Course Description Form

1. Course Name:
Design of Steel structure
2. Course Code:
WCV-41-04
3. Semester / Year:
First semester / 2024-2025
4. Description Preparation Date:
28/09/2024
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
2/3
7. Course administrator's name (mention all, if more than one name)
Name: Dr.Salam Razaq Jasim Email: salam.razaq@uowa.edu.iq
8. Course Objectives

Course Objectives	• Understanding Steel as a Construction Material • Design Principles and Methodologies • Structural Components Design • Analysis of Steel Structures
9. Teaching and Learning Strategies	
Strategy	The strategy for designing steel structures encompasses a systematic approach to ensure struct safety, efficiency, and cost-effectiveness, while adhering to codes and standards. Here' structured strategy for the design of steel structures: • Define Design Requirements and Scope • Preliminary Design and Conceptual Planning • Structural Analysis • Detailed Structural Design • Use of Design Codes and Standards • Optimization of Design

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction Steel Structur	• Properties of structural steel (strength, ductility, weldability, etc.) • Advantages and disadvantages of using steel in construction • Types of structural steel and steel product	Thermotical	
2	3	Basics of Struct Analysis	Fundamental Principles of Structural Analysis Analysis Methods for Steel Structures		
3 4	3	Design Tension Members	Introduction to Tension Members		
5	3		Applications		
6		Mid exam			
7 8 9	3	Design of Compres Members (Columns)	Behavior of Compression Members Design of Steel Columns Applications		
10 11 12	3	Design of Beams	Flexural strength and shear strength		
13 14	3	Design of S Connections			
15	3	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)	Steel Design by Segui, Fourth Edition, 2007 Structural Steel Design by Mc Cormac and
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Csernak, Fifth Edition, 2012. 3- AISC-LF Manual. Handbook and Specifications
Electronic References, Websites	

Course Description Form

1. Course Name:
Design of Reinforced Concrete Structures I
2. Course Code:
WCV-41-06
3. Semester / Year:
First Semester / 2024-2025
4. Description Preparation Date:
23/09/2024
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Theoretical 45 hrs. Credits: 4
7. Course administrator's name (mention all, if more than one name)
Name: Waleed khaleel nayel--- PhD Email: waleed.k@uokerbala.edu.iq
8. Course Objectives

Course Objectives	1. Introducing students to the types of roofs used in different buildings. 2. Introducing students to calculating the minimum slab thickness of a concrete slab. 3. Direct Design Method. 4. Equivalent Frame Method. 5. Learn about the design and analysis of pre-stressed concrete members. 6. Using the theory of yield lines to analyze and design concrete slab.

9. Teaching and Learning Strategies

Strategy	Explaining the topics, and linking it to the practical reality of engineering projects, directing continuous questions to students for the purpose of continuing their participation, using electronic means to clarify various topics, conducting surprise and monthly written tests, and giving homework for each topic that is explained.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction	Introducing students to the different types of roofs and when to use each type Introduction	Attendance	Discussion
6-2	9	Minimum slab thickness to control deflection by using ACI-code	Minimum slab thickness to control deflection	Attendance	Exam
10-7	7	Direct Design Method	Direct Design Method	Attendance	Exam
11	9	Equivalent Frame Method	Equivalent Frame Method	Attendance	Exam
12	8	Yield Line Method	Yield Line Method	Attendance	Exam
15-13	9	Pre-stress concrete beam	Simple basic principles of pre-stressed concrete beam design	Attendance	Exam

11. Course Evaluation

Quizzes: 5%	Homework: 2.5 %	Class activity: 2.5%	1st Exam: 15%	2nd Exam: 15%	Final-Exam: 60%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	• Design of Reinforced Concrete Structures I and Design of Reinforced Concrete Structures II
Recommended books and references (scientific journals, reports…)	Building Code Requirements -ACI- for Structural Concrete (318-14,19)

