

**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

2025–2026

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: The Department of Highway and Transportation Engineering at Mustansiriyah University aims to become a leading academic and research reference locally, regionally, and globally, contributing to the development of sustainable transportation systems and their infrastructure to enhance traffic safety in accordance with the highest scientific standards.

Program Mission: To provide high-quality education that prepares qualified engineers equipped with the scientific and practical skills necessary to meet the technical requirements of sustainable transportation infrastructure, in line with the latest technological and scientific advancements and the automation of its management

Program Objectives:

1. To continuously develop the academic curriculum to keep pace with the latest scientific advancements and employ various technologies for effective delivery, aiming to achieve learning outcomes aligned with comprehensive quality standards. This includes enhancing the educational infrastructure, such as laboratories and equipment, to provide an advanced and stimulating learning environment.

2. To promote scientific research in the field of sustainable transportation infrastructure, encourage publication in peer-reviewed scientific journals, and support the professional development of faculty members.
3. To qualify students and empower their practical competence in alignment with the evolving needs of the labor market. This includes supporting graduation projects and student innovation at both undergraduate and postgraduate levels, particularly those addressing challenges in the transportation sector.
4. To establish effective strategic partnerships with academic institutions, and both public and private sectors to exchange expertise, provide engineering consultancy, strengthen scientific collaboration, and promote professional training to develop practical solutions to transportation-related issues in society.

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 Form

University Name: Ashur University

Faculty/Institute: College of Engineering

Scientific Department: Civil Engineering Department

Academic or Professional Program Name: Civil Engineering

Final Certificate Name: B.Sc. in Civil Engineering

Academic System: Annual

Description Preparation Date: 29/1/2026

File Completion Date: 29/3/2026

Signature:

Head of Department Name:

Prof. Dr. Ali Jabbar Kadhim

Date:



Signature:

Scientific Associate Name:

Lecture Dr. Tareef Shukri Khaled

Date:

The file is checked by: Prof. Dr. Saad Sami Al-Khafaji

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 29-6-2026

Signature:



Approval of the Dean

Prof. Dr. Ali Hussein Ataiwi

1. Program Vision

Providing the labor market with armed engineering competencies with scientific and practical techniques, principles, and solid footing.

2. Program Mission

Excellence and interaction with the scientific and professional environment in meeting the requirements of society, development, and environmental protection.

3. Program Objectives

1. Providing the student with knowledge of the basic sciences.
2. Develop everything related to students' education and skills development at the level of preliminary studies through continuous studies of reality and the future.
3. Develop the department's performance and position in conducting applied research to solve the problems facing society in the specializations of Highway and Transportation engineering.
4. Encouraging scientific research to meet the requirements and needs and developing the road and transport engineering sector through training and continuing education that keeps pace with scientific development.
5. Develop the students' abilities to work as individuals or groups in the field of road design.
6. Qualifying engineers within the ethics of engineering work.
7. Qualifying engineers who are able to communicate and cooperate locally, regionally, and internationally.

4. Program Accreditation

None

5. Other external influences

None

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	18	8	basic
College Requirements	7	36	15	basic
Department Requirements	37	186	7	basic
Summer Training	yes			
Other				

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

7. Program Description

Level 1/ Semester 1

Code	Module	Theoretical	Practical
AU020201011	Mathematics-I	6	
AU020201012	Engineering Drawing	2	3
AU020201013	Engineering Mechanics-I	6	
AU020201014	Construction Materials	4	2
AU06	Arabic Language	2	
AU04	Computer	1	2

Level 1/ Semester 2

Code	Module	Theoretical	Practical
AU020201021	Mathematics-II	6	
AU020201022	Computer Aided Drawing (CAD)	2	2
AU020201023	Engineering Mechanics-II	6	
AU020201024	Engineering Statistics	4	
AU020201025	Geology	3	1

AU01	English Language	2	
AU02	Democracy and Human Rights	2	

Level 2/ Semester 3

Code	Module	Theoretical	Practical
AU020201031	Mathematics-III	6	
AU020201032	Strength of Materials-I	6	
AU020201033	Engineering Surveying-I	2	2
AU020201034	Concrete Technology -I	2	2
AU020201035	Fluid Mechanics-I	2	2
AU020201036	Building Construction	2	

Level 2/ Semester 4

Code	Module	Theoretical	Practical
AU020201041	Engineering Analysis	4	
AU020201042	Strength of Materials-II	4	
AU020201043	Engineering Surveying-II	2	2
AU020201044	Fluid Mechanics-II	2	1
AU020201045	Concrete Technology -II	2	2
AU03	Crimes of the Ba'ath Regime in Iraq	2	
AU16	Arabic Language-II	2	
AU14	Computer-II	1	2
AU11	English Language-II	2	

Level 3/ Semester 5

Code	Module	Theoretical	Practical
AU020201051	Structural Analysis-I	4	
AU020201052	Soil Mechanics-I	4	2
AU020201053	Reinforced Concrete Design-I	4	

