engineering	اجباري	تخصص	3	2	2	1
Three	ربيع	CMC 304	Construction and Site Safety	اجباري	تخصص	2	2	0	1
Three	ربيع	CMC 3XX	Elective II	اختياري	تخصص	3	2	0	2
Three	ربيع	CMC 306	Project Planning, Scheduling, and Control	اجباري	تخصص	3	2	1	2
Three	ربيع	CMC 3XX	Elective III	اختياري	تخصص	3	2	0	2
Three	ربيع	UHS 104	Professional Ethics	اجباري	جامعة	2	2	0	0
Three	ربيع	CMC 308	Senior Design Project I	اجباري	تخصص	2	0	4	0
Four	خريف	CMC 401	Project Finance &Management	اجباري	تخصص	3	2	1	2

Academic Level	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of Credit Hours/ Points	Number of Weekly Hours		
							Theoretical teaching	Practical training	Tutorial
Four	خريف	CMC 4XX	Elective IV	اختياري	تخصص	3	2	0	2
Four	خريف	CMC 4XX	Elective V	اختياري	تخصص	3	2	0	2
Four	خريف	CMC 403	Construction Project Specifications, Bids, and Contracts	اجباري	تخصص	2	2	0	1
Four	خريف	CMC 4XX	Elective VI	اختياري	تخصص	3	2	2	0
Four	خريف	CMC 405	Senior Design Project II	اجباري	تخصص	3	1	4	0
Four	خريف	UHS XXX	Humanities Elective III	اختياري	جامعة	2	2	0	0

5. Academic Standards

The program adopted the NARS 2018 (2nd Edition) issued by the NAQAAE for the engineering sector. In addition to Level A and Level B, the program prepared and approved the competencies for Level D.

- **Adopted Academic Standards NARS**
- **Level A: The engineering graduate must be able to:**

A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics.
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.
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.
A4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
A5. Practice research techniques and methods of investigation as an inherent part of learning.
A6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.

A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
A8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
A10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

- **Level B: The engineering graduate must be able to:**

B1. 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.
B2. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.
B3. Plan and manage construction processes; address construction defects, instability and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects.
B4. Deals with biddings, contracts and financial issues including project insurance and guarantees.

Adopted Academic Standards ARS

- **Level D: The engineering graduate must be able to:**

D1. 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.
D2. Generate ecologically responsible environmental conservation and rehabilitation designs, through an understanding of structural design, construction, technology, and engineering problems

- **Date of Adoption of Standards in the governing Council: 11/12/2019**
  *** Decision/Minutes of the governing Council to be attached**

Faculty council number (461**) dated** 18/11/**2025**
Approved in the Department Board Meeting Number (78**) on** 7/10/**2025**

Approved in the Faculty Board Meeting Number (461**) on** 18/11/**2025**

6. Matrix of Academic Standards (Program Outcomes POs) with Courses

Compulsory courses

Compulsory Courses		Academic Standards															
		NARS														ARS	
Code	Title	A1	A2	A3	A4	A 5	A6	A7	A8	A9	A10	B1	B2	B3	B4	D1	D2
UHS 101	Foreign Language								1		1						
UHS 102	Information and Communication Technology				1						1						
UHS 103	Social issues							1			1						
UHS 104	Professional Ethics				1	1											
UHS XXX	Humanities Elective I			1	1												
UHS XXX	Humanities Elective II								1	1							
UHS XXX	Humanities Elective III					1					1						
FRB 001	Analytical geometry & Linear Algebra	1		1													
FFB 002	Integration & Multivariable functions	1		1													
FRB 101	Engineering Differential Equations	1	1														
FRB 104	Engineering Numerical Analysis	1	1														
FRB 201	Applied Engineering Probability and Mathematical Statistics	1	1														
FRB 007	Chemistry for Engineers	1	1														
FRB 103	Environmental Pollution and Industrial Safety	1	1		1												
FRB 102	Water Chemistry	1		1	1												
FRB 005	Waves and Heat	1	1														
FRB 006	Electricity and Magnetism	1	1														
FRM 009	Engineering Drawing						1		1								
FRM 008	Production Systems Engineering				1		1										
FRM 010	Engineering Drawing by Computer				1					1							
FRE 012	Computer Programming Fundamentals	1		1													
FRB 003	Statics	1	1														
FRB 004	Dynamics	1	1														
CMC106	Construction Engineers Drawing								1				1				
CMC101	Structural Analysis-1	1										1					
CMC102	Structural Analysis-2	1										1					
CMC 201	Hydrology and Water Resources	1										1	1				
CMC 103	Properties and Testing of Construction Materials		1									1					
CMC 104	Construction Materials and Concrete Technology		1									1					
CMC 105	Surveying for Engineers-1		1					1				1					
CMC 108	Surveying for Engineers-2					1						1					