Course Description Form

1. Course Name:	
Foundation Engineering II	
2. Course Code:	
WCV-42-01	
3. Semester / Year:	
Second Semester / 2024-2025	
4. Description Preparation Date:	
23/9/2024	
5. Available Attendance Forms:	
In-present	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Total tuition hours: 60 hrs/semesterTheory: 3 hrs/week Tut. : 1 hr/week Units: 3	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Hadeel Challoob Dekhn Email: hadeel.ch@uowa.edu.iq	
8. Course Objectives	
Course Objectives	• Chapter One:Pile Foundations • Chapter Two:Lateral Earth Pressure • Chapter Three:Retaining Wall • Chapter Four: Sheet Pile
9. Teaching and Learning Strategies	
Strategy	Preparation of practical engineers in the field of deep foundations and other structural members underground surface who are characterized by a high level of knowledge and technological innovation, and work in with internationally approved discreet standards of quality assurance and academic accreditation of corresponding engineering programs with a commitment to ethics of engineering career. Enable students to learn and understand the various applications for deep foundations and other structural members underground surface according to the aims of the course.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	4	Definition, Types of Piles and Their Structural Characteristics	Chapter One: Pile Foundations	Theoretical lectures, discussion and dialogue, brain storming, examples and questions used to achieve the goals	Daily exams, quizzes, documented examinations, quarterly exams, final exams, oral questions and discussions during the lectures, and home works
2	4	Estimating Pile Length, Point Bearing Piles, Friction Piles			
3	4	Methods of installation of piles, load transfer mechanism, point load and friction piles.			
4	4	Pile capacity: in cohesion less soil, in cohesive soil (alpha, beta, and lambda equations)			
5	4	Examples on item of third week, bearing capacity of pile in mixed soil (c-ϕ) Pile			
6	4	Pile capacity from in situ tests (SPT, load test). Negative skin friction			
7	4	Group of piles: capacity (two modes of failure: single and block) and efficiency			
8	4	continuous			
9	4	Settlement of pile group.			
10	4	Introduction to lateral earth pressure theory, active and passive lateral pressure by Rankine theory for horizontal surface.	Chapter Two: Lateral Earth Pressure		
11	4	Active and Passive lateral pressure by Rankine theory for inclined surface.			
12	4	Coulomb theory for active and passive lateral pressures.			
13	4	Definitions and types of retaining walls, geotechnical proportioning against overturning, sliding and base shear failure.	Chapter Three: Retaining Wall		
14	4	Analysis and design of retaining walls.			
15	4	Sheet piles: function and types, installation. Cantilever sheet pile.	Chapter Four: Sheet Pile		

11.Course Evaluation	
Daily exams, quizzes, documented examinations, quarterly exams, final exams, o questions and discussions during the lectures, and home works.	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Braja M. Das and Sivakugan N, (2019) Principles of Foundation Engineering, Ninth edition, SI edition.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Foundations Engineering 1st
2. Course Code:
3. Semester / Year:
First Semester 2023−2024
4. Description Preparation Date:
24\9\2024
5. Available Attendance Forms:
In person
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hrs (15 weeks and 4 hrs/week)
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Hadeel Challoob Dekhn Email: hadeel.ch@uowa.edu.iq
8. Course Objectives

Course Objectives	To learn about types and purposes of different foundation systems structures. To provide students with exposure to the systematic methods for designing foundations. To discuss and evaluate the feasibility of foundation solutions to different types of soil conditions considering the time e on soil behavior. To build the necessary theoretical background for design and construction of foundation systems.