AU020201054	Numerical Methods	4	
AU020201055	Construction Projects Management	2	2
AU020201056	Engineering Irrigation and Drainage	2	

Level 3/ Semester 6

Code	Module	Theoretical	Practical
AU020201061	Structural Analysis-II	4	
AU020201062	Soil Mechanics-II	4	2
AU020201063	Reinforced Concrete Design-II	4	
AU020201064	Transportation Engineering -I	3	1
AU020201065	Hydrology	4	
AU020201066	Engineering Economy	4	

	Code	Module	Prac.	Tut.	Theo.	Prac.	Tut.	Theo.	Credit
Fourth year	50601401	Foundations Engineering	3	1	---	3	1	---	6
	50601402	Transportation Engineering	2	1	1	2	1	1	5
	50601403	Sanitary & Environmental Engineering	2	1	1	2	1	1	5
	50601404	Reinforced Concrete Design II	2	1	---	2	1	---	4
	50601405	Structural Steel Design	2	2	---	2	2	---	4
	50601406	Design of Hydraulic Structures	2	1	---	2	1	---	4
	50601407	Constructional Methods & Estimation	2	1	---	2	1	---	4
	50601408	Engineering Project	1	---	2	1	---	2	4
	50601409	English Language IV	2	---	---	2	---	---	2

8. Expected learning outcomes of the program

Knowledge

Learning Outcomes 1	1. An ability to identify, formulate, and solve engineering in Highway and transportation engineering problems by applying principles of engineering, science, and mathematics.
Learning Outcomes 2	2. An ability to apply the engineering design process to produce solutions that meet specified needs with consideration for Transportation and traffic, safety,

	highways, environmental, economic, and other factors as appropriate to the discipline.
Learning Outcomes 3	3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
Skills	
Learning Outcomes 4	4. An ability to communicate effectively with a range of audiences
Learning Outcomes 5	5. An ability to recognize the ongoing need to acquire new knowledge, choose appropriate learning strategies, and apply this knowledge
Ethical	
Learning Outcomes 6	6. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
Others	
Learning Outcomes 7	7. An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment.
9. Teaching and Learning Strategies	
- Include the program syllabus a variety of ways with the provision for each method (advantages and disadvantages). - Include the program syllabus issues and real problems and motivate students to express their views and proposed solutions to optimized method to address the problems and challenges. - the adoption of approach of continuous improvement of all the different events and activities to ensure achievement the message and objectives approved by the college and quality standards.	
10. Evaluation methods	
1-Weekly Quizzes. 2-Oral exam in the classroom. 3- Submitting homework assignments. 4- Submitting homework reports. 5- Mid-term exam. 6- Final Exam.	

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Civil Engineering	Project Management			1	
Assistant Professor	Civil Engineering	Highway and Transportation			1	1
Assistant Professor	Civil Engineering	Geotechnics				1
Assistant Professor	Civil Engineering	Structures				1
Lecturer	Civil Engineering				1	
Lecturer	Civil Engineering	Transportation Engineering			1	
Assistant Lecturer	Remote Sensing Science	Petroleum geologist			1	
Assistant Lecturer	Civil Engineering	Structures			1	
Assistant Lecturer	Civil Engineering	Project Management			1	
Assistant Lecturer	Civil Engineering	Construction Materials			1	
Assistant Lecturer	Civil Engineering	Transportation Engineering			1	
Assistant Lecturer	Water Resources Engineering	Water Resources			1	
Assistant Lecturer	Construction engineering	Project Management			1	
Assistant Lecturer	Materials Engineering	General Materials			3	1
Assistant Lecturer	Architecture Engineering	Urban Planning				1

Professional Development
Mentoring new faculty members
The process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level, is by enrolling them with the senior professors and holding meetings to develop their experiences.
Professional development of faculty members
The academic and professional development plan and arrangements for faculty includes teaching and learning strategies, assessment of learning outcomes, professional development, by training courses and workshops.
1. Acceptance Criterion
Enrollment in the department by central admission of the ministry of higher education and scientific research.

2. The most important sources of information about the program
Website of Ashur university https://www.au.edu.iq/dept.php?id=5
3. Program Development Plan
Keeping abreast of developments in the field of civil engineering and adopting the latest scientific sources, references, and methods, including: ✓ Textbooks ✓ External supplementary resources ✓ Scientific resources on reputable websites (Internet) ✓ Paper and electronic lectures by the course instructor Relevant videos presented by the instructor

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

Program Skills Outline										
Year/Level	Course Code	Course Name	Basic or optional	Required program Learning outcomes						
				Knowledge			Skills		Ethics	Others
				A1	A2	A3	B1	B2	C1	D1
Fourth year	50601401	Foundations Engineering	basic	*	*					
	50601402	Transportation Engineering	basic	*	*					
	50601403	Sanitary& Environmental Engineering	basic	*	*					
	50601404	Reinforced Concrete Design II	basic	*	*					
	50601405	Structural Steel Design	basic	*						
	50601406	Design of Hydraulic Structures	basic	*	*					
	50601407	Constructional Methods & Estimation	basic	*		*				
	50601408	Engineering Project	basic				*	*		*
	50601409	English Language IV	basic				*			

