Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description

Northern Technical University

Technical Engineering College/Mosul

Building and Construction Techniques Engineering

Bachelor's degree in building & construction Techniques Engineering.

Final Certificate Name: Bachelor's degree in building & construction Techniques Engineering.

Academic System: Credit hours

Description Preparation Date: 1/7/2025

File Completion Date: 1/7/2025

Signature:

Head of Department Name:

Dr. Zaid Hazim Hussein

Date:2/9/2024

Signature:

Scientific Associate Name:

Assist. Prof. Dr Mohammed Sabah Jarjees

Date: 2/9/2024

The file is checked by:

Department of Quality Assurance and University Performance

Assist. Lecturer Warqaa Hashim Mahmood

Date:

Signature:

Approval of the Dean

1.Program Vision

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.

2.Program Mission

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.

3.Program Objectives

The Building and Construction Techniques Engineering department aims to:

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.Program Accreditation

The program has applied for program accreditation from the National Council for Program Accreditation of Technical Engineering Education, which operates under the Scientific Supervision and Evaluation Apparatus.

5.Other external influences

Not Available

6.Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	2	4	10%	basic
College Requirements	3	4	10%	Optional
Department Requirements	12	28	70%	basic
Summer Training	–	–	–	basic
Other (Optional)	2	4	10%	

* This can include notes whether the course is basic or optional.

7.Program Description

Year/Level	Course	Course Name	Credit Hours

	Code		Theoretical	Practical
Level Four	NTU 400	English Language 4	2	–
Level Four	NTU 401	Research Methodology	2	–
Level Four	TEMO 400	Engineering Management	2	–
Level Four	TEMO 401	Graduation Project 1	–	3
Level Four	TEMO 402	Graduation Project 2	–	3
Level Four	BCE 400	Analysis and Design of Concrete Structures	2	3
Level Four	BCE 401	Estimation and Specifications	3	1
Level Four	BCE 402	Sanitary Engineering	2	2
Level Four	BCE 403	Foundation Engineering	3	1
Level Four	BCE 404	Design of Steel Structures	3	1
Level Four	BCE 405	Advance Analysis and Design of Concrete Structures	2	3
Level Four	BCE 406	Advance Foundation Engineering	3	1
Level Four	BCE 407	Advance Design of Steel Structures	3	1
Level Four	BCE 408	Constructional Drawing	–	3
Level Four	BCE 409	Economic Engineering	2	2
Level Four	BCE 410	Hydrology	2	–
Level Four	BCE 411	Computer applications 3	1	3

8.Expected learning outcomes of the program

Knowledge	
A1: Specialized Engineering Knowledge	Demonstrate comprehensive understanding of structural, geotechnical, transportation, and environmental engineering relevant to building and construction technologies.
A2: Construction Materials and Technologies	Identify and assess traditional and advanced construction materials in terms of properties, applications, durability, sustainability, and environmental impact.
A3: Engineering Codes and Standards	Understand and apply national and international engineering regulations, codes, and standards in design and execution of construction projects.
A4: Construction Technology and Innovation	Demonstrate awareness of modern construction technologies including prefabrication, smart materials, and digital engineering tools.
Skills	
B1: Site Investigation, Surveying and Testing	Conduct laboratory and field tests (destructive and non-destructive) on materials and soils; analyze results for compliance and structural integrity. Use modern surveying equipment and software for land measurement, leveling, layout, and infrastructure design

B2: Technical Drawing and Structural analysis	Prepare and interpret structural and architectural drawings using CAD tools; generate quantity takeoffs, cost estimates, and technical reports. Utilize engineering software to analyze and evaluate structural systems in terms of strength, stability, and safety
B3: Project Planning, Management, and Site Management	Apply project scheduling and resource management techniques for efficient execution of engineering projects. Manage construction site activities, including equipment logistics, quality control, and adherence to health and safety protocols
B4: Documentation and Safety management	Compile technical documentation and reports in line with engineering standards. Implement and monitor health and safety protocols on-site to ensure compliance with regulatory frameworks
Ethics	
C1: Professional Ethics	Practice engineering with integrity, accountability, and fairness, adhering to ethical standards and societal responsibility.
C2: Environmental Responsibility	Integrate sustainability principles and eco-friendly practices throughout project planning, design, and execution.
C3: Lifelong Learning:	Commit to continuous personal and professional development by staying current with advancements in construction engineering.
C4: Leadership and Teamwork	Demonstrate effective leadership, collaboration, and communication skills within multidisciplinary project teams.

9. Teaching and Learning Strategies

The teaching and learning strategies for the program are designed to ensure active engagement and skill acquisition through a variety of methods. These include:

1. Interactive lectures and problem-based learning (PBL)
2. Laboratory and field work
3. Design projects and case studies
4. Summer training
5. Group discussions and seminars
6. Use of simulation and engineering software tools
7. Capstone project for integrative learning

10. Evaluation methods

Evaluation is conducted continuously and systematically across the program stages using a combination of methods such as:

1. Written exams (midterm and final)
2. Quizzes and assignments
3. Laboratory and practical reports
4. Project presentations and technical documentation
5. Oral examinations and peer assessment
6. Evaluation of internship performance
7. Capstone project defence and rubric-based assessment

11. Faculty

Faculty Members						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Civil	Construction materials			1	
Assist Professor	Civil	Construction materials, Structure, Environment, Soil Mechanics			5	
Lecturer	Civil	Construction materials, Structure, Environment, Water resources, architecture			12	1
Assist Lecturer	Civil/Water Resources	Construction materials, Water resources, Building materials, Soil mechanics, architecture			12	5

12. Professional Development

Mentoring new faculty members

The institution adopts a structured and systematic mentoring process to support new, visiting, full-time, and part-time faculty members in their transition into the academic environment. The process is designed to foster professional integration, pedagogical competence, and alignment with institutional values and quality standards. The mentoring program includes the following components:

Orientation and Induction Program: All new faculty members attend a mandatory orientation at the beginning of their appointment. This includes an introduction to the institution's mission, academic policies, curriculum framework, teaching and learning strategies, research expectations, and administrative procedures.

Teaching Support and Peer Observation: New faculty are encouraged to participate in peer observation cycles, where they attend and are observed during classroom sessions. Constructive feedback is provided to help them improve their teaching practices. Participation in workshops on instructional design, outcome-based education (OBE), and technology-enhanced learning is also supported.

Regular Review Meetings: Monthly review sessions are held between the Head of department and the new faculty to track progress, discuss challenges, and ensure integration into academic and research activities. These meetings are documented and reported to the scientific committee to monitor mentoring effectiveness.

Professional Development Plan: Each new faculty member develops an individualized professional development plan. This plan outlines short-term and long-term goals for teaching, research, and service.

Professional development of faculty members

The institution implements a continuous professional development plan that includes training in modern

teaching and learning strategies, assessment of learning outcomes, use of digital tools and simulation software, and participation in national and international conferences. Faculty are also encouraged to engage in research and community service to enhance their academic profiles.

13. Acceptance Criterion

Admission to the Building and Construction Techniques Engineering program is primarily granted through centralized admission for graduates of the scientific branch of secondary education, in accordance with the annual requirements and minimum grade thresholds set by the Ministry of Higher Education. Additionally, a limited percentage of top-ranking graduates from technical institutes, as well as a defined percentage of graduates from the industrial branch of vocational secondary schools, may be accepted through direct admission as determined by the Ministry. These candidates must fulfill the academic and administrative requirements stipulated by the institution and relevant regulatory authorities.

14. The most important sources of information about the program

1. The college's official website
2. Program handbook and curriculum guide
3. Academic advisors and department office
4. Ministry of Higher Education portal
5. Orientation sessions and brochures

15. Program Development Plan

The program is reviewed periodically through feedback gathered from key stakeholders, including faculty members, students, alumni, and industry partners. The review process incorporates benchmarking with national and international engineering programs, analysis of graduate performance and employability, as well as continuous updates based on technological advancements. In line with this process, the department is also committed to the development of educational laboratories and field training facilities, aiming to enhance the practical and applied aspects of the curriculum and ensure a modern learning environment that aligns with contemporary engineering education standards.

All such initiatives and activities are documented in the department's strategic plan, which was formally approved by the Department Council and the College Deanery at the beginning of the current academic year, reflecting the department's commitment to academic quality and sustainable development.

