Future University In Egypt

Faculty of Engineering and Technology

STRUCTURAL ENGINEERING AND CONTRACTION MANAGEMENT PROGRAM

PROGRAM SPECIFICATIONS

2021 Bylaw

2024-2025

Table of Contents

Program Specifications of

B.Sc. in Structural Engineering and Construction Management 2024/2025

A- BASIC INFORMATION

1. **Program title :** B. SC. in Structural Engineering and Construction Management
2. **Program type:** Single
3. **Faculty:** Engineering & Technology
4. **Department :** Structural Engineering and Construction Management
5. **Coordinator:** Assistant Prof. Ahmed Ebid
6. **External evaluator(s) :** Prof. Yasser El Saeey
7. **Internal evaluator(s) :** Prof. Samir Sadek
8. **Head of Department :** Prof. Ibrahim Mahdi
9. **Program by lows approval:** Jan. 2022
10. **Last date of program specifications approval:** Sep. 2024

B- PROFESSIONAL INFORMATION

[1] THE PROGRAM AIMS

The main objective of the "Structural Engi neering and Construction Management" program at the "Faculty of Engineering and T echnology" in "Future University in Egypt" is to graduate an engineer that has t he ability to practice a leading and success ful engineering career in s tructural engineering and constr uction management profession and in his own society. To achieve t his objective, the program aims were guided by **(NARS 2018) and Structural Engineering & Construction Management ARS as follows:**

NARS 2018				ARS
Level A:		Level B:		Level D:
General Engineering	+	Civil Engineering Arch. Engineering	=	Structural Engineering & Construction Management

to graduate an engineer which is able to:

PA1. Identify, formulate, and solve complex structural engineering and construction management problems by applying principles of engineering, science, and mathematics.

PA2. Apply structural engineering and construction management design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
PA3. Communicate effectively with a range of audiences.
PA4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of structural engineering and construction management solutions in global, economic, environmental, and societal contexts.
PA5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
PA6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
PA7. Acquire and apply new knowledge as needed, using appropriate learning strategies.
PA8. Use techniques, skills and modern engineering tools necessary for structural & construction management engineering practice.
PA9. Demonstrate leadership qualities, business administration and entrepreneurial skills.
PA10. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community.

To achieve these aims, the program is designed to target the following Outcomes.

[2] PROGRAM OUTCOMES

PO1. Apply knowledge of basic sciences, mathematics, and engineering fundamentals to identify, formulate, diagnose, and solve complex engineering problems.
PO2. Design and conduct appropriate experiments and/or perform simulations, collect, analyze and interpret data, assess and evaluate findings, and use statistical analysis and objective engineering judgment to draw conclusions.
PO3. Apply engineering design to produce cost-effective solutions that meet specified needs with consideration of public health, safety, ethics, aesthetics and welfare, as well as global, cultural, social, environmental, and economic factors, and promote sustainability and development.
PO4. Utilize contemporary technologies, engineering standards and codes of practice, quality measures, health and safety requirements, environmental considerations, and principles of risk management.
PO5. Utilize relevant literature, combine, exchange, and assess different ideas, views, and knowledge from a range of sources, investigate and analyze results of engineering models to come to useful conclusions for the benefit of research and development.

PO6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.

PO7. Function effectively on a team of multidisciplinary and/or multicultural members who together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

PO8. Utilize contemporary tools to communicate effectively (verbally, graphically, and in writing) with a wide range of audiences having different backgrounds.

PO9. Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.

PO10. Acquire and apply new knowledge, and practice self, lifelong and other learning strategies.

PO11. Select appropriate and sustainable technologies for construction of buildings, 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, Soil Mechanics

PO12. Select appropriate and sustainable technologies for construction of infrastructures and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of Surveying, Hydrology and Fluid Mechanics.

PO13. Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures

PO14. Achieve an optimum design of Transportation and Traffic, Roadways Sanitary Works, Irrigation systems

PO15. 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

PO16. Deal with biddings, contracts and financial issues including project insurance and guarantees.

PO17. Deal with construction projects financing, cost control and methods of project delivery; while having adequate knowledge of industries, organizations, regulations

[3] Academic standards

Structural engineering and construction management department has prepared an Academic Standard for the program guided by (**NARS-2018) for Engineering, Civil Engineering and Arch Engineering**.

[4] Benchmarks

NARS 2018				**ARS**
Level A:		Level B:		Level D:
General Engineering	+	Civil Engineering Arch. Engineering	=	Structural Engineering & Construction Management

[5] Curriculum Structure and Contents

5.1 Program duration:

Min. 8 semesters & Max.20 semesters, 164 Cr.Hrs.