Course Description Form

1. Course Name:	
Foundation Engineering	
2. Course Code:	
50601401	
3. Semester / Year:	
2026-2025	
4. Description Preparation Date:	
2026-4-10	
5. Available Attendance Forms:	
Weekly lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
180 hours/ 6 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof Dr. Rana Amir Yousif Email: eng.ranaa.y@uomustansiriyah.edu.iq	
8. Course Objectives	
Course Objectives	The academic program aims to learn the student about all structural parts lies below ground surface level, and it also contain the information about soil investigation that should be available to design these parts. Program therefore covers the study for all footing types that can be divided mainly to shallow and deep foundation capacity to resists external forces or loads and exploring soil property by site investigation and soil laboratory tests. Evaluating of soil lateral earth pressure and its applications like sheet piles, retaining walls and bridge abutment was also learned in the course.
9. Teaching and Learning Strategies	
Strategy	- Include the program syllabus a variety of ways with the provision for each method (advantages and disadvantages). - Include the program syllabus issues and real problems and motivate students to express their views and proposed solutions to optimized method to address the problems and challenges. - The adoption of approach of continuous improvement of all the different events and activities to ensure achievement the message and objectives approved by the college and quality standards.

10. Course Structure					
Week	hrs	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1-4	16	Knowing soil properties	• Soil site investigation. • Purpose of Soil investigation. • Planning of Soil investigation • Methods of Soil investigation.	Conventional use of computers and means of explanation	Daily & monthly exams
5-6	8	Knowing shallow footing bearing capacity for applied loads	• shallow footing bearing capacity • Computing footing bearing capacity according to Terzaghi, Myerhof and Hansen methods	Conventional use of computers and means of explanation	Daily & monthly exams
7-10	16	Expecting the shallow footing settlement under applied loads	• Computing the increment in stresses • shallow footing settlement • Computing the shallow footing immediate settlement • Computing the shallow footing consolidation settlement	Conventional use of computers and means of explanation	Daily & monthly exams
11	4	Knowing the lateral earth pressure value	lateral earth pressure	Conventional use of computers and means of explanation	Daily & monthly exams
12	4	Capability of using sheet piles within available sizes	Sheet piles and retaining walls	Conventional use of computers and means of explanation	Daily & monthly exams
13	4	Definition of deep foundation	Deep foundation	Conventional use of computers and means of explanation	Daily & monthly electronic exams

14-15	8	Uses of deep foundation and there limitations	Piles and piers	Conventional use of computers and means of explanation	Daily & monthly electronic exams
16-17	8	Knowing methods of computing pile capacities and there types	Static and dynamic pile loading tests	Conventional use of computers and means of explanation	Daily & monthly exams
17-19	12	Retaining Structures	- Retaining walls - Stability of Retaining Walls	Conventional use of computers and means of explanation	Daily & monthly exams
20-22	12	Sheet pile walls	Types and stability	Conventional use of computers and means of explanation	Daily & monthly exams
23-26	16	Stability of Slopes	- Finite Slopes - Stability of Slopes	Conventional use of computers and means of explanation	Daily & monthly exams
27-30	16	Deep Foundations	- Pile Foundation - Group of Pile Foundation	Conventional use of computers and means of explanation	Daily & monthly exams

11. Infrastructure

Required reading: - CORE TEXTS - COURSE MATERIALS - OTHER	- FOUNDATION ANALYSIS AND DESIGN Fifth Edition Joseph E. Bowles, RE., S.E. - Principles of Foundation Engineering, SI Seventh Edition BRAJA M. DAS
Special requirements (include for example workshops, periodicals, IT software, websites)	- soil site investigation reports - ARPN Journal of Engineering and Applied Sciences - Al-Nahrain University, College of Engineering Journal (NUCEJ) http://civildigital.com/ground-improvement-techniques-complete-list-of-methods-classifications/

	5. http://www.iasj.net/iasj?func=issueTOC&isId=118&uiLanguage=ar. 6. https://www.google.iq/webhp?ei=KD1jWKeHJsHa6AT6wpe4Dw&ved=0EKkuCAYoAQ#q=geomechanics+and+engineering+reviewer+team++journal. 7. http://www.icevirtuallibrary.com/doi/abs/10.1680/geot.1973.23.2.151.
Community-based facilities (Include for example, guest Lectures, internship , field studies)	

Course Description Form

1. Course Name:	
Transportation Engineering	
2. Course Code:	
50601402	
3. Semester / Year:	
2026-2025	
4. Description Preparation Date:	
2026-4-5	
5. Available Attendance Forms:	
Weekly lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 hours/ 4 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof Dr. Rana Amir Yousif Email: eng.ranaa.y@uomustansiriyah.edu.iq	
8. Course Objectives	
Course Objectives	The curriculum includes providing the college of Engineering, Department of Civil, with information about road engineering (transportation) and the structural design mechanism for paving that serves them in their field of specialization.
9. Teaching and Learning Strategies	
Strategy	- Include the program syllabus a variety of ways with the provision for each method (advantages and disadvantages). - Include the program syllabus issues and real problems and motivate students to express their views and proposed solutions to optimized method to address the problems and challenges. - The adoption of approach of continuous improvement of all the different events and activities to ensure achievement the message and objectives approved by the college and quality standards.