Program Skills Outline																
				Required program Learning outcomes												
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
Level Four	NTU 400	English Language 4									√				√	
Level Four	NTU 401	Research Methodology									√				√	
Level Four	TEMO 401	Graduation Project 1		√					√						√	
Level Four	TEMO 402	Graduation Project 2		√					√						√	
Level Four	BCE 400	Analysis and Design of Concrete Structures		√					√			√				
Level Four	BCE 401	Estimation and Specifications		√					√					√		
Level Four	BCE 402	Sanitary Engineering		√					√				√			
Level Four	BCE 403	Foundation Engineering		√					√					√		
Level Four	BCE 404	Design of Steel Structures		√					√			√				
Level Four	BCE 405	Advance Analysis and Design of Concrete Structures		√					√			√				

Level Four	**BCE 406**	**Advance Foundation Engineering**		√					√					√	
Level Four	**BCE 407**	**Advance Design of Steel Structures**		√					√			√			
Level Four	**BCE 408**	**Constructional Drawing**		√					√			√			
Level Four	**BCE 409**	**Economic Engineering**		√					√					√	
Level Four	**BCE 410**	**Hydrology**		√					√					√	
Level Four	**BCE 411**	**Computer applications 3**		√					√			√			

English language 4

1.Course Name:	
English language 4	
2.Course Code:	
NTU 400	
3.Semester / Year:	
First semester - Fourth year	
4.Description Preparation Date:	
1 / 9 / 2024	
5.Available Attendance Forms:	
In-person - mandatory	
6.Number of Credit Hours (Total) / Number of Units (Total)	
2 hours / 2 units	
7.Course administrator's name (mention all, if more than one name)	
Name: Zaid Hazim Al-Saffar **Email: zaid.alsaffar@ntu.edu.iq**	
8.Course Objectives	
Course Objectives	**1- Developing basic English language skills:** The course aims to develop students' skills in the four aspects of the English language: reading, listening, speaking, and writing, in an integrated manner. **2- Supporting the student's academic specialization:** Through mastering the English language, students are expected to acquire language proficiency that aligns with their university majors in the fields of science, technology, culture, and the arts. **3- Enhancing motivation to learn the language:** The course encourages students to develop their English language skills through activities and content that motivate them to participate and engage effectively**.** **4- Expanding general knowledge:** The course seeks to expand students' horizons not only linguistically, but also cognitively, through diverse educational topics such as government, economics, technology, and health. **5- Developing character and building values:** The course is part of the character development curriculum, contributing to enhancing communication skills, appreciating different cultures, and developing critical thinking among students

9.Teaching and Learning Strategies	
Strategy	**1- Interactive Learning**: This strategy relies on engaging students in activities such as pair work, small group work, and role-playing. The goal is to break down barriers and build confidence in using the language. Students are asked to introduce themselves, conduct interviews, or exchange information. **2- Integrated Skills Approach**: This approach combines reading, listening, speaking, and writing skills within a single learning unit. This integration helps students use the language more comprehensively and naturally, as it occurs in real life. **3- Contextualized Learning**: Activities are based on real-life situations from university students, such as "daily routine," "education," "health," and "jobs." Linking language to everyday contexts contributes to making the learning process more effective. **4- Task-Based Learning:** This involves engaging in goal-oriented activities such as arranging sentences to form a paragraph, writing formal letters, or simulating a job interview. **5- Developing Critical Thinking and Expressing Opinions**: This course asks students to express their opinions on social and educational issues (e.g., "Is free education possible?") and justify their positions using English. "Agree, Somewhat, Agree, disagree" activities are also used to support dialogue and discussion skills, developing analytical thinking alongside language skills.

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
FIRST	2	- Introducing yourself and others using simple sentences - Understanding the use of possessive pronouns and possessive adjectives	Unit one Introduction of English	Interactive lecture + Presentation	Class participation + homework
Second	2	Forming questions using interrogative words (W h-questions)	Unit one (W h-questions)	Interactive lecture + group discussion	Class participation + homework
Third	2	Describe daily routine using the simple present tense.	Unit two Daily Routines	Interactive lecture + brainstorming	Class participation + individual exercise
Fourth	2	Using Adverbs of Frequency (always, sometimes, never).	Unit two Daily Routines	Interactive Lecture + Educational Video	Class Participation
Fifth	2	Measuring Student Comprehension of Basic Concepts (1-4)	Daily Test	Interactive Review + Paper Test	Paper Test
Sixth	2	Identify different professions	unit three	Interactive	Open discussion

		and describe their duties.	Professions	lecture	+ real-life examples and practical exercises
Seventh	2	Use possessive forms ('s) and possessive pronouns. Write a paragraph about the family's profession.	unit three Professions	Interactive Lecture Group Activity: Professional Interview	Oral Test
Eighth	2	Discussing educational issues using modal verbs (Could).	Unit four Education	Interactive lecture + case study	Homework
Ninth	2	Expressing agreement and disagreement. Write a paragraph about an educational experience.	Unit four Education	Interactive Lecture	Class Participation
Tenth	2	Comprehensive assessment of student understanding of topics from Weeks 1 to 9	Semester Exam	Interactive Lecture	Paper-based Test
Eleventh	2	Using the Future Tense (will/be going to)	Unit Five Government	Interactive Lecture	Class Participation
Twelfth	2	Write a paragraph about your opinion on a public opinion issue.	Unit Five Government	Interactive lecture	Class participation + paper-based test
Thirteenth	2	Depends on the type of noun (numerical/nonnumerical) and context (positive, negative, interrogative).	Unit Six Noun Un & Noun Quantifiers	Interactive Lecture + Ope ended Questio	Class Participation + Paper-Based Test
Fourteenth	2	Comprehensive assessment of student understanding of topics from weeks 1 to 14	Comprehensive review	Interactive lecture	Class participation
Fifteenth	2	The student will summarize the course's key concepts and answer comprehensive questions.	Final Exam	Group Review Open-Ended Questions	Final Exam

11.Course Evaluation

1- Yearly work (10) including: (paper test + attendance + daily participation + classwork)
2- Semester exam (30)
3- Annual effort (10 + 30) = 40
4- Final exam (60)
6- Final grade (annual effort out of 40 + final exam out of 60) = 100

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures prepared by the instructor according to the prescribed educational package
Main references (sources)	English for University Students: A Handbook of Activities & Classroom Teaching (Revised Edition)
Recommended books and references (scientific journals, reports...)	"Academic Writing: A Handbook for International Students" – Stephen Bailey
Electronic References, Websites	https://www.oxfordonlineenglish.com/freeenglish-grammar-lessons

Research Methodology

1.Course Name:	
Research Methodology	
2.Course Code:	
NTU 401	
3.Semester / Year:	
2024 - 2025	
4.Description Preparation Date:	
7 / 6 / 2025	
5.Available Attendance Forms:	
In-person (Compulsory)	
6.Number of Credit Hours (Total) / Number of Units (Total)	
30 hr / Number of units (2 hr/ weekly)	
7.Course administrator's name (mention all, if more than one name)	
Name: Dr Mohammed Hatim Mohammed **Email: mohammed.hatem@ntu.edu.iq**	
8.Course Objectives	
Course Objectives	The course aims to provide the student with a set of fundamental knowledge and skills that qualify them to become a researcher capable of producing scientific knowledge in a systematic and objective manner. The course aims to build the student's cognitive and skill base to become a researcher capable of generating scientific knowledge, analyzing problems, thinking critically, adhering to research ethics, and contributing to the development of society through systematic scientific research.
9.Teaching and Learning Strategies	
Strategy	Assigning students to prepare an applied research project during the semester enhances their practical understanding of research methodology and helps bridge the gap between theory and practice. Students are divided into small groups to work on specific components of a research project (such as the research problem, hypotheses, and data collection tools), which fosters teamwork and critical thinking skills. A theoretical presentation of the content is delivered while incorporating open-ended questions, short discussions, and brainstorming sessions to maintain student focus and encourage participation. Analyzing real research studies from various fields helps students understand how to apply the steps of research in real-life contexts.

	Course Outcomes and Methods of Teaching, Learning, and Assessment **Course Outcomes:** 1.Understand the fundamentals, principles, types, and importance of scientific research. 2.Acquire skills to identify the research problem, formulate hypotheses, and select appropriate data collection tools. 3.Ability to analyze information, evaluate it, and predict outcomes. 4.Apply the steps of scientific research and write a report or scientific paper following the correct methodology. 5.Distinguish between different research methodologies and choose the most suitable one according to the topic. 6.Adhere to research ethics and teamwork. **How they are determined:** Determining course outcomes is a systematic process that starts from the academic program's objectives and ends with formulating clear and measurable learning outcomes for the course itself. This process begins by reviewing the academic program's goals and mission. The working team reviews the program's objectives and mission, along with the university's vision and general goals, to ensure that the course outcomes contribute to achieving these higher objectives.