5.2 Program structure

Credit Hours & Student Workload (SWL)
for Graduation Requirements' Categories

Graduation Requirements' Category	Credit Hours (CH)	SWL / CH / Week*	SWL / Category / Week	Total SWL / Category
University Requirements	13	2	26	416
Faculty Requirements	32	2.7	86.4	1382
Specialty Requirements	119	3	357	5712
Sub-Specialty Requirements				
CH / Program	164	SWL / Program		7510
Average SWL / Semester	750	Average ECTS / Semester		30

***Calculation of SWL / CH / Week for each Category**
(For most of the courses of the category)

Category	CH	Structured SWL / Course / Week		Unstructured SWL / Course / Week	Total SWL / Course / Week	SWL / CH / Week
		Lecture	Tut/Lab			
University Req.	2	2	0	2	4	2
Faculty Req.	3	2	2	4	8	2.7
Specialty & Sub-specialty Req.	3	2	2	5	9	3

Overall Data of the Programs

NC	Credits and SWL			Total Contact Hours				4 Requirements				BS%
	CH	SWL	ECTS	Lec	Tut	Lab	TT	UR%	FR%	DR%	PR%	
62	164	750	30	123	107	14	244	8%	20%	72%		24%

Lec	Total Lecture hours	CH	Total Credit Hours	FR	Faculty Requirement
Tut	Tutorial hours	SWL	Total Student Workload	DR	Discipline Requirement
Lab	Laboratory hours	NC	Total number of Courses	PR	Program Requirement
TT	Total contact hours	UR	University Requirement	BS	Basic Sciences Percentage
ECTS	European Credit Transfer System				

5.3 Program Courses

A- UNIVERSITY REQUIREMENTS (13 credit hours)

Compulsory Courses List (9 credit hours)

No.	Code	Course Title	CH
1	CSC 101	Introduction to Computers	2
2	ENG KET	English KET	2
3	ENG PET	English PET	2
4	GEN201	Practical Training 1	0
5	GEN301	Practical Training 2	0
6	GEN401	Practical Training 3	1
7	PSC 110	Human Rights	2

Elective Courses List (4 credit hours)

No.	Code	Course Title	CH
1	BSA H01	Administration of Small Projects	2
2	ENV 101	Environmental Science	2
3	HUM H09	Specific Computer Applications	2
4	PSC 101	Psychology	2
5	SCT 101	Scientific Thinking	2
6	SOC 101	Sociology	2

B - FACULTY REQUIREMENTS (32 credit hours)

No.	Code	Course Title	CH
1	EED160	Computer Programming	2
2	EMP111	Differentiation with Applications and Algebra	3
3	EMP112	Integration with Applications and Analytical Geometry	3
4	EMP121	Properties of Matter and Thermodynamics	4
5	EMP122	Electricity and Magnetism	4
6	EMP130	Engineering Mechanics	4
7	EMP140	Engineering Graphics	4
8	EMP150	General Chemistry	2
9	GENx11	Communication and presentation skills	2
10	GENx12	Engineering Ethics and Legislations	2
11	MEC161	Production Technology	2

C - DEPARTMENT REQUIREMENTS (119 credit hours)

Compulsory Courses List (106 credit hours)

No.	Code	Course Title	CH	Prerequisite Courses
1	ARC349	Building Construction	2	--
2	EED204	Electrical Installations& Construction Equipment	2	EMP122
3	EMP211	Ordinary Differential Equations	4	EMP112
4	EMP212	Transformations & Numerical Analysis	4	EMP112
5	EMP312	Probability & Statistics	3	EMP211
6	EMP371	Geology	3	--
7	MEC241	Fluid Mechanics	3	EMP130
8	MEC260	Dynamics of Rigid Bodies	2	EMP130
9	SCM201	Civil Engineering Drawing 1	2	EMP140
10	SCM202	Civil Engineering Drawing 2	2	SCM201
11	SCM211	Structural Analysis 1	2	EMP130
12	SCM212	Structural Analysis 2	2	SCM211
13	SCM221	Strength and Technology of materials 1	3	--
14	SCM231	Planimetric Surveying	2	EMP112
15	SCM232	Topographic Surveying	2	SCM231
16	SCM313	Structural Mechanics 1	2	SCM212
17	SCM314	Structural Mechanics 2	2	SCM212
18	SCM315	Structural Mechanics 3	2	SCM314
19	SCM322	Strength and Technology of Materials 2	3	SCM221
20	SCM341	Hydraulics	3	MEC241
21	SCM342	Irrigation and Drainage Engineering.	3	MEC241
22	SCM351	Reinforced Concrete 1	3	SCM313
23	SCM352	Reinforced Concrete 2	3	SCM351
24	SCM361	Metallic Structures 1	3	SCM313
25	SCM381	Fundamentals of Construction Project Manag.	3	--
26	SCM382	Engineering Economics and Finance	2	--

27	SCM400	Graduation Project-1	1	As Advised
28	SCM401	Graduation Project-2	4	SCM400
29	SCM443	Environmental & Sanitary Engineering	3	SCM341
30	SCM453	Reinforced Concrete 3	3	SCM351
31	SCM462	Metallic Structures 2	3	SCM361
32	SCM472	Soil Mechanics	3	EMP371
33	SCM473	Foundations	3	SCM472
34	SCM483	Project Planning and Control	3	SCM381
35	SCM484	Quantity Surveying and Cost Estimation	3	SCM382
36	SCM485	Construction Engineering Contracts	3	SCM483
37	SCM489	Resource Management	3	SCM381
38	SCM491	Transport Planning & Traffic Engineering	3	--
39	SCM492	Highway and Airport Engineering	3	--