10.Course Structure					
Week	hrs	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	4	Understanding the historical background of roads and their development	Highway Engineering Principle and Construction Development	Conventional use of computers and means of explanation	Daily & monthly exams
5-2	16	Key elements of engineering design and the mechanism for choosing the best route	Highway Location / Highway alignment , Element of Geometric Design	Conventional use of computers and means of explanation	Daily & monthly exams
7-6	8	How to calculate earthworks in terms of quantity and cost	Earth work and Mass Haul Diagram	Conventional use of computers and means of explanation	Daily & monthly exams
8-10	12	The mechanism for classifying soil supporting paving (natural soil).	Subgrade Soil Classification and Embankment foundation	Conventional use of computers and means of explanation	Daily & monthly exams
11	4	Understanding the types of road pavement (flexible and rigid) and their properties	Road and Highway Pavement Structure	Conventional use of computers and means of explanation	Daily & monthly exams
13-12	8	Identifying the main components of paving materials	Paving Materials	Conventional use of computers and means of explanation	Daily & monthly exams
16-14	12	Asphalt binder: its main characteristics and tests	Asphalt Cement Properties	Conventional use of computers and means of explanation	Daily & monthly exams
19-17	12	Characteristics of kidney stones (coarse and fine) and the most important tests	Aggregate Combinations	Conventional use of computers and means of explanation	Daily & monthly exams
22-20	12	The most important tests for different types of paving mixtures	Mixture Design and Properties	Conventional use of computers and means of explanation	Daily & monthly exams

25-23	12	Understanding the components of rigid paving, including key joints, ties, and reinforcement.	Rigid Pavement Joints and Reinforcement	Conventional use of computers and means of explanation	Daily & monthly exams
28-26	9	Key factors in flexible design according to international standards	AASHTO Flexible Pavement Design	Conventional use of computers and means of explanation	Daily & monthly exams
30-29	8	Important factors in rigid design according to international standards	AASHTO Rigid Pavement Design	Conventional use of computers and means of explanation	Daily & monthly exams

11. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1. AASHTO, "AASHTO Guide for Design of Pavement Structures", 1993. 2. Huang, Y.H., "Pavement Analysis and Design", Prentice Hall, New Jersey, 1993. 3. Yoder , E. J. & Witczek , M. W. " Principles of Pavement Design " 2nd edition-1975.
Special requirements (include for example workshops, periodicals, IT software, websites)	Arabic and foreign Transportation engineering books related to the subject
Community-based facilities (include for example, guest Lectures , internship , field studies)	

Course Description Form

1. Course Name:	
Sanitary& Environmental Engineering	
2. Course Code:	
50601403	
3. Semester / Year:	
2026-2025	
4. Description Preparation Date:	
2026-4-5	
5. Available Attendance Forms:	
Weekly lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
150 hours/ 5 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Sabah Noori Hammoodi Email: sabah.noori@au.edu.iq	
8. Course Objectives	
Course Objectives	The course introduces students to the principles of water and wastewater engineering, including water supply and wastewater disposal systems, water and wastewater treatment, water quality and indicators pump selection and placement and pipe networks. Topics include water quality parameters, guidelines and water quality frameworks; sewage collection systems; pumping stations and rising mains, sludge treatment and management, and water management concepts and effluent reuse. Treatment of environmental pollution , waste pollution in general and river pollution.
9. Teaching and Learning Strategies	
Strategy	- Include the program syllabus a variety of ways with the provision for each method (advantages and disadvantages). - Include the program syllabus issues and real problems and motivate students to express their views and proposed solutions to optimized method to address the problems and challenges. - The adoption of approach of continuous improvement of all the different events and activities to ensure achievement the message and objectives approved by the college and quality standards.

10.Course Structure					
Week	hrs	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	Coarse overview, Introduction Water resources , Environment elements, pollution , Water supply and Sewerage	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
2-4	6	Consumption of water , Fire demand, Forecasting population and design period	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
5-6	4	Distribution of water :types of pipes , method of distribution ,water quality, distribution system patterns.	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
7-9	6	Design of water distribution systems : Flow in pipes, velocity and pressure, Hazen – Williams equation, water network analysis, equivalent pipe method and Hardy – Cross method.	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
10-13	8	Pumps : classification of pumps, work and efficiency of pumps, centrifugal pumps , NPSH	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
14	2	Water treatment plants :Intake and Mixing	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
15-16	4	Water treatment plants : coagulation	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
17	2	Water treatment plants : sedimentation	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams

18	2	Water treatment plants :Filtration	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
19	2	Water treatment plants : disinfection	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
20	2	Characterization and composition of wastewater.	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
21-22	4	Physical tests of wastewater and solid materials.	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
23	2	BOD Calculations and Thomas Graphic method	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
24	2	River pollution and Its calculations	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
25	2	Treatment of wastewater: design of wastewater network and the design limits	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
26-28	6	Wastewater treatment plants	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
29	2	Design of Grit Chamber	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams
30	2	Design of precipitation Tanks and Calculations	Sanitary and environmental engineering	Conventional use of computers and means of explanation	Daily & monthly exams

11.Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1- M.J. Hammer & M . J . Hammer Jr , .Water and Wastewater Technology , (7th Edition) ,Prentice Hall , 2013 2- Metcalf & Eddy , Wastewater Engineering Treatment and Resources Recovery (5th Edition) , Mc Graw – Hill , 2013
Special requirements (include for example workshops, periodicals, IT software, websites)	1- M.J. Hammer & M . J . Hammer Jr , .Water and Wastewater Technology , (7th Edition) ,Prentice Hall , 2013 2- - Metcalf & Eddy , Wastewater Engineering Treatment and Resources Recovery (5th Edition) , Mc Graw – Hill , 2013
Community-based facilities (include for example, guest Lectures , internship , field studies)	

Course Description Form

1. Name Course	
Reinforced Concrete Design II	
2. Code Course	
50601404	
3. Semester / Year	
2025-2026	
4. Date of Preparation this Description	
5-4-2026	
5. Forms Attendance Available	
Weekly Lectures	
6. Number Hours) Total (/ Number Units) Total (	
120 hours / 4 units	
7. Name Coordinator Course) (if more than Name (	
Name: Lect. Dr. Sabah Noori Hamoudi	
Email: Sabah.noori@au.edu.iq	
8. Course Objectives	
Subject Objectiv	This program aims to teach students the most important methods and techniques available for the analysis and design of reinforced concrete structures. Students will learn to analyze and design concrete slabs using the Direct Design Method, analyze slabs using Yield Line Theory, analyze and design slender columns, analyze and design foundations of various types, and analyze and design prestressed concrete elements.
9. Teaching and Learning Strategies	
Strategy	Adopting an approach of theoretical and practical lectures at a rate of four hours per week, with one or two hours weekly for discussion, encouraging critical thinking and solving real design problems. Emphasis is placed on interactive lectures and designing simplified structures.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit / Topic Name	Teaching Method	Assessment Method
1	5	Reinforced Concrete Slab Systems	Reinforced Concrete Slabs	Theoretical Lecture	Quizzes and Reports
2	5	Types of Two-Way Slabs and Their Analysis Methods	Reinforced Concrete Slabs	Theoretical Lecture	Assignments
3	8	Introduction to the ACI Direct Design Method	Direct Design Method	Theoretical Lecture	Quizzes
4	6	Moments Using the Direct Design Method	Direct Design Method	Theoretical Lecture	Reports
5	10	Design of Two-Way Slab and Beam Systems	Two-Way Slab and Beam Systems	Theoretical Lecture and Applications	Assignments
6	6	Design of Flat Plate Slab Systems	Flat Plate Slab Systems	Theoretical Lecture and Applications	Tests
7	6	Shear in Two-Way Slab Systems	Shear in Slabs	Theoretical Lecture	Reports
8	10	Design of Shear Head Reinforcement	Shear Head Reinforcement	Applications	Exams
9	8	Design of Drop Panels for Shear	Drop Panels	Applications	Assignments
10	8	Design of Waffle (Ribbed) Slab Systems	Waffle Slab System	Theoretical Lecture and Applications	Reports
11	8	Introduction to Plastic Analysis	Plastic Analysis	Theoretical Lecture	Tests
12	8	Yield Line Theory for Slab Systems	Yield Line Theory	Theoretical Lecture	Assignments
13	8	Analysis of Isotropically Reinforced Slabs Using Yield Line Theory	Isotropically Reinforced Slab Systems	Theoretical Lecture and Applications	Reports
14	8	Analysis and Design of Orthotropically Reinforced Slabs Using Yield Line Theory	Orthotropically Reinforced Slab Systems	Theoretical Lecture and Applications	Exams
15	8	Analysis of Slabs Under Concentrated Load	Slabs Under Concentrated Load	Theoretical Lecture and Applications	Final Evaluation