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The concept of scientific research and its importance	Introduction to scientific research: concept and objectives	Theoretical lecture, discussion	Quiz, class participation
2	2	Distinguish different types of scientific research	Types of scientific research (descriptive, experimental, etc.)	Lecture, Practical Examples	Assignments, short questions
3	2	Identify the research problem and formulate hypotheses	Identify the research problem and formulate hypotheses	Workshop, Practical Training	Submit a research problem
4	2	Learn about data sources and collection tools	Data collection tools (questionnaire, interview, note)	Lecture, practical training	Evaluation of data collection tools
5	2	Understanding research design	Research design: planning and implementation steps	Lecture, Case Study	Mid-term exam
6	2	Apply data collection methods	Practical application to data collection	Field training, teamwork	Practical Reports
7	2	Quantitative and qualitative data analysis	Methods of statistical analysis and qualitative analysis	Lecture, the use of analysis software	Applied Test
8	2	Writing scientific research according to	Research Writing: Structure and Content	Writing workshop,	Submit a research draft

		scientific methodology		model review	
9	2	Documentation of sources and ethics of scientific research	Documentation and Research Ethics	Lecture, Discussion	Documentation Evaluation
10	2	Teamwork in scientific research	Work in a research team	Practical training, group activities	Teamwork Evaluation
11	2	The use of technology in scientific research	Use of software and electronic resources	Lecture, practical application	Applied Project
12	2	View and discuss research results	Presentation and discussion skills	Hands-on training, presentations	Evaluation of offers
13	2	Review and evaluation of scientific research	Criticism and analysis of previous research	Discussion, Case Study Analysis	Critical Report
14	2	Preparing an integrated research plan	Preparing an integrated research plan	Workshop, individual mentorship	Submit a research plan
15	2	Comprehensive assessment of scientific research skills	General review and final evaluation	Final Exam, Project Submission	No distribution added

11.Course Evaluation

The grading is out of 100, distributed according to the tasks assigned to the student, such as: daily preparation (5 marks), homework (5 marks), daily quizzes (5 marks), monthly exams (10 marks), reports and presentations (15 marks), and the final exam (60 marks).

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	منهجية البحث العلمي خطواته ومراحله أساليبه ومناهجه أدواته ووسائله أصول كتابته
Main references (sources)	How to write and publish scientific paper
Recommended books and references (scientific journals, reports...)	How to write and publish scientific paper, google scholar, Resegregate
Electronic References, Websites	https://faculty.uobasrah.edu.iq/uploads/teaching/1669435520.pdf

Engineering Management

1. Course Name:
Engineering Management
2. Course Code:
TEMO 400
3. Semester / Year:
2024/2025
4. Description Preparation Date:
1/9/2024
5. Available Attendance Forms:
In-person (Compulsory)
6. Number of Credit Hours (Total) / Number of Units (Total) :
2/2
7. Course administrator's name (mention all, if more than one name)
Name: Enas Hisham Mohammed Email: enas.alhayali@ntu.edu.iq
8. Course Objectives

Course Objectives	1-Project Delivery On-Time Completion: Ensuring the project is completed within the agreed-upon timeframe. 2- Risk Mitigation Identifying and Addressing Risks: Proactively identify potential risks and implement strategies to mitigate or avoid them. 3- Stakeholder Satisfaction Meeting Expectations: Ensuring that the project meets or exceeds the expectations of all stakeholders, including the owner, contractors, subcontractors, and regulatory bodies.

9. Teaching and Learning Strategies	
Strategy	• **Lectures:** Providing comprehensive explanations of concepts, theories, and principles. • **Discussions:** Facilitating interactive discussions to explore different perspective and encourage critical thinking. • **Case Studies:** Analyzing real-world construction projects to apply theoretical knowledge and develop problem-solving skills.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1week	2	Presentation, Lecture, explanation, FAQ, discussion.	Construction management as a discipline	Lecture	Short Exam
2 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Characteristics of the construction industry	Lecture	Short Exam
3 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Domestic and global construction market	Lecture	Short Exam
4 weeks	2	Presentation, Lecture, explanation, FAQ,	Use correctly the definition of a project.	Lecture	Short Exam

		discussion.			
5 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Principles of project management	Lecture	Short Exam
6 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Project management function correctly	Lecture	Short Exam
7 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Implement planning and design	Lecture	Short Exam
8 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Project scope management critical Path method.	Lecture	Short Exam
9 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Project scope management critical Path method.	Lecture	Short Exam
10 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Nature of construction Projects.	Lecture	Mid- term
11 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Project life- cycle.	Lecture	Short Exam
12 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Project management functions	Lecture	Short Exam
13 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Elements of cost	Lecture	Short Exam
14 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Critical path method	Lecture	Short Exam
15 weeks	2	Presentation, Lecture, explanation, FAQ, discussion.	Critical path method	Lecture	Short Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Management Science Applications in Project by Dr. Steven A. Gabriel
Main references (sources)	From Concept to Completion Total Project Management by Stallworthy, E.A. and O.P. Kharbanda
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Analysis and Design of Reinforced Concrete Structures

1.Course Name:	
Analysis and Design of Reinforced Concrete Structures	
2.Course Code:	
BCE400	
3.Semester / Year:	
First / 4th	
4.Description Preparation Date:	
1/9/2024	
5.Available Attendance Forms:	
Compulsory	
6.Number of Credit Hours (Total) / Number of Units (Total)	
5/3	
7.Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof. Dr. Hasan Mohammed Ahmed Albegmprli Email: albegmprli@ntu.edu.iq	
8.Course Objectives	
Course Objectives	1. To enable students to understand and apply the principles of concrete and steel reinforcement design effectively. 2. To provide the foundational skills needed for integration into the construction and engineering job market. 3. To support the development of both theoretical understanding and practical application skills in structural engineering. 4. To encourage lifelong learning through participation in specialized professional training courses. 5. To prepare motivated students for academic and research careers by enabling them to pursue postgraduate studies in structural engineering.
9.Teaching and Learning Strategies	
Strategy	**1. Lectures** - Used to introduce theoretical concepts and design principles. - Supported by visual aids (slides, diagrams, videos). **2. Problem-Solving Sessions** - Guided practice on analysis and design problems using manual methods. - Emphasis on understanding code-based procedures and structural behaviour. **3. Case Studies** - Analysis of real-life structural failures and successful designs. - Helps bridge theory and practice and develop critical thinking. **4. Software Training** - Introduction to structural design software (e.g., SAP2000,

	ETABS, SAFE). - Allows students to simulate, analyse, and verify design outputs. **5. Group Discussions and Peer Learning** - Promotes exchange of ideas and collaborative problem-solving. - Useful for reinforcing complex topics through peer explanation. **6. Assignments and Homework** - Regular individual tasks to reinforce classroom instruction. - Focus on both conceptual and numerical problem-solving. **7. Field Visits** - Visits to construction sites or design offices to observe real-life applications. - Enhances practical understanding and professional awareness.

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Define the slender column Concentrically loaded columns	Slender columr	Presentation, explanation, questions and answers, discussion	Quiz HW
2	5	Compression plus bending	Slender columr	Presentation, explanation, questions and answers, discussion	Quiz HW
3	5	ACI criteria for non-sway frames versus sway frames	Slender columr	Presentation, explanation, questions and answers, discussion	Quiz HW
4	5	ACI moment magnifier method for non-sway frames	Slender columr	Presentation, explanation, questions and answers, discussion	Quiz HW
5	5	Knowledge of the types of slabs	Floor systems	Presentation, explanation, questions and answers, discussion	Quiz HW
6	5	Design of one-way slabs,	One-way slabs	Presentation, explanation, questions and answers, discussion	Quiz HW
7	5	Behavior of two-way edge supported slabs.	two-way edge supported slab	Presentation, explanation, questions and answers, discussion	Quiz HW
8	5	Direct design method for column supported slabs, depth limitation of the ACI code	two-way edge supported slab	Presentation, explanation, questions and answers, discussion	Quiz HW
9	5	Equivalent frame method		Presentation, explanation, questions and	Quiz HW

				answers, discussion	
10	Mid Exam				
11	5	Behavior of two-way edge supported slabs.	Flat slab	Presentation, explanation, questions and answers, discussion	Quiz HW
12	5	Direct design method for column supported slabs, depth limitation of the ACI code	Flat slab	Presentation, explanation, questions and answers, discussion	Quiz HW
13	5	Equivalent frame method	Flat slab	Presentation, explanation, questions and answers, discussion	Quiz HW
14	5	Behavior of column supported slabs,	Flat slab	Presentation, explanation, questions and answers, discussion	Quiz HW
15	5	Direct design method for column supported slabs, depth limitation of the ACI code	Project discussion	Presentation, explanation, questions and answers, discussion	Quiz HW

11.Course Evaluation

Continuous curriculum updates to keep pace with labor market developments, such as:

1. Keeping up with updates in engineering codes.
2. Enhancing practical and applied skills through the use of modern software.
3. Meeting the requirements of academic accreditation.
4. Developing learning outcomes to align with program outcomes and labor market needs.