Ele ctive Courses List (14 credit hours)

No.	Code	Course Title	CH	Prerequisite Courses
1	SCMx16	Structural Mechanics 4	3	SCM314
2	SCMx17	Structural Dynamics & Earthquake Engineering	3	SCM315
3	SCMx23	Advanced Technology of Construction Materials	3	SCM322
4	SCMx24	Inspection and Repair of Structures	2	SCM322
5	SCMx33	Geographic information systems GIS	2	SCM232
6	SCMx34	Photogrammetry & Setting out	2	SCM232
7	SCMx54	Reinforced Concrete 4	3	SCM352
8	SCMx55	Reinforced Concrete 5	3	SCM352
9	SCMx63	Metallic Structures 3	3	SCM361
10	SCMx64	Metallic Bridges	2	SCM361
12	SCMx86	Construction Project Risk Management	2	SCM381
13	SCMx87	Value Engineering in Construction Projects	2	SCM382
14	SCMx88	Construction Technology	2	SCM381

5.4 Program Study Plan (Suggested Schedule)

First Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	CSC 101	Introduction to Computers	2	0	0	2	2	
2	EMP111	Differentiation with Applications & Algebra	2	2	0	4	3	
3	EMP121	Properties of Matter & Thermodynamics	3	2	1	6	4	
4	EMP140	Engineering Graphics	2	6	0	8	4	
5	EMP150	General Chemistry	2	1	0	3	2	
6	ENG KET	English KET	2	0	0	2	2	
		Total	**13**	**11**	**1**	**25**	**17**	

Second Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	EED160	Computer Programming	1	0	2	3	2	CSC 101
2	EMP112	Integration with Applications & Analytical Geometry	2	2	0	4	3	EMP111
3	EMP122	Electricity & Magnetism	3	2	1	6	4	
4	EMP130	Engineering Mechanics	4	2	0	6	4	
5	MEC161	Production Technology	1	0	3	4	2	
6	PSC 110	Human Rights	2	0	0	2	2	
		Total	**13**	**6**	**6**	**25**	**17**	

Level 2 (Sophomore)

Third Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	EED204	Electrical Installations and Construction Equipment	2	1	0	3	2	EMP122
2	EMP211	Ordinary Differential Equations	3	2	0	5	4	EMP112
3	ENG PET	English PET	2	0	0	2	2	ENG KET
4	MEC260	Dynamics of Rigid Bodies	2	1	0	3	2	EMP130
5	SCM201	Civil Engineering Drawing 1	1	3	0	4	2	EMP140
6	SCM211	Structural Analysis 1	2	1	0	3	2	EMP130
7	SCM231	Planimetric Surveying	2	0	1	3	2	EMP112
Total			**14**	**8**	**1**	**23**	**16**	

Fourth Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	EMP212	Transformations and Numerical Analysis	3	2	0	5	4	EMP112
2	SCM202	Civil Engineering Drawing 2	1	3	0	4	2	SCM201
3	SCM212	Structural Analysis 2	2	1	0	3	2	SCM211
4	SCM221	Strength and Technology of materials 1	2	2	1	5	3	--
5	SCM232	Topographic Surveying	2	0	1	3	2	SCM231
6	UNV E01	University Elective Course 1	2	0	0	2	2	--
7	UNV E02	University Elective Course 2	2	0	0	2	2	--
Total			***13***	***9***	***2***	***24***	***17***	

Summer Training 1

No	Course		Contact Hours	CH	Prerequisite Courses
	Code	Title			
1	GEN201	Practical Training 1	80 Contact Hours (2 Weeks × 40 hrs/Week)	0	Completion of 50 CH

Level 3 (Junior)

Fifth Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	EMP371	Geology	2	2	1	5	3	--
2	EMP312	Probability & Statistics	2	2	0	4	3	EMP211
3	MEC241	Fluid Mechanics	2	2	1	5	3	EMP130
4	SCM313	Structural Mechanics 1	2	1	0	3	2	SCM212
5	SCM322	Strength and Technology of Materials 2	2	2	1	5	3	SCM221
6	SCME01	Dept. Elective 1	2	1	0	3	2	See list
Total			**12**	**10**	**3**	**25**	**16**	

Sixth Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	ARC349	Building Construction	2	1	0	3	2	--
2	GENx14	Communication and presentation skills	2	1	0	3	2	--
3	GENx15	Engineering Ethics and Legislations	2	0	0	2	2	--
4	SCM314	Structural Mechanics 2	2	1	0	3	2	SCM212
5	SCM351	Reinforced Concrete 1	2	3	0	5	3	SCM313
6	SCM381	Fundamentals of Construction Project Management	2	3	0	5	3	--
7	SCM382	Engineering Economics and Finance	2	1	0	3	2	--
Total			**14**	**10**	**0**	**24**	**16**	