Compulsory Courses		Academic Standards															
		NARS														ARS	
CMM 301	Technical Installations in Buildings		1	1		1						1					1
CMA 107	Basic Architectural Engineering								1							1	
CMA 110	Building Construction					1			1								1
CMA 210	Introduction to City Planning						1									1	1
CMC 109	Fluid Mechanics	1	1									1					
CMC 112	Hydraulics for Construction Engineers		1	1								1					
CMC 401	Project Finance & Management		1				1							1	1		
CMC 203	Soil Mechanics		1			1						1					
CMC 204	Geotechnical Engineering and Foundations		1	1								1	1				
CMC 305	Design and Construction of Foundations & Earth Retaining Structures			1									1				1
CMC 205	Design of Metallic Structures-1			1	1								1				1
CMC 207	Design of R.C. Structures-1			1	1								1				1
CMC 208	Design of R.C. Structures-2			1	1								1				1
CMC 309	Quality Control & Inspection of Structures						1			1				1		1	
CMC 206	Construction Project Management						1	1		1				1	1		
CMC 307	Cost Engineering & Quantity Surveying						1							1	1		
CMC 306	Project Planning, Scheduling, and Control		1				1							1	1		
CMC 403	Construction Project Specifications, Bids, and Contracts						1							1	1		
CMC 302	Sanitary Engineering		1										1				
CMC 202	Transportation and Traffic Engineering	1	1			1							1	1			
CMC 303	Methods and Equipment for Construction					1	1					1					
CMC 304	Construction and Site Safety				1		1							1		1	
CMC 308	Senior Design Project I			1	1		1	1	1	1	1	1	1	1	1	1	1
CMC 405	Senior Design Project II			1	1		1	1	1	1	1	1	1	1	1		1
FT 103	Field Training I							1			1						
FT 203	Field Training II							1			1						
Total																	

Elective courses

Elective Courses		Academic Standards															
		NARS														ARS	
Code	Title	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	D1	D2
CMC 3XX	Program Elective Courses I																
CMA 311	Building Technology				1	1						1		1			1
CMC 313	Highway Facilities				1	1						1		1			1
CMC 315	Bridge Building Technology				1	1						1		1			1
CMC 3XX	Program Elective Courses II																
CMC 310	Value Engineering in the Construction Industry						1							1	1		
CMC 312	Engineering Economy						1							1	1		
CMC 314	Construction Quality Management						1							1	1		
CMC 3XX	Program Elective Courses III																
CMC 316	Dynamics of Structures			1									1				1
CMC 318	Design of Metallic Structures-2			1									1				1
CMC 320	Prefabricated Water and Prestressed Concrete Structures			1									1				1
CMC 4XX	Program Elective Courses IV																
CMC407	Engineering for Sustainable Environment			1	1									1			
CMC409	Environmental Engineering			1	1									1			
CMC 411	Special Topics in Structural Analysis			1	1									1			
CMC 4XX	Program Elective Courses V																
CMC413	Advanced Engineering Materials										1					1	1
CMA415	Finishing Materials Technology										1					1	1
CMA417	Principles and Approaches of Smart Cities										1					1	1
CMC 4XX	Program Elective Courses VI																
CMC 419	Modeling and Simulation of Construction Systems							1		1	1	1					1
CMC 421	Geographic Information System GIS							1		1	1	1					1
CMC 423	Modeling of structures							1		1	1	1					1