12.Learning and Teaching Resources

Required textbooks	
Main references	Design of Concrete Structures –Nilson, Darwin, Dolan14thEd
Recommended books and references	• Structural Concrete-Theory and Design – Hassoun, Al-Manaseer 4thEd • ACI 318-14
Electronic References, Websites	https://www.youtube.com/@MrElgamal77

Estimation and Specifications

1.Course Name:
Estimation and Specifications
2. Course Code:
BCE 401
3.Semester / Year:
First / Fourth
4.Description Preparation Date:
1/9/2024
5.Available Attendance Forms:
In-person (Compulsory)
6.Number of Credit Hours (Total) / Number of Units (Total)
3 hours / 4 units
7.Course administrator's name (mention all, if more than one name)
Name: Waseem T. Mohammed Email: Waseem.thabit@ntu.edu.iq
8.Course Objectives

Course Objectives	Enable students to make approximate and detailed estimates buildings. Enable students to make rate analysis. Enable students to specify the proper method of measurement.
9.Teaching and Learning Strategies	
Strategy	1. Demonstrate each method with step-by-step examples. 2. Use guided worksheets and templates for repetition and practice. 3. Familiarize students with industry tools like Primavera P6. 4. Familiarize students with tools such as Excel for spreadsheets. 5. Assign group projects with defined roles. 6. Arrange construction site visits to connect classroom estimation with real conditions.

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Demonstrate an understanding of the fundamental concepts of estimation, including its definition,	Introduction: engineering projects &estimation, definition of estimation, benefits of estimation	Direct Instruction involves explaining the concept in a step-by-step manner.	Quiz and comprehensive exam

		benefits, and types.			
2	4	Demonstrate an understanding of the fundamental concepts of estimation, including its definition, benefits, and types.	Factors affecting cost estimation, types of estimation, and practical examples on approximate estimation.	Direct Instruction involves explaining the concept in a step-by-step manner.	
3	4	Apply general rules for quantitative surveys and select appropriate measurement units for various construction items.	General rules in quantitative survey: Principles in selecting units of measurement for items, various units and modes of measurement for different items of work, details of quantities measured.	Direct Instruction involves explaining the concept in a step-by-step manner.	Homework and a comprehensive exam
4	4	Apply general rules for quantitative surveys and select appropriate measurement units for various construction items.	Rate analysis, factors affecting the cost of materials and labour, Plants and equipment - hour costs based on total costs and Outputs, Overhead charges, rates for various items of construction of civil engineering works, problems and examples on rate analysis.	Direct Instruction involves explaining the concept in a step-by-step manner.	Classwork and a comprehensive exam
5	4	Analyze rates for construction work and understand the cost variables related to materials, labor, and equipment.	Methods of working quantities for various items of works, Measurement and abstract sheets and recording, excavation and fill works for wall footings.	Direct Instruction involves explaining the concept in a step-by-step manner.	Quiz and comprehensive exam
6	4	Analyze rates for construction work and understand the cost variables related to materials, labor, and equipment.	Estimation of walls and other items of buildings up to D. P. C. level, methods used to calculate the length of various works: the method of strips and the center lines method, examples and problems.	Direct Instruction involves explaining the concept in a step-by-step manner.	Quiz and comprehensive exam
7	4	Perform accurate measurements and record data for construction works, including earthworks and masonry.	Earthworks for various engineering projects: irrigation channels, roadway embankments, and methods used for calculating earthwork quantities and volumes.	Direct Instruction involves explaining the concept in a step-by-step manner.	Homework and a comprehensive exam
8	4	Estimate	Mass diagrams,	Direct	Classwork and a

		quantities for different construction materials and processes, including concrete and finishing works.	calculations of excavation volumes due to cut works (grid leveling method and triangular method), examples, and problems.	Instruction involves explaining the concept in a step-by-step manner.	comprehensive exam
9	4	Estimate quantities for different construction materials and processes, including concrete and finishing works.	Estimation of masonry works, basic units and materials used, Estimation of wall construction, damp proofing used, brick works, block works, stone works, examples and problems.	Direct Instruction involves explaining the concept in a step-by-step manner.	Quiz and comprehensive exam
10	4	Understand technical specifications and their role in ensuring project quality and cost estimation.	Estimation of concrete works, primary materials used, mixing of concrete materials, types of concrete mixers, calculating quantities of concrete materials, examples, and problems	Direct Instruction involves explaining the concept in a step-by-step manner.	Quiz and comprehensive exam
11	4	Understand technical specifications and their role in ensuring project quality and cost estimation.	Estimation of concrete works quantities for spread and combined footings.	Direct Instruction involves explaining the concept in a step-by-step manner.	Homework and a comprehensive exam
12	4	Utilize computer-aided estimation tools effectively for construction project analysis.	Estimation of concrete works quantities for lintels, beams, roofs, columns and stairs and estimation of form works quantities for lintels, beams, roofs, tie beams, columns, and arches.	Direct Instruction involves explaining the concept in a step-by-step manner.	Classwork and a comprehensive exam
13	4	Utilize computer-aided estimation tools effectively for construction project analysis.	Reinforcement calculations for beams, roofs, columns and footings, specifications	Direct Instruction involves explaining the concept in a step-by-step manner.	Quiz and comprehensive exam
14	4	Apply valuation principles to determine property values and understand factors influencing valuations.	Finishing works: types, estimation of outside and inside finishing works, plastering, painting, brick and stone coating, glass works, specifications	Direct Instruction involves explaining the concept in a step-by-step manner.	Quiz and comprehensive exam
15	4	Apply valuation principles to determine property values and understand	Estimation of tiles works: tiles, mosaic, ceramic, porcelain, sanitary, sewage, plumbing and electrical	Direct Instruction involves explaining the concept in a step-	Quiz and comprehensive exam

		factors influencing valuations.	works.	by-step manner.	

11.Course Evaluation	
10% on H.W, 10% on C.W, 10% on Quizzes, 20% on Mid-term exam, 50% on Final exam	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	N/A
Main references (sources)	"Project Estimating and Cost Management" by Parviz F. Rad "Cost Estimation: Methods and Tools" by Gregory K. M. L.
Recommended books and references (scientific journals, reports...)	"Fundamentals of Estimating" by Stephen L. Cole
Electronic References, Websites	https://www.engineeringestimatingtools.com/ https://www.aacei.org/

Sanitary Engineering

1.Course Name:	
Sanitary Engineering	
2.Course Code:	
BCE402	
3.Semester / Year:	
first Semester/ third	
4.Description Preparation Date:	
1/9/2024	
5.Available Attendance Forms:	
In-person (On-campus) Attendance	
6.Number of Credit Hours (Total) / Number of Units (Total)	
4 Hours/3 Units	
7.Course administrator's name (mention all, if more than one name)	
Name: Nabel Kalel Asmel Email: nabeelismail@ntu.edu.iq	
8.Course Objectives	
Course Objectives	1. To provide an in-depth understanding of the principles and practices of sanitary engineering**,** including the design, operation, and maintenance of water supply, wastewater collection, treatment, and disposal systems. 2. To develop the ability to apply scientific and engineering principles for solving complex problems related to public health, environmental protection, and sustainable urban sanitation. 3. To equip students with the skills necessary to design and evaluate sanitary infrastructure, such as sewerage networks, wastewater treatment plants, and solid waste management systems, in compliance with national and international standards. 4. To foster critical thinking and analytical capabilities for assessing the environmental and societal impacts of sanitation projects, including risk assessment and mitigation strategies. 5. To promote the integration of modern technologies and innovative solutions in sanitary engineering practices to address emerging challenges in urbanization, climate change, and resource management. 6. To enhance competencies in interdisciplinary collaboration, communication, and ethical decision-making**,** essential for professional practice in the field of sanitary and environmental engineering.
9.Teaching and Learning Strategies	
Strategy	The teaching and learning strategies employed in sanitary engineering are designed to foster deep understanding, critical thinking, and practical competence in addressing complex environmental and public health challenges. These strategies integrate theoretical foundations with applied engineering practices, and include: 1. **Lectures and Interactive Seminars** 2. **Laboratory and Field Work** 3. **Design Studios and Project-Based Learning** 4. **Case Study Analysis** 5. **Simulation and Modelling Exercises** 6. **Blended and E-learning Approaches** 7. **Interdisciplinary and Community-Based Learning**