Summer Training 2

No	Course		Contact Hours	CH	Prerequisite Courses
	Code	Title			
1	GEN301	Practical Training 2	80 Contact Hours (2 Weeks × 40 hrs/Week)	**0**	GEN201

Level 3 (Junior) – *Continued*

Seventh Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	SCM315	Structural Mechanics 3	2	1	0	3	2	SCM314
2	SCM341	Hydraulics	2	3	0	5	3	MEC241
3	SCM342	Irrigation and Drainage Engineering.	2	2	0	2	3	MEC241
4	SCM352	Reinforced Concrete 2	2	3	0	5	3	SCM351
5	SCM361	Metallic Structures 1	2	3	0	5	3	SCM313
6	SCME02	Dept. Elective 2	2	1	0	3	2	See list
Total			**12**	**13**	**0**	**25**	**16**	

Level 4 (Senior)

Eighth Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	SCM453	Reinforced Concrete 3	2	3	0	5	3	SCM351
2	SCM462	Metallic Structures 2	2	3	0	5	3	SCM361
3	SCM472	Soil Mechanics	2	1	1	4	3	EMP371
4	SCM483	Project Planning and Control	2	3	0	5	3	SCM381
5	SCME03	Dept. Elective 3	2	1	0	3	2	See list
6	SCME04	Dept. Elective 4	2	1	0	3	2	See list
Total			**12**	**12**	**1**	**25**	**16**	

Summer Training 3

No	Course		Contact Hours	CH	Prerequisite Courses
	Code	Title			
1	GEN401	Practical Training 3	80 Contact Hours (2 Weeks × 40 hrs/Week)	1	GEN301

Level 4 (Senior) – *Continued*

Ninth Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	SCM400	Graduation Project-1	0	2	0	2	1	As Advised
2	SCM443	Environmental and Sanitary Engineering	2	3	0	5	3	SCM341
3	SCM473	Foundations	2	3	0	5	3	SCM472
4	SCM491	Transport Planning and Traffic Engineering	2	2	0	4	3	--
5	SCME05	Dept. Elective 5	2	2	0	4	3	See list
6	SCM E06	Dept. Elective 6	2	2	0	4	3	See List
Total			**10**	**14**	**0**	**24**	**16**	

Tenth Semester

No	Course		Weekly Contact Hours				CH	Prerequisite Courses
	Code	Title	Lec.	Tut.	Lab.	Total		
1	SCM401	Graduation Project-2	2	4	0	6*	4	SCM400
2	SCM484	Quantity Surveying and Cost Estimation	2	2	0	4	3	SCM382
3	SCM485	*Construction Engineering Contracts*	2	3	0	5	3	SCM483
4	SCM489	Resource Management	2	2	0	4	3	SCM381
5	SCM492	Highway and Airport Engineering	2	3	0	5	3	--
Total			**10**	**14**	**0**	**24**	**16**	

**This number does not account for the contact hours during the four weeks following the final exams*

[6] PROGRAM ADMISSION REQUIREMENTS

Students eligible for enrollment in the Facu lty are those holding the Egyptian General Secondary Education Certificate (Thanaweya Amma) or any equiv alent certificate, or those transferred from other universities, in acc ordance with the rules and conditions issued annually by the Egyptian Council of Private and Community Universities (CPU).

[7] REGULATIONS FOR REGISTRATION, PROGRESSION AND PROGRAM COMPLETION

7.1 Academic Advising

The Academic Advisor is a Faculty member who is assigned the duty of counseling and monitoring a group of students. The academic advisor is responsible for assisting the student in selecting his academic track as well as in selecting courses for each semester. The academic advisor may ask the student to repeat courses which he/she already passed to raise his/her Cumulative Grade Point Average (CGPA) to that required for graduation. Also, the academic advisor assists the student in selecting the practical training and graduation project.

7.2 Registration Procedure

- In a main semester (Fall or Spring), the academic load of the student, which he/she selects with the help of the academic advisor, may reach:
  a. Up to 21 credit hours for students with Cumulative Grade Point Average (CGPA) greater than or equal to 3.0.
  b. Up to 18 credit hours for students with CGPA greater than or equal to 2.0.
  c. Up to14 credit hours for students with CGPA less than 2.0.
- During the final semester of his/her study, the student can register an overload of no more than 3 CH over the upper limits mentioned before, based on the academic advisor's recommendation and approval of the Dean.
- In the Summer semester, the student may register up to 7 credit hours for any student, regardless of his/her CGPA.

7.3 Course Withdrawal and Addition

A student may add/drop courses within the first two weeks of a main semester, or the first week in a Summer semester, without incurring any penalty. After such time and no later than the 12th week of a main semester, or the 4th week of a Summer semester, a student may withdraw registered courses. In this case, the course(s) fees will not be refunded; nonetheless, the student is given a Withdrawn grade (W), and his/her CGPA will not be affected on account of such course(s) withdrawal.