7. Teaching and Learning strategies/methods to achieve Program Outcomes:

1. Lecture (problem-based learning- interactive learning – case study – co-operative learning – brainstorming - discussion)
2. Tutorials
3. Practical-based Learning
4. Projects
5. Self-Learning
6. Hybrid Learning

8. Student Assessment strategies/methods to verify and ensure students' acquisition of Program Outcomes:

1. Formative Assessment Method: quizzes
2. Summative Assessment Method
   a. First midterm: 30%
   b. Second midterm (practical/ oral or both in case the course includes a practical part): 20%
   c. Student activities: 10 % (Presentations, Reports, projects, assignments, observation)
   d. Final exam: 40%

9. Program Key Performance Indicators

No.	Performance Indicator	Target Level	Method	Measurement
1.	Students' evaluation and opinions on courses	Students	Electronic Survey	End of Semester
2.	Faculty members' evaluation and opinions on laboratories	Faculty Members	Electronic Survey	End of Semester
3.	Faculty members' evaluation and opinions on classrooms	Faculty Members	Electronic Survey	End of Semester
4.	Students' evaluation and opinions on laboratories	Students	Electronic Survey	End of Semester
5.	Students' evaluation and opinions on classrooms	Students	Electronic Survey	End of Semester
6.	Students' evaluation and opinions on the library	Students	Electronic Survey	End of Academic Year
7.	Students' evaluation and opinions on admission and transfer policies	Students	Electronic Survey	Beginning of Semester
8.	Students' evaluation and opinions on hybrid learning	Students	Electronic Survey	End of Semester
9.	Students' evaluation and opinions on the Programs Board Chairman	Students	Electronic Survey	End of Semester
10.	Students' evaluation and opinions on the General Programs Supervisor	Students	Electronic Survey	End of Semester
11.	Students' evaluation and opinions on the Program Coordinator	Students	Electronic Survey	End of Semester
12.	Students' evaluation and opinions on academic advising	Students	Electronic Survey	End of Semester
13.	Faculty members' evaluation and opinions on the Programs Board Chairman	Faculty Members	Electronic Survey	End of Semester

No.	Performance Indicator	Target Level	Method	Measurement
14.	Faculty members' evaluation and opinions on the General Programs Supervisor	Faculty Members	Electronic Survey	End of Semester
15.	Faculty members' evaluation and opinions on the Program Coordinator	Faculty Members	Electronic Survey	End of Semester
16.	Faculty members' evaluation and opinions on the Program Quality Coordinator	Faculty Members	Electronic Survey	End of Semester
17.	Administrative staff evaluation and opinions on the Programs Board Chairman	Administrative Staff	Electronic Survey	End of Semester
18.	Administrative staff evaluation and opinions on the General Programs Supervisor	Administrative Staff	Electronic Survey	End of Semester
19.	Administrative staff evaluation and opinions on the Program Coordinator	Administrative Staff	Electronic Survey	End of Semester
20.	Employers' evaluation and opinions on program graduates	Employers	Electronic Survey	Academic Year
21.	Training organizations' evaluation and opinions on students	Training Organizations	Electronic Survey	After Field Training
22.	Field training supervisors' evaluation and opinions on students	Field Training Supervis	Electronic Survey	After Field Training
23.	Students' evaluation and opinions on field training	Students	Electronic Survey	After Field Training
24.	Civil society views on the program mission and objectives	Civil Society	Electronic Survey	Academic Year
25.	Faculty members' views on the program mission and objectives	Faculty Members	Electronic Survey	Academic Year
26.	Students' views on the program mission and objectives	Students	Electronic Survey	Academic Year

Name & Signature
Program Coordinator

Dr Ahmed Gamal M. Morsi



Name & Signature
Vice Dean for Education and Student Affairs

Prof Dr Fahmy Abdelhaleem