	8. **Assessment and Feedback Loops**

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understand the scope and significance of sanitary engineering in public health.	Introduction to Sanitary Engineering	Lecture, Discussion	Quiz
2	4	Describe water supply systems and their components.	Water Supply Engineering	Lecture, Case Study	Written Assignment
3	4	Analyze sources and characteristics of drinking water.	Water Sources and Quality	Lecture, Lab Demonstration	Lab Report
4	4	Apply principles of water treatment processes.	Water Treatment Technologies	Lecture, Simulation	Test
5	4	Design basic water distribution networks.	Water Distribution Systems	Lecture, Design Studio	Design Exercise
6	4	Identify wastewater sources and characteristics.	Wastewater Engineering	Lecture, Discussion	Quiz
7	4	Explain wastewater collection system design.	Sewerage Systems	Lecture, Field Visit	Field Report
8	4	Evaluate wastewater treatment processes	Wastewater Treatment Plants	Lecture, Lab Work	Lab Report
9	4	Discuss sludge treatment and disposal methods.	Sludge Management	Lecture, Case Study	Assignment
10	4	Assess stormwater management systems	Stormwater Drainage	Lecture, Design Studio	Design Submission
11	4	Explain solid waste collection and disposal strategies	*Sustainable Sanitary Engineering*	Lecture, Discussion	Written Test
12	4	Analyze environmental impact of sanitary engineering systems	Environmental Impact Assessment	Lecture, Workshop	Report
13	4	Integrate health, safety, and sustainability principles in design.	Sustainable Sanitary Engineering	Lecture, Discussion	Written Test
14	4	Apply computational tools in sanitary engineering design.	Sanitary Engineering Modelling	Computer Lab, Simulation	Project Submission
15	4	Synthesize knowledge through case study analysis and project work	Integrated Sanitary Systems Design	Group Project, Seminar	Final Project Presentation

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Metcalf & Eddy, Inc. (2014). *Wastewater Engineer Treatment and Resource Recovery* (5th ed.). McGraw-Education. Hammer, M. J., & Hammer Jr., M. J. (2012). *Water Wastewater Technology* (7th ed.). Pearson Education.
Main references (sources)	chobanoglous, G., & Kreith, F. (2002). *Handbook of Solid Waste Management* (2nd ed.). McGraw-Hill. Davis, M. L., & Masten, S. J. (2019). *Principles of Environmental Engineering and Science* (4th ed.). McGraw-Hill Education.
Recommended books and references (scientific journals, reports...)	Mara, D. (2004). *Domestic Wastewater Treatment in Developing Countries.* Earthscan. *Journal of Environmental Engineering*, American Society

	of Civil Engineers (ASCE). *Water Research*, Elsevier. World Health Organization (WHO) technical reports on water, sanitation, and hygiene.
Electronic References, Websites	U.S. Environmental Protection Agency (EPA) – https://www.epa.gov World Health Organization (WHO) – Water, Sanitation & Hygiene – https://www.who.int/water_sanitation_health International Water Association (IWA) – https://iwa-network.org OpenCourseWare, MIT – Sanitary and Environmental Engineering resources – https://ocw.mit.edu

FOUNDATION ENGINEERING

1.Course Name:
FOUNDATION ENGINEERING
2.Course Code:
BCE 403
3.Semester / Year:
First Semester / Fourth Level
4.Description Preparation Date:
1/9/2025
5.Available Attendance Forms:
Mandatory
6.Number of Credit Hours (Total) / Number of Units (Total):
4 hours/ 3 Units
7.Course administrator's name (mention all, if more than one name)
Name: Dr.Tareq Hasan Mohammed Email: tarqrahal@ntu.edu.iq
8.Course Objectives

Course Objecti	Upon successful completion of this course, students will be able to: 1. Understand the fundamental interactions between different soil types and soil behavior under various loading and environmental conditions. 2. Classify and characterize soils using standard geotechnical procedures and laboratory/field data. 3. Design shallow foundations considering bearing capacity, settlement, and structural requirements. 4. Develop design methodologies for deep foundations such as piles and drilled shafts in different soil profiles. 5. Analyze the bearing capacity and predict settlements for various foundation systems using empirical and analytical methods. 6. Evaluate and apply soil improvement techniques to enhance foundation performance and ground stability. 7. Design and assess soil-retaining structures including gravity walls, cantilever walls, and mechanically stabilized earth (MSE) systems. 8. Conduct comprehensive geotechnical investigations and interpret site data to inform design and construction decisions. 9. Apply relevant national and international codes and standards in the design and analysis of geotechnical engineering projects.

9.Teaching and Learning Strategies	
Strategy	Student groups / case studies / preparing special reports

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Basic knowledge of the curriculum vocabulary, the purpose of conducting investigations, and methods of obtaining samples	Introduction - learning objectives, course content, The purpose of subsurface exploration Methods of Exploration, soil Soil Boring	Theoretical	Exams and reports
2	4	Knowing the engineering soil properties required	Engineering properties for foundation design, Cohesionless	Theoretical	Exams and reports

		for design and how to obtain them	Soil Sampling, Disturbed Sampling of All Soils		
3	4	Knowing how to conduct investigations in non-cohesive soils	Exploration (Undisturbed Sampling In Cohesive Soils)	Theoretical	Exams and reports
4	4	Knowing how to perform a burst cylinder test	Exploration (Spt Correlations)	Theoretical	Exams and reports
5	4	Knowing how to perform a shear fan test	Exploration (Vane Shear Test)	Theoretical	Exams and reports
6	4	Knowing how to perform a penetration cone test	Exploration Cone Penetration Test (CPT)	Theoretical	Exams and reports
7	4	Knowing how to do rock work	Exploration (Rock Sampling)	Theoretical	Exams and reports
8	4	Understand the theory of failure of soil and derive the Terzaki equation.	Bearing Capacity (Theory of failure modes, The Terzaghi Bearing-Capacity Equation, Example)	Theoretical	Exams and reports
9	4	Learn through examples how to calculate the load capacity using the Terzaki equation.	Bearing Capacity (Examples on Terzaghi Bearing-Capacity Equation, Modification of Bearing Capacity Equations for Water Table, Meyerhof 's Bearing-Capacity Equation, Example and H.W.)	Theoretical	Exams and reports
10	4	Learn to calculate soil bearing capacity using the Hansen equation.	Bearing Capacity (Hansen's Bearing-Capacity Method)	Theoretical	Exams and reports
11	4	Practical examples in calculating soil bearing capacity using the burst cylinder test	Bearing Capacity (Examples, Bearing Capacity From Spt)	Theoretical	Exams and reports
12	4	Knowing how to calculate load capacity when there are eccentric loads	Bearing Capacity (Footings With Eccentric or Inclined Loadings, Examples)	Theoretical	Exams and reports
13	4	Knowing how to design shallow foundations, strip foundation type	Design of Shallow Foundations (Design Concepts for a Rectangular Section in Bending, Design Example of a Continuous Wall Foundation, General Considerations)	Theoretical	Exams and reports
14	4	Knowing how to design shallow, single square foundations	Design of Shallow Foundations (Design Example of a Square Foundation for a Column)	Theoretical	Exams and reports
15	3		**Exam**		

11.Course Evaluation

40% Quest = 30% Mid + 10% (queues+ homework +reports) .60% Final Exam

12.Learning and Teaching Resources

Required textbooks (curricular books, if any	*1-Foundation Analysis and Design(*Edition: 5th Edition, Publisher: McGraw-Hill Education). *2*-Principles of Foundation Engineering (Edition: 9th Edition, Publisher: Cengage Learning)
Main references (sources)	*Foundation Analysis and Design(*Edition: 5th

	Edition, Publisher: McGraw-Hill Education).
Recommended books and references (scientific journals, reports...)	Tomlinson, M. J. and Woodward, J., (Foundation Design and Construction), 7 Edition, Pearson Education
Electronic References, Websites	