If the student did not attend the final exam of the course with an excuse accepted by the Faculty Council, he/she gets a final grade Incomplete (I) in this course. The grade "I" is not included in calculating the Cumulative Grade Point Average (CGPA). In this case, the final exam will be postponed for the student till the beginning of the next semester while the student's semester work marks are kept. If the student didn't attend the final exam on the announced date without an excuse accepted by the Faculty Council, he/she gets a Fail (F) grade in the final examination.

7.4 Attendance and Absence

The student is required to attend all classes of the course he/she registers for. A student who is absent for more than 15% of the total contact hours of the course without an acceptable excuse is given an academic warning. A student who is absent for more than 25% of the course hours without a valid excuse accepted by the Faculty Council shall be deprived from taking all the following activities and/or examinations scheduled for that course and shall be given a Fail (F) grade.

The student can withdraw from a course if his absence ratio exceeds 25% during the first 12 weeks of the semester. If the absence ratio exceeds 25 % after the first 12 weeks, the student will not be allowed to withdraw the course

If the student did not attend the final exam of the course with an excuse accepted by the Faculty Council, he/she gets a final grade Incomplete (I) in this course. The grade "I" is not included in calculating the Cumulative Grade Point Average (CGPA). In this case, the final exam will be postponed for the student till the beginning of the next semester while the student's semester work marks are kept. If the student didn't attend the final exam on the announced date without an excuse accepted by the Faculty Council, he/she gets a Fail (F) grade in the final examination.

7.5 Semester Withdrawal

- The student has the right to withdraw from an academic semester within the withdrawal period, announced in the academic calendar of the semester.
- The student will be considered failed if he/she withdraws after the withdrawal period unless he/she has a valid reason which is accepted by the Faculty Council

7.6 System of Examinations

A. The Marks of a given course (100 Marks) are distributed on the semester's work and the final exam according to the nature of the course. The assessment policy must be declared to the students through course syllabus before the start of the course. Most of the Faculty courses comply with the regular assessment scheme of marks distribution, given below:

A1. Final Exam

The final exam constitutes 40 Marks. It shall be a comprehensive exam covering all course topics.

A2. Midterm Exam

The midterm exam constitutes 30 Marks. It shall be conducted during the 8th-9th weeks. Exam date should be announced to students. The graded midterm exam and its model answer should be discussed in class.

A3. Other assessment components

Other assessment components , which constitute 30 Marks, include: Quizzes, Assignments, Practical exams (if exist), Oral exams (if any), Course report/ project (if any), student's Performance and Participation

B. Courses not complying with the regular assessment scheme of item (A) are characterized by adding a row, containing the adopted marks di stribution, to the corresponding table of the course description of this Bylaw.

C. The distribution of marks of a course can be modified after the approval of the Faculty Council based on a proposal by the Scientific Department offering that course

7.7 Grading System

- There are two conditions to pass a regular course:
  1- The student must attend the final exam and obtain at least 40% of its grade.
  2- The overall marks of the student for all assessment components of the course must be at least 60 Marks out of 100 Marks.
- For non-credit courses (0 CH), the earned gr ade is either Pass or Fail (P/F). Pas s grade means the student obtained at least 60% of the course marks. The grade of non-credit courses shall not be included in the CGPA calculation.
- The following grading system is adopted by the Faculty for all the offered courses

Grade	Percentage Marks	Grade Points	Grade	Percentage Marks	Grade Points
A+	97% and higher	**4.0**	**C+**	73% to less than 76%	**2.3**
A	93% to less than 97%	**4.0**	**C**	70% to less than 73%	**2.0**
A-	89% to less than 93%	**3.7**	**C-**	67% to less than 70%	**1.7**
B+	84% to less than 89%	**3.3**	**D+**	64% to less than 67%	**1.3**
B	80% to less than 84%	**3.0**	**D**	60% to less than 64%	**1.0**
B-	76% to less than 80%	**2.7**	**F**	Less than 60%	**0.0**

- In addition to the regular grades, the non-credit grades are

Grade	Meaning	Description
P/F	Pass/Fail	Grades for non-credit hour courses
I	Incomplete	According to the conditions of Article (10)
W	Withdrawn	According to the conditions of Article (11)

- The Course points are the result of multiplying the grade points the student earned for that course by the credit hours of the course.
- The Grade Point Average (GPA) is calculated by dividing the total number of semester course points by the total number of semester hours attempted as follows:

$$GPA = \frac{\sum CH\ of\ each\ semester\ course \times course\ points}{\sum CH\ of\ graded\ semester\ course}$$

- The Cumulative Grade Point Average (CGPA) is calculated by dividing the total number of course points accumulated by the total number of credit hours attempted, as follows

$$CGPA = \frac{\sum CH\ of\ each\ course\ attempted \times course\ points}{\sum CH\ of\ graded\ course\ s}$$

7.8. Failure and Re-registration of Courses

Repeating a course requires attending all its activities, including lectures, exercises, and exams. Two cases are considered for course repeating:

A. Retaking a passed Course

A student may repeat a previously passed course, aiming to improve his/her CGPA, subject to the following conditions:

A1. The student will get the highest grade among the two attempts, and this grade will be used in the calculation of the CGPA. All grades will appear in the academic record.