9. Teaching and Learning Strategies

Strategy	Foundation engineering courses require effective learning and teaching strategies toensure students develop a strong understanding of complex concepts and their practical applications. The range of strategies that can enhance the learning experience for students in foundation engineering courses. These strategies include lecture-based teaching, practical applications, problem-solving assignments, group work and discussions, technology integration, field trips and site visits, guest speakers, assessments and feedback, continuous learning, and encouraging self-directed learning. By incorporating these strategies, educators can create an engaging and comprehensive learning environment that equips students with the knowledge, skills, and critical thinking abilities necessary for success in the field of foundation engineering.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	12	• Definition and aims • Steps • Number and depth of borin • Sampling • Laboratory tests • Field tests • Report	Site Investigation	Powerpoint presentations (Hand-out). Video for explana each lecture. Photos and videos more explanation	-Daily oral questions and quick written tests. -Discussion and with students. -Small projects -Attendance. -Monthly written tests. -Final exam.
4-9	24	•Introduction • Terzaghi's bearing capacity equation and BC factors • Meyerhof 's equation and shape factors • SPT used for BC • Eccentricity loading (one axes and bi-axes) • BC of non-homogeneous so • Uplift Capacity	Bearing capacity for shallow foundation		
10-15	24	Elastic Theory Immediate settlement Settlement Consideration Consolidation settlement Secondary settlement	Settlement for saturated soil		

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
15% Monthly Exam 1
15% Monthly Exam 2
10% Quizzes and participation
60% Final Exam

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	-DAS B. M., "Principles of Foundation Engineering", Seventh Edition, 2011. 5. -DAS B. M., "Principles of Geotechnical engineering" Seventh Edition, 2010. 6. -Bowles J. E. "Foundation Analysis and Design", F Edition, 2006.
Recommended books and references (scientific journals, reports…)	Huang A. B. and Yu H. S., "Foundation Engineering Analysis and Design" First Edition, 2018. 2. -Couto D. P., Kitch W. A., Yeung M. R., "Foundation design : principles and practices" Third Edition, 2016. -Briaud J. L., "Geotechnical Engineering: Unsaturated Saturated Soils" First Edition, 2013.
Electronic References, Websites	-Videos by YouTube or any other sources relating to the course. -Websites on the WWW for furnishing more explanation the themes of this course.

Course Description Form

1. Course Name:
Highway Engineering/ 4th
2. Course Code:
WCV−41−03
3. Semester / Year:
2023-2024 (Semester System)
4. Description Preparation Date:
22/09/2024
5. Available Attendance Forms:
By person
6. Number of Credit Hours (Total) / Number of Units (Total):
30 hrs. (theoretical) + 30 hrs. (practical)
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Prof Dr. Anmar Falih Diekan Email: a.f.dulaimi@uowa.edu.iq
8. Course Objectives

Course Objectives	a) Familiarity with the development of road construction. b) Study of site and alignment of roads. c) Introducing students to the technical details of highway engineering and its types. d) Understanding the materials used in road construction. e) Describing the structure and function of the road. f) Study of asphalt and concrete road layers. g) Study of flexible and concrete road design. h) Familiarizing students with road defects and their treatment. i) Course outcomes and teaching, learning, and assessment methods.

9. Teaching and Learning Strategies

Strategy	1. Providing a comprehensive introduction to each study to and connecting the current topic to previous ones.