		Using Yield Line Theory			
16	5	Slender Columns – Basic Concepts	Slender Columns	Theoretical Lecture	Quizzes and Reports
17	5	Analysis of Braced Columns	Braced Columns	Theoretical Lecture	Assignments
18	8	Design of Braced Columns	Braced Columns	Theoretical Lecture and Applications	Quizzes
19	6	Analysis of Unbraced Columns	Unbraced Columns	Theoretical Lecture	Reports
20	10	Design of Unbraced Columns	Unbraced Columns	Theoretical Lecture and Applications	Assignments
21	6	Slender Columns Under Biaxial Moments	Slender Columns Loaded with Biaxial Moments	Theoretical Lecture and Applications	Tests
22	6	Types of Reinforced Concrete Foundations	Foundations	Theoretical Lecture	Reports
23	10	Design of Isolated Column Footings	Isolated Column Footings	Theoretical Lecture and Applications	Exams
24	8	Design of Wall Footings	Wall Footings	Applications	Assignments
25	8	Design of Combined Footings	Combined Footings	Theoretical Lecture and Applications	Reports
26	8	Design of Pile Caps	Pile Caps	Theoretical Lecture and Applications	Tests
27	8	Prestressed Concrete (Basic Concepts)	Prestressed Concrete	Theoretical Lecture	Assignments
28	8	Losses in Prestressed Concrete Elements	Losses in Prestressed Elements	Theoretical Lecture	Reports
29	8	Analysis of Prestressed Concrete Beams	Prestressed Concrete Beams	Theoretical Lecture and Applications	Exams
30	8	Design of Prestressed Concrete Beams	Prestressed Concrete Beams	Theoretical Lecture and Applications	Final Evaluation

11. Course Evaluation	
• Preparation of classroom and homework assignments. • Monthly and daily quizzes. • Class participation. • Final Examinations	
12. Learning and Teaching Resources	
a. Required Textbooks	1- Reinforced Concrete Structures by Nilson et al. - ACI Code 318M-011 2- Arabic and foreign reinforced concrete engineering books relevant to the subject 3- All scientific websites within the specialization of reinforced concrete design
b. Main References (Sources)	1- R.C. Design Handbook - ASCE Journal Structural Division - ACI Journal - Civil Engineer Journal
	1- Arabic and foreign reinforced concrete engineering books relevant to the subject
c. Recommended Books and References (Scientific journals, reports, etc.)) :	It is beneficial to reinforce the theoretical and practical aspects through scientific visits to reinforced concrete construction projects underway, and to adopt continuous improvement of all activities to ensure achievement of the approved objectives and quality standards.

Course Description Form

1. Course Name	
Structure Steel Designs	
2. Course Code	
50601405	
3. Semester / Year	
2025-2026	
4. Date of Preparation of this Description	
15-4-2026	
5. Available Attendance Forms	
Weekly Lectures	
6. Total Study Hours / Total Credit Units	
120 hours / 4 units	
7. Course Coordinator Name (mention if more than one)	
Name: Asst. Prof. Abdulkareem Naji Aboud Email: abdulkareem.naji@au.edu.iq	
8. Course Objectives:	
Course Subject Objectives	The curriculum provides the College of Engineering, Department of Civil Engineering, with information on the design of steel structures and the design methodology for steel structures subjected to tension and compression forces that serve them in their field of specialization.
9. Teaching and Learning Strategies	
Strategy	The program curriculum was incorporated using various methods, with the advantages and disadvantages of each method clarified. Real-world issues and problems were incorporated into the program curriculum, and students were encouraged to express their opinions and suggest solutions to arrive at the best approach for addressing these problems and challenges. A continuous improvement approach was adopted for all activities and events to ensure the achievement of the college's approved mission, objectives, and quality standards.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit Name / Topic	Teaching Method	Assessment Method
1	4	Introduction	Introduction	Traditional & Computer-aided with Visual Aids	Daily, Weekly & Monthly Exams
2-6	20	Simple Connection Design – Using Bolts and Welding	Simple Connection Design – Using Bolts and Welding	Traditional & Computer-aided with Visual Aids	Daily, Weekly & Monthly Exams
7-10	16	Design of Structural Members under Tension Forces	Design of Structural Members under Tension Forces	Traditional & Computer-aided with Visual Aids	Daily, Weekly & Monthly Exams
11-14	16	Design of Structural Members under Compression Forces	Design of Structural Members under Compression Forces	Traditional & Computer-aided with Visual Aids	Daily, Weekly & Monthly Exams
15	4	Design of Column Bases	Design of Column Bases	Traditional & Computer-aided with Visual Aids	Daily, Weekly & Monthly Exams
16-20	20	Beam Design	Beam Design	Traditional & Computer-aided with Visual Aids	Daily, Weekly & Monthly Exams
21-25	20	Design of Members under Bending and Axial Compressive Forces	Design of Members under Bending and Axial Compressive Forces	Traditional & Computer-aided with Visual Aids	Daily, Weekly & Monthly Exams
26-30	20	Design of Column-to-Beam Connections	Design of Column-to-Beam Connections	Traditional & Computer-aided with Visual Aids	Daily, Weekly & Monthly Exams

11.Course Assessment

Completion of in-class and homework assignments.
Monthly and daily exams.
Final exams.