A2. The student may improve a maximum of 5 courses during the program study duration, excluding the extra courses required for getting out of the academic warning or satisfying the graduation requirements.

A3. If the student fails in the retake for improvement, without a valid excuse accepted by the Faculty Council, the grade of the first take will be disregarded, and he/she will get the Fail grade (F).

B. Retaking a Failed Course

A student who completes a course with failing grade (F) is subject to the following conditions:

B1. Fail grade (F) for any course shall be recorded on the student's transcript and is counted in the calculation of the semester GPA and CGPA, whether the course is compulsory or elective.

B2. If a student fails a compulsory course in any semester, he/she must retake this course in a subsequent semester.

B3. If the student fails an elective course, he/she may retake the same course or another elective course, after the approval of his/her academic advisor.

B4. When the student passes a previously failed course, the highest grade recorded for him/her is B+.

7.9. Students with GPA less than 2.0

- If the CGPA of a student drops below 2.0, he/she is placed under probation and is not allowed to register more than 14 credit hours per semester until his/her CGPA reaches 2.0 at least. A written warning should be sent to the student under probation and a copy of it is forwarded to his/her parents or guardians.
- The student will be dismissed from the university under the following situations:

- o If his/her CGPA drops below 2.0 throughout F IVE consecutive semesters, excluding Summer semesters.
- o If the student did not achiev e the graduation requirements through the maximum allowed study duration.

• In dismissal situations, the student may apply to the Dean an appeal for continuing the study, support ed by documents of his/her social and/or healt h condition. The Dean shall disc uss the appeal with the Faculty Counc il. For a student who has successfully completed 80% of graduation r equirements, the Faculty Council may give him/her a last chance of TWO extra main consecutive semesters to improve hi s/her CGPA before he/she is finally dismissed.

7.10. Graduation Requirements

To be awarded the Bachelor of Science (B.Sc.) Degree in Engineering and Technology, students must successfully complete 164 credit hours with a Cumulative Grade Point Average (CGPA) of 2.0 (C) or higher.

To obtain the Rank of Honor, the student must:

- have a GPA not less than 3.3 in all study semesters,
- have not failed any course during the duration of the program,
- have no disciplinary sanctions (punishment) imposed on him during the duration of the program.

Graduation Project

The Graduation Project represents the cr owning achievement of an Engineering student's undergraduate exper ience. The s tudent will be eligible to register the first course of the graduat ion project upon c ompleting not less than 120 CH. T he Faculty Council may permit decreasing this limit t o 115 CH upon a request by the Academi c Advisor and subject to special cases. The graduation project spans two main semesters.

Graduation projects apply both engineering knowledge and skills to the s olution and design of real-world applic ations. The work done has to be based on the k nowledge and skills acquired dur ing the course work. The first part of the project should include a survey of the project subject area with refe rence to appropriate liter ature, and the tim e schedule for the design and implementation phas es of the project. The project is considered as a decis ion-making process in which the basic sc ience and mat hematics as well as engineering sciences are integrated to conv ert resources optimally to meet a stated objective. Among the fundamental elements of t he design process are the establishment of objectives and criteria, synthesis, analysi s, construction, testing and evaluation. The student has to take into consideration the a ppropriate engineering standards and multiple constraints during the different phases of the project.

The engineering design must include most of the following features: development o f student creativity, use of open-ended problems, development and use of modern design theory and methodology, formulati on of design problem statements and specification, consideration of alternative solutio ns, feasibility considerations, concurrent engineering design, and detailed syste m description. Further, it is essential

to include a variety of realistic constraints, such as economic factors, safety, reliability, aesthetics, ethics and social impact.
One extra month after the end of the second semester is available for the students to finalize their work. The supervisor evaluates the contribution of each student during the different phases of the project. A printed version of the project report beside the final product of the project work should be submitted to the Department prior to the date of discussion. The jury members from academy and industry evaluate the student work based on a submitted documents and final product, oral presentation and discussion. In case the student failed in the project, he/she is given a grace semester and will be eligible to present and defend the project by the end of the grace semester.

7.11 Change of Specialization

- To be eligible to join a study program, the student must earn at least 18 credit hours with a CGPA greater than or equal to 1.0.
- Every new academic year, the Faculty Council establishes general rules for the distribution of students eligible to the different programs considering:
    - the student preferences
    - the principle of equal opportunities
    - the requirements stated by the department offering the program
    - the available capacity of the program
- The student may change his/her specialization or be required to change it by a university action based on:
    - the student's will, and/or the recommendations of the Academic Advisor
    - approval of the Faculty Dean

7.12 Scientific Visits

The Faculty may arrange scientific visits for the students to industrial, construction and service centers under supervision of the faculty members. These visits are subsidized by the University.