	2. Delivering theoretical lectures. 3. Presenting short scientific films. 4. Providing and explaining sufficient examples. 5. Conducting experiments in the road laboratory. 6. Using brainstorming to convey the material.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2 2-6 6-10 10-15 15-20 20-25 25-30	6 24 24 30 30 30 30	**Cognitive goals: the student has to be able to:** 1. Demonstrating the understanding of the need for the development of highway engineering. 2. Identifying the soil behavior beneath road structures. 3. Determining the fundamental behavior of materials used in roads. 4. Identifying the main methods for designing asphalt mixtures. 5. Identifying the main methods for designing road layers. 6. Clarifying the details of r failure and appl road maintenance **Acquired skills from the course** 1. Understanding the layers of the asphalt and concrete road structure. 2. Designing asphalt concrete mixtures for road	Road Construction Development Pavement Structures Highway Location - Highway Alignment Requirements of the Highway Alignment Factors controlling alignment Survey and Plans Available Techniques of survey EARTHWORKS AND MASS-HAUL DIAGRAM Determining the Earthwork Volumes The Mass-Haul Diagram Pavement Materials Flexible Pavement Layers Rigid Pavement Layers Bituminous Material (Bitumen Bituminous Mixes Types of Asphalt Mixes Aggregate Combination and Separation to Meet Job mix Load Carrying Mechanism Bituminous Mixture Technologies Requirements for a Bituminous Mixes Design of Bituminous Mixe Rigid Pavement reinforcement and joints Reinforcing Steel Joints in concrete pavements Types of rigid high pavements Design of highway pavement Design Approaches Pavement Types and Materials	1. Providing a comprehensive introduction to each study topic and connecting the current topic to previous ones. 2. Delivering theoretical lectures. 3. Presenting short scientific films. 4. Providing and explaining sufficient examples. 5. Conducting experiments in the road laboratory. 6. Using brainstorm to convey the mater	1. Participation within the classroom. 2. Short written tests. 3. Discussion and dialogue with students. 4. Assigning homework at the end of each topic. 5. Presenting posters about some road problems and their solutions. 6. Attendance. 7. Monthly written exams. 8. Final seme exam.

			Thickness Design of Flexible Pavements AASHTO Thickness Desig Rigid Highway Pavements		

11. Course Evaluation

1. Participation within the classroom 2%.
2. Short written tests 3%.
3. Assigning homework at the end of each topic 5%.
4. Attendance 5%.
5. Monthly written exams 35%.
6. Final semester exam 50%.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Traffic and Highway Engineering, Nicholas Garber & Lester A. Houel (4 Edition 2010)
Main references (sources)	Principles of Pavement Engineering, by Nicholas Thom (2nd Edition 2014). Highway engineering, by P. H. Write & K.K. Dixon, 7th edition Highway engineering, by Olgesby & Hicks Highways, The Location, Design, Construction and Maintenance of Road Pavements. By Coleman O'Flaherty (4th Edition 2009) . General specification for road and bridge, by Ministry of housing and construction (revised edition, 2003) AASHTO Guide for Design of Pavement Structures, by AASHTO (1993), American Association of State Highway and Transportation Officials, Washington, D.C. Principles of Pavement Engineering, by Nicholas Thom (2nd Edition 2014). Highway engineering, by P. H. Write & K.K. Dixon, 7th edition Highway engineering, by Olgesby & Hicks Highways, The Location, Design, Construction and Maintenance of Road Pavements. By Coleman O'Flaherty (4th Edition 2009) . General specification for road and bridge, by Ministry of housing and construction (revised edition, 2003) AASHTO Guide for Design of Pavement Structures, by AASI (1993), American Association of State Highway and Transporta Officials, Washington, D.C.
Recommended books and references (scientific journals, reports…)	Construction and Building Materi Journal https://pavementinteractive.org
Electronic References, Websites	https://www.highwaysmagazine.co.uk/

UNIVERSITY OF WARITH AL-ANBIYAA
COLLEGE OF ENGINEERING
2017
كلية الهندسة

Course Description Template

1. **Module Name:**	
Hydraulic Structures I	
2. **Module Code:**	
WCV−41−07	
3. **Semester / Year:**	
FIRST semester / 2024-2025	
4. **Date of Preparation of this Description:**	
15/9/2024	
5. **Available Attendance Formats:**	
In-person only	
6. **Total Credit Hours / Total Units:** Total units 2	
Total hours 48 (30 theoretical + 15 practical)	
7. Name of the Course Coordinator (if there are multiple names):	
Assist lecturer Wurood Hussein Qhban Email: wurood.hussien@uowa.ed.iq	
8. Module Objectives:	
• Identify and understand the basic terms and concepts related to hydraulics and hydraulic structures, such as pressure and discharge, etc. • Understand the process of designing and constructing hydraulic structures, including material selection, dimensions, capacities, and determining suitable locations for hydraulic projects. • Evaluate the performance of hydraulic structures and examine the factors that may affect their efficiency and sustainability. • Assess the costs and benefits of hydraulic projects and examine the economic aspects of their implementation. • Develop the ability to think analytically and solve problems related to hydraulics and hydraulic structures. • Achieving these objectives contributes to qualifying students or professionals to understand and apply the principles and techniques of	**Module Objectives**

hydraulics in practical projects.	

