Northern Technical University

الجامعة التقنية الشمالية

Bachelor's degree (B.Sc.) – Building & Construction Tech. Eng.

بكالوريوس هندسة تقنيات البناء والانشاءات

Table of Contents | جدول المحتويات

1. Mission & Vision Statement

Vision Statement

The Department of Building and Construction Techniques Engineering strives for excellence and leadership in education and scientific research at the bachelor's, master's, and doctoral levels. The department aims to prepare outstanding technical engineers capable of keeping up with and advancing the rapidly evolving technology in the construction sector. It works to enhance scientific research and development through innovative research projects that contribute to the sector's growth. The department also aims to supply the labour market with competencies capable of creating new job opportunities outside the public sector, contributing to self-development and serving the community. It focuses on preparing graduates who are proficient in designing, implementing, and managing engineering projects according to the highest quality standards.

Mission Statement

Prepare technologically proficient engineers with the capability to employ modern techniques in designing, implementing, and maintaining diverse engineering projects. Also, equip them to manage and operate specialized production units for manufacturing construction materials and structural systems. Develop their ability to inspect various types of construction materials and structures. Foster a culture of continuous learning, self-improvement, and accessing reliable information sources. Additionally, cultivate and support creativity, innovation, and development among students and graduates, addressing the cultural requirements related to heritage and economic requirements. Facilitate employment opportunities for graduates, minimizing reliance on foreign competencies.

2. Program Specification

Programme code:	BCE	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

The department of Building and Construction Engineering Techniques is broad and essential, offering students a comprehensive education that emphasizes the entire construction process—from designing safe, efficient structures to managing complex projects and ensuring quality compliance. This program appeals to a range of interests: for some, it's the opportunity to work directly on essential infrastructure projects, while for others, it's a path to specialization in areas such as structural materials, project management, or sustainable construction methods. The curriculum is structured to build foundational knowledge at Level 1, where students gain a solid grounding in core engineering principles. At Level 2, students engage with program-specific topics, preparing them for advanced, research-informed modules at Levels 3 and 4. Graduates of this program are equipped to contribute to the labor market as skilled technical engineers, able to design, execute, and maintain various civil engineering projects.

At Levels 2, 3, and 4, students are encouraged to select modules that reflect the diversity and complexity of civil engineering projects—ranging from building design and material testing to project management and construction technology. This flexibility enables students to shape their education around their career interests, with guidance from personal tutors. Research and practical experience are integrated from the start, with hands-on labs, field courses, and research seminars that support the department's commitment to experiential learning. Level 1 includes essential workshops, while advanced levels offer opportunities for independent projects, whether field-based, laboratory-based, or analysis-driven, fostering critical thinking and problem-solving skills in line with the department's mission of producing competent, innovative engineers.

3. Program Objectives

1. Provide comprehensive academic programs leading to Bachelor's, Master's, and Ph.D. degrees in Building and Construction Techniques Engineering, focusing on developing engineering and technical skills to meet labour market demands.
2. Equip graduates with high-level competencies in designing, executing, and maintaining engineering projects, with the ability to integrate modern technologies and innovative solutions in the field of construction and building.
3. Advance scientific research in Building Technologies and Construction Materials Engineering, with a focus on applied research that addresses engineering challenges and contributes to technological advancements.
4. Offer engineering consultancy and technical services for various projects and enhance collaboration with governmental and private sectors to support sustainable infrastructure development.

5. Strengthen engagement with graduates to monitor their professional growth and utilize their expertise in updating curricula, ensuring alignment with modern advancements in the construction sector.
6. Contribute to community development by providing training courses and professional development programs for workers in the construction and building sector, aiming to enhance workforce efficiency and improve project quality

4. Student Learning Outcomes

The field of Building and Construction Techniques Engineering encompasses the study, design, execution, and maintenance of infrastructure projects, with a strong emphasis on structural systems, construction materials, and project management. Graduates of this program develop a comprehensive understanding of the technical, historical, and societal dimensions of construction engineering. They acquire the ability to apply core engineering principles to analyze and solve complex, real-world construction challenges. The Department offers a Bachelor of Science in Building and Construction Techniques Engineering, preparing students with practical competencies in construction management, materials testing, and structural analysis and design. Furthermore, the Department contributes to interdisciplinary education by offering service courses to students from other academic programs, thereby fostering broader professional development. The curriculum is strategically designed to support career readiness in the construction sector, postgraduate education, and advancement into specialized technical positions.

Outcome 1: Structural Analysis and Design
Graduates will be able to analyze and design structural components, understanding their function within larger engineering systems.

Outcome 2: Technical Communication
Graduates will be able to clearly communicate construction plans, project proposals, and technical findings through both oral and written formats.

Outcome 3: Practical Application of Construction Techniques
Graduates will be able to conduct on-site and laboratory testing of materials, operate specialized construction equipment, and adhere to safety standards.

Outcome 4: Historical and Social Context in Engineering
Graduates will be able to demonstrate an understanding of the development of construction technologies, including historical perspectives and societal impacts.