7.13 Practical Training

Practical training is a part of all the study programs of the Faculty. The overall duration of the training is 240 hours, divided over 3 modules (80 hours each), and should be carried out during two or three summer semesters at one or more engineering facilities (inside or outside Egypt). The training program shall be related to the specialization of the study program in which the student is registered and must be approved by the scientific department offering the program. The student is eligible to register the first training module after completing the courses of Level Two (or a minimum of 50 CH). The student may practice at most one on- campus training module (80 hours) offered by the Faculty. After completing each module, the student shall submit a report and conduct a presentation to be evaluated by the scientific department. The three training modules are equivalent to 1 CH.

7.14 Modification of Bylaw

The Faculty Council can perform some mi nor modifications on this Bylaw without referring to the Committee of Engineering Sector - Supr eme Council of Egyptian Universities. Examples of the possible modifications are:

- Adding elective courses
- Modification of course contents (not more than 50%)
- Modification of marks distribution of a course
- Modification of contact hours of a course without changing its credit hours.

7.15 Provisions of Bylaws

- Following the issuance of t he ministerial decree, and pr ovided that the necessary clearing procedure is made, th is bylaw s hall be ap plicable to new students to be admitted to the Fac ulty starting from Fall 2021, as well as t o the students alrea dy enrolled in the Faculty and earning 34 CH or less (Level -One students) by Fall 2021. The Faculty Council may add ot her student ca tegories to the above, based on a stud y conducted by the academic advisors, for t he purpose of appropriate implementation of these Bylaws.
- Any student, who is currently enrolled in the Faculty, can apply to the Dean requesting transfer to these By laws upon is suing the minist erial decree. If the Facult y Council approves his/her request, the necessary clearing procedure is made

[8] PROGRAM OUTCOMES 'S TEACHING & ASSESSMENT METHODS

The following methods are used in teaching for most cases. But for further details refer to the course's specifications.

- Interactive lecture
- Discussion
- Problem solving
- Lab. Experiments
- Projects
- Reports & presentations

The following methods are used to assess the program Outcomes in most cases. But for further details refer to the course's specifications.

- Written Exams
- Lab. Experiments
- Quizzes & Assignments.
- Projects
- Reports / Researches

[9] EVALUATION OF PROGRAM INTENDED LEARNING OUTCOMES

Evaluator	Tool	Sample
Faculty members	Final Exams Results	100%
Faculty members	Evaluation sheet	100%
Senior student	Questionnaire	20 to 25%
Alumni	Questionnaire	10 to 15%
Stakeholders	Questionnaire / interview	Represent different sectors
Internal Evaluator	Evaluation report	1
External Evaluator	Evaluation report	1

Appendices

- Table [1] matrix of Program Aims Vs. the Institute's Mission
- Table [2] Matrix of Program Aims Vs the NARS-2018 Engineers Attributes
- Table [3] matrix of Program Aims Vs. Program Outcomes
- Table [4] Matrix of "NARS-2018 Competencies Vs Program Outcomes
- Table [5] Matrix of Courses with Program Outcomes
- Table [6] program tree

Program coordinator:
Name: Dr. Ahmed Ebid
Signature:
Date: Sep. - 2024

Head of department:
Name: Prof. Ibrahim Mahdi
Signature:
Date: Sep. - 2024

Table [1] matrix of Program Aims Vs. the Institute's Mission

Institute's Mission	Program Aims									
	PA-1	PA-2	PA-3	PA-4	PA-5	PA-6	PA-7	PA-8	PA-9	PA-10
The Faculty of Engineering and Technology at Future University in Egypt provides a promising academic and cultural environment that enables the graduation of outstanding engineers who are capable of competing nationally and regionally	■	■				■	■	■		■
And well acquainted with the job market professionally and ethically.			■	■	■				■	
It also motivates conducting innovative scientific research		■			■					
And contributes to community serving and development.										■

Table [2] Matrix of Program Aims Vs the NARS-2018 Engineers Attributes

NARS 2018 Graduate's Attributes	PA-1	PA-2	PA-3	PA-4	PA-5	PA-6	PA-7	PA-8	PA-9	PA-10
1) Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;		■								
2) Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation	■									
3) Behave professionally and adhere to engineering ethics and standards				■						
4) Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance					■					
5) Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community										■
6) Value the importance of the environment, both physical and natural, and work to promote sustainability principles							■			
7) Use techniques, skills and modern engineering tools necessary for engineering practice								■		
8) Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies						■				
9) Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner			■							
10) Demonstrate leadership qualities, business administration and entrepreneurial skills									■	

Table [3] matrix of Program Aims Vs. Program Outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PO 14	PO 15	PO 16	PO 17
PA-1	■				■						■	■					
PA-2						■							■	■	■	■	■
PA-3								■									
PA-4			■														
PA-5							■										
PA-6		■															
PA-7										■							
PA-8				■							■	■	■	■	■	■	■
PA-9									■								
PA-10			■														