12.Learning and Teaching Resources

1. Required Textbooks	AISC-steel manual 13th Ed. (LRFD method)
2. Main References (Sources)	"Steel structure design and behavior", 5th Ed., C. G. Salmon and F. A. Malhas
a. Recommended Books and References (Scientific Journals, Reports, ...)	Foreign steel structure engineering books relevant to the subject
b. Electronic References, Internet Sites	All scientific websites within the specialty of steel structure engineering

Course Description Form

1. Course Name:	
Design of Hydraulic Structures	
2. Course Code:	
50601406	
3. Semester / Year:	
2026-2025	
4. Description Preparation Date:	
2026-4-5	
5. Available Attendance Forms:	
Weekly lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 hours/ 4 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof Dr. Rana Amir Yousif Email: eng.ranaa.y@uomustansiriyah.edu.iq	
8. Course Objectives	
Course Objectives	The course introduces students to the The study of hydraulic structures relies on applying the principles of fluid mechanics and water engineering to design and analyze structures that handle water (storage, transport, regulation). These fundamental principles encompass hydraulic, structural, and geotechnical aspects to ensure the efficiency and safety of the structure.
9. Teaching and Learning Strategies	
Strategy	- Include the program syllabus a variety of ways with the provision for each method (advantages and disadvantages). - Include the program syllabus issues and real problems and motivate students to express their views and proposed solutions to optimized method to address the problems and challenges. - The adoption of approach of continuous improvement of all the different events and activities to ensure achievement the message and objectives approved by the college and quality standards.

10. Course Structure					
Week	hrs	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1-3	6	Types of Hydraulic Structures	1. Storage Structure 2. Conveyance Structure 3. Flow Diversion Structures 4. Flow Measurement Structures 5. Energy Dissipation Structures 6. Power Stations 7. Energy Dissipation Structures 8. Power Stations 9. Sediment and Chemical Control Structures 10. River Training and Waterway Stabilization Structures	Conventional use of computers and means of explanation	Daily & monthly exams
4-6	6	Theories of Seepage	Causes of failure of weir or barrage on permeable foundation	Conventional use of computers and means of explanation	Daily & monthly exams
7-10	8	Safety Against Piping or Undermining	1. Safety Against Uplift Pressure 2. Lane's Weighted Creep Theory 3. Khosla's Theory and Concept of Flow Nets	Conventional use of computers and means of explanation	Daily & monthly exams
11-13	6	Safety Against Piping or Undermining	Khosla's Method of Independent Variables for Determination of Pressures and Exit Gradient for Seepage Below a Weir or a Barrage	Conventional use of computers and means of explanation	Daily & monthly exams
14-17	8	Culvert	1. Design of Culvert 2. Structural Design of Culvert	Conventional use of computers and means of explanation	Daily & monthly exams
18-20	6	Regulators	1. Hydraulic Design 2. Hydraulic Calculation of Regulators Velocity and Discharge	Conventional use of computers and means of explanation	Daily & monthly exams
21-23	6	Regulators	Structural Design of Regulators	Conventional use of computers	Daily & monthly exams

				and means of explanation	
24-26	6	Hydraulic Jumps	1. Energy Loss in Hydraulic Jumps 2. Types of jump	Conventional use of computers and means of explanation	Daily & monthly exams
27-28	4	Standard Stilling Basins	1. Chute blocks 2. Impact blocks (Baffle piers) 3. End Sills	Conventional use of computers and means of explanation	Daily & monthly exams
29-30	2	Standard Stilling Basins	Type Stilling Basins and Energy Dissipaters	Conventional use of computers and means of explanation	Daily & monthly exams

11.Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	1- Sheng-Hong Chen, hydraulic Structures , (7th Edition) ,Springer , 2015 DOI 10.1007/978-3-662-47331-3
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	

Course Description Form

1. Course Name	
Construction Methods and Estimation	
2. Course Code	
50601407	
3. Semester / Year	
2025-2026	
4. Date of Preparation of this Description	
5-4-2026	
5. Available Attendance Forms	
Weekly Lectures	
6. Total Study Hours (Overall) / Total Credit Units (Overall)	
120 hours / 4 units	
7. Course Coordinator Name (mention if more than one)	
Name: Lect. Dr. Sabah Noori Hamoudi Email: Sabah.noori@au.edu.iq	
8. Course Objectives:	
Course Subject Objectives	The course aims to introduce civil engineering students to the fundamental concepts of various construction methods and estimation techniques, as well as quantity surveying in engineering projects. It also seeks to develop their skills in analyzing construction items, calculating quantities, and preparing bills of quantities for various civil engineering projects.

9. Teaching and Learning Strategies

Strategy

Using theoretical lectures and visual demonstrations to explain fundamental concepts.
Encouraging students to participate in solving engineering problems related to estimation and quantity surveying.
Using computer software and modern tools in quantity takeoff and estimation.
Developing students' critical thinking and analytical skills through practical projects and reports.