Design of Steel Structures

1.Course Name:					
Design of Steel Structures					
2.Course Code:					
BCE 404					
3.Semester / Year:					
1st Semester / 4th year					
4.Description Preparation Date:					
1/9/2024					
5.Available Attendance Forms:					
In-person - mandatory					
6.Number of Credit Hours (Total) / Number of Units (Total)					
Theoretical Hours=3, Practical Hours=1 /No. of Units=3					
7.Course administrator's name (mention all, if more than one name)					
Name: Dr. Mohammed Adnan Basher Email: mbasher@ntu.edu.iq					
8.Course Objectives					
Course Objectives	After successful completion of this course, the student will be able to understand the behavior and design principles of various types of structural steel members and their connections. The course provides educational experience in designing simple steel structures in accordance with standard codes. Emphasis is placed on understanding the application of AISC specifications, structural behavior under different loading conditions, and addressing both strength and serviceability criteria in design.				
9.Teaching and Learning Strategies					
Strategy	To effectively achieve the intended learning outcomes of this course, the following teaching and learning strategies will be employed: 1. Interactive Lectures and Conceptual Explanation: 2. Comparative Instruction and Analytical Discussion: 3. Design-Based Learning: 4. Hands-on Practice and Simulations: 5. Project-Based Learning and Group Assignments: 6. Case Studies and Industry Integration				
10.Course Structure					
Wee	**Hour**	**Required**	**Unit or subject name**	**Learnin**	**Evaluation**

k	s	Learning Outcomes		g method	method
1-3	4	Codes and shapes of steel	Introduction to Steel Structures	Lecture	Classwork
4&5	4	WSD,LSD methods	Design Principles	Lecture	Quizzes
6-8	4	Shear, moment design	Design of Steel Beams	Lecture	Homework
9-12	4	Column Buckling	Design of Steel columns	Lecture	Homework
13-15	4	Welded and bolted	Connections of steel structures	Lecture	Assignment

11.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Steel Design by William T. Segui
Main references (sources)	Design of Steel Structures by N. Subramanian
Recommended books and references (scientific journals, reports...)	Design of Steel Structures by S.K. Duggal
Electronic References, Websites	https://www.youtube.com/user/nptelhrd

Advanced Analysis and Design of Reinforced Concrete Structures

1.Course Name:	
Advanced Analysis and Design of Reinforced Concrete Structures	
2.Course Code:	
BCE405	
3.Semester / Year:	
Second / 4th	
4.Description Preparation Date:	
1/9/2024	
5.Available Attendance Forms:	
Compulsory	
6.Number of Credit Hours (Total) / Number of Units (Total)	
5 hours / 3 hours	
7.Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof. Dr. Hasan Mohammed Ahmed Albegmprli Email: albegmprli@ntu.edu.iq	
8.Course Objectives	
Course Objectives	Upon successful completion of this course, students will be able to: 1. Understand the structural behavior of reinforced concrete elements under various types of loading, including static and dynamic loads. 2. Develop analytical and design skills for advanced structural components such as deep beams, short shear cantilevers, and prestressed concrete members. 3. Apply national (Iraqi Code) and international (ACI) engineering codes for structural design, safety verification, and compliance. 4. Utilize advanced structural engineering software for the modeling, analysis,

	and design of reinforced concrete structures. 5. Evaluate the structural performance and resilience of concrete buildings subjected to special loading conditions, including seismic events. 6. Bridge theoretical understanding with practical engineering through the completion of real-world design projects. 7. Foster collaborative teamwork and enhance the ability to address and solve complex structural engineering challenges.

9.Teaching and Learning Strategies

Strategy	**1. Lectures** **2. Problem-Solving Sessions** **3. Case Studies** **4. Software Training** (e.g., SAP2000, ETABS, SAFE). **5. Group Discussions and Peer Learning** **6. Assignments and Homework** **7. Field Visits**

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	The Strut and tie methodology	Tie and Strut models	Presentation, explanation, questions and answers, discussion	Quiz HW
2	5	The ACI provisions for strut and tie models, Corbels design	Tie and Strut models	Presentation, explanation, questions and answers, discussion	Quiz HW
3	5	Design of Deep beams	Tie and Strut models	Presentation, explanation, questions and answers, discussion	Quiz HW
4	5	Shear walls, ACI code provisions for shear wall design	Concrete building systems	Presentation, explanation, questions and answers, discussion	Quiz HW
5	5	Design types of Stairs	Floor systems	Presentation, explanation, questions and answers, discussion	Quiz HW
6	5	Earthquake resistant design principles	Concrete building systems	Presentation, explanation, questions and answers, discussion	Quiz HW
7	5	Project	Project	Presentation, questions and answers, discussion	Direct questions
8	5	Site Visit	Site Visit	Presentation, explanation, questions and answers, discussion	Direct questions
9	5	Project discussion	Project discussion	Presentation, explanation, questions and answers, discussion	Direct questions
10	Mid Exam				
11	5	Demonstrates knowledge of the prestressing steel, and concrete for prestressed construction	Prestressed Concrete	Presentation, explanation, questions and answers, discussion	Quiz HW
12	5	Demonstrates knowledge of the Methods of prestressing	Prestressed Concrete	Presentation, explanation, questions and answers, discussion	Quiz HW
13	5	Demonstrates knowledge	Prestressed	Presentation, explanation,	Quiz

		of the Methods of prestressing	Concrete	questions and answers, discussion	HW
14	5	Project		Presentation, , discussion	Direct questions
15	5	Project discussion		Presentation, explanation, questions and answers, discussion	Direct questions

11.Course Evaluation
Continuous curriculum updates to keep pace with labor market developments, such as: Keeping up with updates in engineering codes. Enhancing practical and applied skills through the use of modern software. Meeting the requirements of academic accreditation. Developing learning outcomes to align with program outcomes and labor market needs. Increasing the course's relevance to

12.Learning and Teaching Resources	
Required textbooks	
Main references	Design of Concrete Structures –Nilson, Darwin, Dolan14thEd
Recommended books and references	•Structural Concrete-Theory and Design – Hassoun, Al-Manaseer 4thEd •ACI 318-14
Electronic References, Websites	https://www.youtube.com/@MrElgamal77

ADVANCED FOUNDATION ENGINEERING

1.Course Name:
ADVANCED FOUNDATION ENGINEERING
2.Course Code:
BCE 406
3.Semester / Year:
Second Semester / Fourth Level
4.Description Preparation Date:
1/9/2025
5.Available Attendance Forms:
Mandatory
6.Number of Credit Hours (Total) / Number of Units (Total):
(60) Hours
7.Course administrator's name (mention all, if more than one name)
Name: Tareq Hasan Mohammed Email: tarqrahal@ntu.edu.iq
8.Course Objectives

Course Objectiv	Upon successful completion of this course, students will be able to:

	1. Analyze and design deep foundation systems, including pile foundations, under various loading and soil conditions. 2. Design different types of retaining walls with consideration for earth pressure theories, stability, and structural performance. 3. Estimate and evaluate different types of settlements affecting foundations, including immediate, consolidation, and differential settlement. 4. Assess and calculate the ultimate bearing capacity of raft foundations using appropriate geotechnical methods. 5. Identify and integrate critical design and construction considerations for foundations on bulging piles and other challenging soil profiles.

9.Teaching and Learning Strategies

Strategy	Student groups / case studies / preparing special reports

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Learn about the types of retaining walls and their benefits	Deep of Foundation (Pile foundation)	Theoretical	Exams and reports
2	4	Knowing how to calculate the bearing capacity of a Piles in cohesive soils	Bearing capacity of single piles in Cohesive Soil	Theoretical	Exams and reports
3	4	Know how to calculate the ultimate load-bearing capacity of a pile by examining the penetration cone and the burst cylinder.	Bearing capacity of single piles (Correlations for Calculating Qp with SPT and CPT Results in Granular Soil)	Theoretical	Exams and reports
4	4	Knowing how to install the substrate on site	Pile Installation	Theoretical	Exams and reports
5	4	Knowing how to calculate the bearing capacity of a single pile in granular soils	Bearing capacity of single piles in in Granular Soil	Theoretical	Exams and reports
6	4	Knowing how to calculate the load-bearing capacity of a pile group	Bearing capacity of piles group	Theoretical	Exams and reports
7	4	Learn about the types of retaining walls and their benefits	Retaining Walls (Types of Retaining Walls)	Theoretical	Exams and reports
8	4	Knowing how to design a cantilever retaining wall.	Retaining Walls (Design of Cantilever Retaining walls)	Theoretical	Exams and reports
9	4	Practical examples on how to design a cantilever retaining wall	Retaining Walls (Examples on Design of Cantilever Retaining walls)	Theoretical	Exams and reports
10	4	Knowing how to design a gravity retaining wall	Retaining Walls (Design of gravity retaining wall)	Theoretical	Exams and reports
11	4	Knowing the types of settlements for shallow	Settlement of Shallow	Theoretical	Exams and reports

		foundations and how to calculate the elastic settlement of a shallow foundation in saturated clay soil	Foundations (Elastic Settlement of Shallow Foundation on Saturated Clay Examples)		
12	4	Knowing how to calculate the elastic settlement of a shallow foundation in granular soils	Settlement of Shallow Foundations (Elastic Settlement in Granular Soil, Examples)	Theoretical	Exams and reports
13	4	Knowing how to calculate the settlement of a shallow foundation from soil properties and load testing	Settlement of Shallow Foundations (Load Factors, Primary Consolidation Settlement, Field Load Test)	Theoretical	Exams and reports
14	4	Knowing the types of mat foundations and how to calculate the bearing capacity of the soil under this type of foundation	Mat Foundations (Types of Mat Foundations, Bearing Capacity of Mat Foundations)	Theoretical	Exams and reports
15	4	Learn about the general characteristics of expansive soils, how to calculate the percentage and pressure of expansive soils in the laboratory, and the procedures taken when constructing foundations on this type of soil.	Expansive Soils (General Nature of Expansive Soils, Swelling Pressure Test, Foundation Considerations for Expansive Soils, Construction on Expansive Soils)		