Table [4] Matrix of "NARS-2018 Outcomes Vs Program Outcomes

NARS-2018 Outcomes \ Program Outcomes		Level (A)										Level (D)						
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	PO16	PO17
General Engineering Level (A)	A1	■																
	A2		■															
	A3			■														
	A4				■													
	A5					■												
	A6						■											
	A7							■										
	A8								■									
	A9									■								
	A10										■							
Civil Eng. Level (B)	B1											■	■					
	B2													■	■			
	B3															■		
	B4																■	
Arch Eng. Level (B)	B1																	
	B2																	
	B3																	
	B4																	■
	B5																	

Table [5] Matrix of Courses with Program Outcomes

Code	Course	Level (A)										Level (D)						
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	PO16	PO17
CSC 101	Introduction to Computers	■			■						■							
ENG KET	English KET					■					■							
ENG PET	English PET					■												
GEN201	Practical Training 1						■	■						■	■	■	■	■
GEN301	Practical Training 2						■	■						■	■	■	■	■
GEN401	Practical Training 3						■	■						■	■	■	■	■
PSC 110	Human Rights			■				■										
BSA H01	Administration of Small Projects					■				■								
ENV 101	Environmental Science					■												
HUMH09	Specific Computer Applications					■				■								
PSC 101	Psychology					■												
SCT 101	Scientific Thinking					■												
SOC 101	Sociology					■												
EED160	Computer Programming	■			■													
EMP111	Differentiation with Applications & Algebra	■																
EMP112	Integration with App & Analytical Geometry	■																
EMP121	Properties of Matter & Thermodynamics	■	■					■										
EMP122	Electricity & Magnetism	■	■					■										
EMP130	Engineering Mechanics	■																
EMP140	Engineering Graphics	■					■		■									
EMP150	General Chemistry	■																

GENx11	Communication and presentation skills					■			■										
GENx12	Engineering Ethics and Legislations			■															
MEC161	Production Technology	■	■				■	■											
ARC349	Building Construction																		■
EED204	Electrical Installations & Construction Equip.											■							
EMP211	Ordinary Differential Equations	■																	
EMP212	Transformations and Numerical Analysis	■																	
EMP312	Probability & Statistics (Math 6)	■																	
EMP371	Geology	■	■					■											
MEC241	Fluid Mechanics		■										■						
MEC260	Dynamics of Rigid Bodies	■																	
SCM201	Civil Engineering Drawing 1								■										
SCM202	Civil Engineering Drawing 2								■										
SCM211	Structural Analysis 1	■										■							
SCM212	Structural Analysis 2	■										■							
SCM221	Strength and Technology of materials 1		■									■							
SCM231	Planimetric Surveying							■					■						
SCM232	Topographic Surveying							■					■						
SCM313	Structural Mechanics 1	■										■							
SCM314	Structural Mechanics 2	■										■							
SCM315	Structural Mechanics 3	■										■							
SCM322	Strength and Technology of Materials 2		■									■							
SCM341	Hydraulics		■										■						
SCM342	Irrigation and Drainage Engineering.			■											■				
SCM351	Reinforced Concrete 1				■									■					
SCM352	Reinforced Concrete 2				■									■					
SCM361	Metallic Structures 1				■									■					
SCM381	Fundamentals of Cons. Project Management						■									■			■
SCM382	Engineering Economics and Finance					■											■	■	

SCM400	Graduation Project-1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
SCM401	Graduation Project-2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
SCM443	Environmental and Sanitary Engineering			■										■				
SCM453	Reinforced Concrete 3				■									■				
SCM462	Metallic Structures 2				■									■				
SCM472	Soil Mechanics		■									■						
SCM473	Foundations			■	■									■				
SCM483	Project Planning and Control						■									■		
SCM484	Quantity Surveying and Cost Estimation					■										■		■
SCM485	Construction Engineering Contracts						■										■	■
SCM489	Resource Management						■									■		
SCM491	Transport Planning and Traffic Engineering			■											■			
SCM492	Highway and Airport Engineering			■											■			
SCMx16	Structural Mechanics 4	■										■						
SCMx17	Structural Dynamics & Earthquake Eng.	■			■							■						
SCMx23	Advanced Technology of Constr. Materials				■							■						
SCMx24	Inspection and Repair of Structures		■													■		
SCMx33	Geographic information systems GIS				■								■					
SCMx34	Photogrammetry & Setting out				■								■					
SCMx54	Reinforced Concrete 4				■									■				
SCMx55	Reinforced Concrete 5				■									■				
SCMx63	Metallic Structures 3				■									■				
SCMx64	Metallic Bridges				■									■				
SCMx86	Construction Project Risk Management						■									■		■
SCMx87	Value Engineering in Construction Projects					■										■	■	■
SCMx88	Construction Technology			■												■		

Table [6] Program tree