Outcome 5: Quantitative Analysis and Project Management
Graduates will be able to apply quantitative skills for project planning, resource management, and cost estimation in construction projects.

Outcome 6: Problem Solving and Innovation
Graduates will be able to use critical-thinking skills to identify challenges in construction projects and develop innovative solutions to address them.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

NTU University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

   CGPA of a 4-year B.Sc. degree:

   CGPA = [(1^{st} module score x ECTS) + (2^{nd} module score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BCE101	CONSTRUCTION MATERIALS	84	150	6.00	C	
BCE102	PLAIN SURVEYING	84	150	6.00	C	
BCE103	ENGINEERING MECHANICS (STATIC)	91	150	6.00	C	
BCE104	ENGINEERING DRAWING AND DESCRIPTIVE GEOMETRY	95	125	5.00	B	
BCE105	ENGINEERING PHYSICS	50	75	3.00	S	
NTU100	DEMOCRACY and HUMAN RIGHTS	35	50	2.00	S	
NTU101	ENGLISH LANGUAGE	35	50	2.00	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BCE106	BUILDING MATERIALS	84	150	6.00	C	
BCE107	SURVEYING-I	84	126	5.0	C	
BCE108	ENGINEERING GEOLOGY	54	75	3.00	B	
BCE109	ENGINEERING MECHANICS (DYNAMIC)	76	150	6.00	C	
BCE110	CALCULAS-1	74	150	5.00	B	
NTU102	COMPUTER	39	50	3.00	S	
NTU103	ABRABIC LANGUAGE	35	50	2.00	S	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BCE 201	CONCRETE TECHNOLOGY-I	84	125	5.00	C	
BCE 202	STRENGTH OF MATERIALS	66	125	5.00	C	
BCE 203	BUILDING CONSTRUCTION	54	100	4.00	S	
BCE 204	SURVEYING-II	84	125	5.00	C	
BCE 205	PROBABILITY & STATISTICS	54	100	3.00	C	
BCE 206	CALCULAS-II	106	125	4.00	B	
NTU200	CRIMES OF BAATH PARTY REGIME IN IRAQ	35	50	2.00	S	
NTU201	ENGLISH LANGUAGE	35	50	2.00	S	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BCE 209	CONCRETE TECHNOLOGY-II	84	150	6.00	C	
BCE 210	SOLID MECHANICS	73	150	6.00	C	
BCE 211	CONSTRUCTION TECHNIQUES	54	100	4.00	S	
BCE 212	FLUID MECHANICS	69	125	5.00	C	
BCE 213	MATHEMATICS	85	125	4.00	S	
NTU202	COMPUTER	39	50	3.00	S	
NTU203	ARABIC LANGUAGE	39	50	2.00	S	
BCE 214	PRACTICAL TRAINING-I					

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BCE 301	CONCRETE TECHNOLOGY-III	84	150	6.00	C	
BCE 302	FUNDAMENTALS OF REINFORCED CONCRETE	73	150	6.00	C	
BCE 303	STRACTURAL ANALYSIS	73	150	6.00	C	
BCE 304	SOIL MECHANICS	66	100	4.00	C	
BCE 305	PAVEMENT ENGINEERING	66	100	4.00	C	
BCE 306	ENGINEERING ANALYSIS	54	100	4.00	C	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BCE 307	MASONRY BUILDINGS	68	150	6.00	C	BCE 307
BCE 308	CONSTRUCTION MANAGEMENT	68	125	5.00	C	BCE 308
BCE 309	ADVANCED SOIL MECHANICS	66	100	4.00	C	BCE 309
BCE 310	ENVIRONMENTAL ENGINEERING	69	125	5.00	C	BCE 310
BCE 311	ADVANCED PAVEMENT ENGINEERING	53	125	5.00	C	BCE 311
BCE 312	NUMERICAL ANALYSIS	60	125	5.00	C	BCE 312

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BCE 401	DESIGN OF REINFORCED CONCRETE STRUCTURES	72	100	4.00	C	
BCE 402	TRANSPORTATION ENGINEERING	56	100	4.00	C	
BCE 403	QUANTITY SURVEYING & ESTIMATING	82	125	5.00	C	
BCE 404	FOUNDATION ENGINEERING	82	125	5.00	C	
BCE 405	CONSTRUCTION DRAWING	49	100	4.00	C	
BCE 406	DESIGN OF STEEL STRUCTURES	82	125	5.00	C	
BCE 407	INNOVATIVE PROJECT- I	30	75	3.00	C	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BCE 408	MATERIALS FOR HERITAGE buildings	52	125	5.00	C	
BCE 409	ADVANCED FOUNDATION ENGINEERING	82	125	5.00	C	
BCE 410	SAFETY IN CONSTRUCTION	35	50	2.00	B	
BCE 411	COMPUTER AIDED DESIGN OF STRUCTURE	79	125	5.00	C	
BCE 412	REPAIRS & REHABILITATION OF STRUCTURES	53	125	5.00	C	
BEC 413	SUSTAINABLE CONSTRUCTION MATERIALS	53	125	5.00	C	
BEC 414	INNOVATIVE PROJECT-II	30	75	3.00	C	

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