11.Course Evaluation
40% Quest = 30% Mid + 10% (queues+ homework +reports). 60% Final Exam

12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	*1-Foundation Analysis and Design(*Edition: 5th Edition, Publisher: McGraw-Hill Education). *2*-Principles of Foundation Engineering (Edition: 9th Edition, Publisher: Cengage Learning)
Main references (sources)	*Foundation Analysis and Design(*Edition: 5th Edition, Publisher: McGraw-Hill Education).
Recommended books and references (scientific journals, reports...)	Tomlinson, M. J. and Woodward, J., (Foundat Design and Construction), 7th Edition, Pear Education
Electronic References, Websites	

Advance Design of Steel Structures

1.Course Name:	
Advance Design of Steel Structures	
2.Course Code:	
BCE 407	
3.Semester / Year:	
2nd Semester / 4th year	
4.Description Preparation Date:	
1/9/2024	
5.Available Attendance Forms:	
In-Person (Mandatory)	
6.Number of Credit Hours (Total) / Number of Units (Total)	
Theoretical Hours=3, Practical Hours=1 /No. of Units=3	
7.Course administrator's name (mention all, if more than one name)	
Name: Dr. Mohammed Adnan Basher Email: mbasher@ntu.edu.iq	
8.Course Objectives	
Course Objectives	Upon successful completion of this course, students will be able to: 1. Understand the structural behavior and design principles of various types of structural steel members and connections under different loading conditions. 2. Design simple and complex steel structures, including trusses and bridges, in compliance with relevant design codes and standards (e.g., AISC). 3. Analyze and design bolted and welded steel connections used in structural systems. 4. Apply structural analysis and design principles in the design of steel trusses, considering geometry, load paths, and member forces. 5. Develop comprehensive design solutions for steel bridges, including superstructure and substructure components. 6. Utilize structural engineering software tools for modeling, analysis, and design of steel structures in practical and project-based contexts. 7. Integrate theoretical knowledge with real-world applications through design projects involving steel structures.
9.Teaching and Learning Strategies	
Strategy	To effectively achieve the intended learning outcomes of this course, the following teaching and learning strategies will be employed: 1. Interactive Lectures and Conceptual Explanation: 2. Comparative Instruction and Analytical Discussion: 3. Design-Based Learning: 4. Hands-on Practice and Simulations: 5. Project-Based Learning and Group Assignments: 6. Case Studies and Industry Integration

10.Course Structure

Week	Hours	Required	Unit or subject name	Learning	Evaluation

		Learning Outcomes		method	method
1-3	4	Analysis & design	Steel Trusses and Frames	Lecture	Homework
4&5	4	Lateral stability	Stability Analysis	Lecture	Homework
6-8	4	Deflection limits	Vibration Analysis	Lecture	Quizzes
9-12	4	AISC & Eurocode	Design Codes	Lecture	Classwork
13-15	4	Staad Pro.	Software tools to steel Design	Lecture	Assignment

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Steel Design by William T. Segui
Main references (sources)	Design of Steel Structures by N. Subramanian
Recommended books and references (scientific journals, reports...)	Design of Steel Structures by S.K. Duggal
Electronic References, Websites	https://www.youtube.com/user/nptelhrd

Construction Drawing

1.Course Name:

Construction Drawing	
2.Course Code:	
BCE408	
3.Semester / Year:	
Second Semester 2024–2025	
4.Description Preparation Date:	
1/9/2024	
5.Available Attendance Forms:	
In-Person (Mandatory)	
6.Number of Credit Hours (Total) / Number of Units (Total):	
3 hours / 1 credit	
7.Course administrator's name (mention all, if more than one name)	
Name: Jasim Mohammed Abd Email: jasimabd@ntu.edu.iq	
8.Course Objectives	
Course Objectives	Upon successful completion of this course, students will be able to: 1. Understand the fundamental principles and conventions of civil and structural engineering drawing. 2. Accurately read and interpret various types of engineering execution drawings, including plans, sections, and elevations. 3. Extract structural details such as reinforcement, cross-sections, and connection details from construction drawings. 4. Develop technical drawing skills using manual drafting techniques and computer-aided design (CAD) tools. 5. Produce clear, detailed, and accurate engineering layouts for structural components in accordance with industry standards. 6. Improve visualization and spatial interpretation abilities essential for professional engineering practice.
9.Teaching and Learning Strategies	
Strategy	**Knowledge** 1 – Identify types of civil and structural drawings 2 – Distinguish between different structural element details 3 – Explain how to derive longitudinal and cross sections 4 – Interpret commonly used symbols and notations **Skills** 1 – Draw detailed sections of structural elements 2 – Prepare reinforcement detailing plans 3 – Use basic engineering drawing software 4 – Analyze and interpret multistory structural plans **Values** 1 – Commit to precision and discipline in drawing 2 – Foster teamwork in drawing production 3 – Adhere to professional standards in drawing presentation 4 – Engage positively within the engineering work environment **Teaching Methods:** Lectures, practical sessions, case studies, applied projects

	Assessment Methods: Written exams, practical assignments, project evaluations, technical reports

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction to civil drawing and its applications	Introduction to civil drawing and its applications	Theoretical	Exams and reports
2	3	Concrete drawings and multistory sections	Concrete drawings and multistory sections	Theoretical and Practical Units	Exams and reports
3	3	Types of reinforced concrete foundations	Types of reinforced concrete foundations	Theoretical and Practical Units	Exams and reports
4	3	Types of reinforced concrete foundations	Types of reinforced concrete foundations	Theoretical and Practical Units	Exams and reports
5	3	Types of reinforced concrete foundations	Types of reinforced concrete foundations	Theoretical and Practical Units	Exams and reports
6	3	Column detailing	Column detailing	Theoretical and Practical Units	Exams and reports
7	3	Shear walls and staircase detailing	Shear walls and staircase detailing	Theoretical and Practical Units	Exams and reports
8	3	Shear walls and staircase detailing	Shear walls and staircase detailing	Theoretical and Practical Units	Exams and reports
9	3	Reinforced concrete beams	Reinforced concrete beams	Theoretical and Practical Units	Exams and reports
10	3	Reinforced concrete beams	Reinforced concrete beams	Theoretical and Practical Units	Exams and reports
11	3	Reinforced concrete beams	Reinforced concrete beams	Theoretical and Practical Units	Exams and reports
12	3	: Types of slabs and reinforcement details	: Types of slabs and reinforcement details	Theoretical and Practical Units	Exams and reports
13	3	Types of slabs and reinforcement details	Types of slabs and reinforcement details	Theoretical and Practical Units	Exams and reports
14	3	Types of slabs and reinforcement details	Types of slabs and reinforcement details	Theoretical and Practical Units	Exams and reports
15	3	Types of slabs and reinforcement details	Types of slabs and reinforcement details	Theoretical and Practical Units	

11.Course Evaluation

Updating curricula in alignment with labor market demands
Organizing seminars and academic conferences Following up on scientific advancements in the field

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Classrooms, laboratories, and workshops: Available Prescribed textbooks Available
Main references (sources)	Civil Engineering Drawing, M. Chakraborty Reinforced Concrete Detailing (BS, ACI) ACI Detailing Manual
Recommended books and references (scientific journals, reports...)	Classrooms, laboratories, and workshops: Available

Electronic References, Websites	-www.civilengineeringdrawing.com -www.autodesk.com -Department YouTube channel

Economic Engineering

1.Course Name:
Economic Engineering
2.Course Code:
BCE 409
3.Semester / Year:
2025/ Second semester
4.Description Preparation Date:
20/2/2025-18/5/2025
5.Available Attendance Forms:
15 weeks, 2 hours per week for each class
6.Number of Credit Hours (Total) / Number of Units (Total)
4 hours/ 3 Units
7.Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Eethar Thanon Dawood Email: eethardawood@nth.edu.iq
8.Course Objectives
The course is related to Economic Engineering which makes the student able to evaluate, estimate and calculate the economic factors that should be taken in consideration for any engineering project.
9.Teaching and Learning Strategies

Strategy	Individual learning Think-Pair-Share Prior knowledge Active engagement enhances learning. Clear learning goals promote student achievement. Feedback is essential for growth and improvement. Collaboration fosters deeper understanding.