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit Name / Topic	Teaching Method	Assessment Method
1-2	5	Identify fundamentals of construction methods	Introduction to Construction Methods	Lectures & Demonstrations	Tests & Reports
3-4	5	Understand site works and excavation	Excavation and Earthworks	Lectures & Practical Work	Assignments
5-6	8	Identify concrete works	Concrete Works	Lectures & Demonstrations	Quizzes
7-8	6	Know reinforcement and formwork	Reinforcement and Formwork	Lectures & Applications	Reports
9-10	10	Understand masonry works	Wall Construction	Lectures	Assignments
11-12	6	Identify finishing works	Finishing Works and Insulation	Lectures & Demonstrations	Tests
13-14	6	Extract quantities from drawings	Quantity Surveying	Practical Application	Reports
15-16	10	Prepare bills of quantities	Bill of Quantities (BOQ)	Lectures & Computer	Exams

17-18	8	Analyze construction items	Price Analysis	Lectures	Assignments
19-20	8	Conduct preliminary estimation	Preliminary Estimation	Applications	Reports
21-22	8	Calculate material costs	Material Cost Estimation	Lectures	Tests
23-24	8	Calculate labor costs	Labor Cost Estimation	Lectures	Assignments
25-26	8	Calculate equipment costs	Equipment Cost Estimation	Applications	Reports
27-28	8	Prepare final project cost	Final Project Cost	Lectures & Computer	Exams
29-30	8	Prepare an integrated applied project	Integrated Estimation Project	Discussion Session	Final Assessment

11.Course Assessment

Completion of in-class and homework assignments.
Daily and monthly exams.
Class participation.
Final exams.

12.Learning and Teaching Resources

1. Required Textbooks	Building Construction Handbook. Estimating and Costing for Civil Engineering Works.
2. Main References (Sources)	Quantity Surveying Practice
a. Recommended Books and References (Scientific Journals, Reports, ...)	Iraqi Standard Specifications for Construction Works. Specialized scientific journals in civil engineering.
b. Electronic References, Internet Sites ...	All scientific websites within the specialty of construction methods and estimation.

Course Description Form

1. Course Name	
English Language IV	
2. Course Code	
50601409	
3. Semester / Year	
2025-2026	
4. Date of Preparation of this Description	
5-4-2026	
5. Available Attendance Forms	
Weekly Lectures	
6. Total Study Hours (Overall) / Total Credit Units (Overall)	
60 hours / 2 units	
7. Course Coordinator Name (mention if more than one)	
Name: Email:	
8. Course Objectives:	
Course Subject Objectives	At the end of the course, students are expected to learn: In today's globalized and technology-driven world, effective communication in English is crucial for professionals in the technical field. This course is tailored to meet the unique language needs of students pursuing careers in engineering, technology, and other technical domains. The Technical English Course is structured to cover a diverse range of topics essential for teaching English in technical settings. The curriculum focuses on enhancing language proficiency while addressing the specific terminology and communication demands of the engineering technical field.

9. Teaching and Learning Strategies

Strategy

Technical Terminology: Develop a comprehensive understanding of technical vocabulary, jargon, and expressions commonly used in engineering and technology.

Learn effective strategies for teaching students how to communicate clearly and confidently in technical contexts.

6. Communication Skills: Explore various communication scenarios within the technical field, including technical writing, presentations, and collaborative projects.

Gain insights into teaching effective communication skills tailored to the needs of technical professionals.

7. Language Proficiency: Enhance language proficiency in reading, writing, listening, and speaking, with a focus on technical subjects. Learn how to facilitate language learning that aligns with the demands of technical professions.

8. Industry-specific Knowledge: Acquire foundational knowledge in technical subjects relevant to the course, enabling instructors to contextualize language instruction within the broader technical domain. Understand key concepts in engineering, technology, and related fields.

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit Name / Topic	Teaching Method	Assessment Method
1	2	Unit 1	Introduction to Construction Methods	theoretical	Tests & Reports
2	2				
3	2	Unit 2	Dimensions and Properties	theoretical	Assignments
4	2				
5	2	Unit 3	Comparative Data	theoretical	Quizzes
6	2				
7	2	Unit 4		theoretical	Reports

8	2		Impersonal scientific statements – The 5passive		
9	2	Unit 5	Exp6erimental Des7cription	theoretical	Assignments
10	2				
11	2	Unit 6	Cha8rts and Gr9aphs description	theoretical	Tests
12	2				
13+14	2	Review of Unit-1 to Unit-6			
15	2	Monthly Examination 1			
16	2	Unit 7	Linking Words	theoretical	Assignments
17	2				
18	2	Unit 8	Punctuation	theoretical	Reports
19	2				
20	2	Unit 9	Writing structured paragraph	theoretical	Tests
21	2				
22	2	Unit 10	Technical reports: Writing Introductions	theoretical	Assignments
23	2				
24	2	Unit 11	Laboratory reports	theoretical	Reports
25	2				
26	2	Unit 1	professional presentations	theoretical	Exams
27	2				
28	2	2 Review of Unit-7 to Unit-12			
29	2	Monthly Examination 2			
30	2	Final review of 12 units before finals			

11.Course Assessment

Distribut20ing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily quizzes, monthly exams, reports.... etc

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)

Recommended books and references (scientific

journals, reports...)