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	6	Economic Engineering Planning	Design Process projects	Lecturing in class	Quiz or Homework
4-6	6	Importance of costs estimation for any project	Cost estimation	Lecturing in class	Quiz or Homework
7-9	6	Importance of of costs	Cost Index	Lecturing in	Quiz or

		index for estimation Other projects	methods	class	Homework
10	Mid term exam				
11-12	4	Different methods of Interest and Investment Calculations	Interest and Investment Costs	Lecturing in class	Quiz or Homework
13-15	6	Importance of Depreciation calculation	Depreciation calculation methods	Lecturing in class	Quiz or Homework

11.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any	Foundations of Engineering Economy
Main references (sources)	----
Recommended books and references (scientific journals, reports...)	INTRODUCTION TO ENGINEERING ECONOMICS
Electronic References, Websites	----

Hydrology

1.Course Name:	
Hydrology	
2.Course Code:	
BCE410	
3.Semester / Year:	
Second Semester/2024-2025	
4.Description Preparation Date:	
9/6/2025	
5.Available Attendance Forms:	
Face-to-face (in-class attendance)	
6.Number of Credit Hours (Total) / Number of Units (Total)	
2 Hours / 2 Units	
7.Course administrator's name (mention all, if more than one name)	
Name: Warqaa Thanoon Aness Email: Warqaa.th.aness@ntu.edu.iq	
8.Course Objectives	
Course Objectives	• To provide students with foundational knowledge in hydrology. • To understand the natural processes of the hydrologic cycle and the methods used to measure and analyze its components. • To apply hydrological knowledge in engineering contexts such as runoff estimation and the design of water control structures. • To develop students' skills in data analysis, interpretation, and the use of standard hydrological tools and methodologies.

9.Teaching and Learning Strategies	
Strategy	• Interactive theoretical lectures using PowerPoint presentations. • Class discussions to enhance conceptual understanding. • Solving practical exercises and case studies during lectures. • Assignments to reinforce analytical and problem-solving skills. • Encouraging student participation and reflective thinking.

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Identify the concept and applications of hydrology	Introduction to Hydrology	Lecture & Discussion	Theoretical Questions
2	2	Understand components of the hydrologic cycle	Hydrologic Cycle	Explanation + Diagram	Theoretical Questions
3	2	Recognize the importance and divisions of hydrology	Importance, Divisions & Limitations	PowerPoint + Discussion	Theoretical Questions
4	2	Identify types of precipitation	Types of Precipitation	Lecture	Theoretical Questions
5	2	Understand rainfall measurement methods	Rain Gauging Tools	Video + Explanation	Quiz
6	2	Analyze rainfall data	Rainfall Data Processing	Class Examples	Homework
7	2	Use depth-area and hyetograph curves	Graphical Rainfall Representation	Drawing & Analysis	Report
8	2	Apply frequency analysis to rainfall data	Statistical Rainfall Analysis	Practical Problems	Quiz
9	2	Understand types of hydrological losses	Introduction to Losses	Theoretical Explanation	Oral Questions
10	2	Identify evaporation and transpiration processes	Evaporation & Transpiration	Lecture + Diagrams	Homework
11	2	Analyze infiltration and temporary storage	Infiltration & Storage	Real-World Cases	Questions

12	2	Distinguish types of total losses	Total Hydrologic Losses	Comparative Analysis	Short Answer
13	2	Perform water balance calculations	Water Budget	Problem Solving	Quiz + Midterm
14	2	Apply hydrological data in engineering design	Engineering Applications	Case Study	Applied Test
15	2	Review and consolidate key concepts	Final Review	Interactive Session + Questions	Final Exam

11.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Subramanya, K. *Engineering Hydrology,* McGraw-Hill.
Recommended books and references (scientific journals, reports...)	Chow, V.T., Maidment, D.R., & Mays, L.W. *Applied Hydrology*. McGraw-Hill, 1988. Official materials from the Iraqi Ministry of Higher Education.
Electronic References, Websites	

Computer Application 3

1.Course Name:					
Computer Application 3					
2.Course Code:					
BCE 411					
3.Semester / Year:					
Fourth Year					
4.Description Preparation Date:					
01/04/2024					
5.Available Attendance Forms:					
Face-to-face (in-class attendance)					
6.Number of Credit Hours (Total) / Number of Units (Total)					
30 hours					
7.Course administrator's name (mention all, if more than one name)					
Name: Ban Ahmed Khalel Email: Warqaa.th.aness@ntu.edu.iq					
8.Course Objectives					
Course Objectives	This course provides essential concepts and learning outcomes expected from the student, proving whether the student has achieved maximum benefit from the available learning opportunities. It must be linked with the overall program description. **•Understanding Technical Fundamentals:** Introducing students to the concepts of structural design of buildings using computer programs (e.g., STAAD.Pro) and other relevant tools including foundation design with SAFE. **•Enhancing Design and Development Skills:** The course includes learning how to perform structural analysis and design of various types of structures using modern software and techniques, such as STAAD.pro, CONCAD, SAFE, CSI Bridge, Prokon, Epanet, and AutoCAD Land Development Desktop.				
9.Teaching and Learning Strategies					
Strategy	**Knowledge Objectives:** •Understand the use of engineering software for analysis and design. •Understand the analysis and design of different buildings. •Read and interpret structural data outputs. •Prepare complete technical reports using relevant programs. **Program-Specific Skills Objectives:** •Learn essential design principles through computerized methods. •Acquire knowledge, experience, and proficiency in software use. **Teaching & Learning Methods:** •Interactive explanation using modern teaching tools. •Application-oriented lectures simulating real engineering practice. •Homework assignments with daily participation grades. •Group-based practical tasks with collaboration.				
10.Course Structure					
Week	**Hours**	**Required**	**Unit or subject name**	**Learning**	**Evaluation**

		Learning Outcomes		method	method
1	5	Exams & Reports	Introduction to STAAD.Pro, Start the Program, Create a Structure	Theoretical & Practical	Theoretical Questions
2	5	Exams & Reports	Modeling Beam, Column, Slab, Wall using Graphical Interface	Theoretical & Practical	Theoretical Questions
3	5	Exams & Reports	Continue Modeling Elements (Beam, Column, Slab, Wall)	Theoretical & Practical	Theoretical Questions
4	5	Exams & Reports	Menu Bar (File, Edit, View, Tools)	Theoretical & Practical	Theoretical Questions
5	5	Exams & Reports	Menu Bar (Select, Geometry, etc.)	Theoretical & Practical	Quiz
6	5	Exams & Reports	Structural Analysis & Design Examples: Concrete Members, Loads (Wind, Earthquake, Temp)	Theoretical & Practical	Homework
7	5	Exams & Reports	Continue Structural Design with Load Combinations	Theoretical & Practical	Report
8	5	Exams & Reports	Foundation Design: Isolated, Strip, Raft, Pile Footings	Theoretical & Practical	Quiz
9	5	Exams & Reports	Continue Foundation Design Using STAAD.Foundation	Theoretical & Practical	Oral Questions
10	5	Exams & Reports	Steel Structure Design	Theoretical & Practical	Homework
11	5	Exams & Reports	Continue Steel Structure Design	Theoretical & Practical	Questions
12	5	Exams & Reports	Applications in Civil Engineering using: STAAD.Pro, SAFE, CSI Bridge, etc.	Theoretical & Practical	Short Answer

13	5	Exams & Reports	Slab Design using SAFE	Theoretical & Practical	Quiz + Midterm
14	5	Exams & Reports	Bridge Design using CSI Bridge	Theoretical & Practical	Applied Test
15	5	Exams & Reports	Continued Bridge Design with Advanced Loads	Theoretical & Practical	Final Exam

11.Course Evaluation

•Updating the curriculum to align with market demands.
•Organizing scientific seminars and conferences to modernize course content.
•Following recent scientific and technological advancements in structural design.

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Structural Analysis and Design Using STAAD.I V8i for Beginners
Main references (sources)	Computer Aided Structural Analysis and Desig
Recommended books and references (scientific journals, reports...)	Structural Concrete: Theory and Design
Electronic References, Websites	Structural Concrete: Theory and Design