9. Teaching and Learning Strategy

Presentations **Paper lectures and scientific resources** **Practical lectures at work sites**	**Strategy:**

10. Module Structure

Assessment Method	Learning Method	Unit or Topic Name	Required Learning Outcomes	Hours	Week
Exams Assignments Reports Exams + Participation	In-person	Hydraulic Structures	Introduction to Hydraulic Structures	2	2-1
			Seepage under Hydraulic Structures -Bligh's Creep Theory -Lane's Weighted Creep Theory -Khosla's Theory -thickness of floor-	8	7-3
			The Regulators -Type of regulator -The hydraulic design of regulator	4	9-7
			Hydraulic Jump	2	10
			Drop structure -Vertical drop -Inclined drop -Piped drop	4	12-10
			Stilling Basins -Advantages, Froud , Types	4	14-12
			Protection of approaches for concrete floors -Downstream Protection. -up stream Protection.	4	16-14

11. Module Evaluation

10 points (Daily preparation, daily and oral exams, homework, and classroom activities)
30 points (Monthly exams)
60 points (Final exam)

12. Learning and Teaching Resources.

San Tosh, Kumar Garg,1998: Irrigation Engineering and Hydraulic Structures.	Required Textbooks (if applicable)

Course Description

Chow.V.T.1960: Open Channel Hydraulic. Mcgraw-Hill, New York	Main References (Sources)
	Recommended Supporting Books and References (current journals, reports, etc.)
	Electronic References, Websites

1. Course Name:	
Hydraulic Structures II	
2. Course Code:	
WCV-42-07	
3. Semester / Year:	
Second Semester 2024/-2025	
4. Description Preparation Date:	
20/Mar/2024	
5. Available Attendance Forms:	
In presence	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Number of hours: 45 hr (30 hr theoretical, 15 hr Tutorial) Number of units: 2 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Safa'a Sabry Mohammed Email: safaa.sabry@uowa.edu.iq	
8. Course Objectives	
Course Objectives	• Identify and understand basic terms and concepts related to hydraulics and hydraulic installations, such as pressure, discharge etc... • Understand the design and construction process of hydraulic facilities, including selecting materials, dimensions, capacities, and determining appropriate locations for hydraulic projects. • Evaluate the performance of hydraulic installations and examine factors that may affect efficiency and sustainability. • Evaluate the cost and benefits of hydraulic projects, and examine the economic aspects of their implementation. • Develop the ability to think analytically and solve problems related to hydraulics and hydraulic installations. • Achieving these goals contributes to qualifying students or professionals to understand and apply hydraulics principles and techniques in practical projects.

9. Teaching and Learning Strategies

Strategy	• Presentations • Paper lectures and scientific sources • Practical lectures at work sites

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
2-1	6	Hydraulic Jump	Hydraulic structures	Presence	Exams + participation + attendance
3	3	Vertical Drops & Chutes	Hydraulic structures	Presence	Exams + participation + attendance
5-4	6	Stilling Basins	Hydraulic structures	Presence	Exams + participation + attendance
7-6	6	Protection Of Approaches for Horizontal Floor	Hydraulic structures	Presence	Exams + participation + attendance
9-8	6	Box Culverts	Hydraulic structures	Presence	Exams + participation + attendance
11-10	6	Aqueduct Structures	Hydraulic structures	Presence	Exams + participation + attendance
13-12	6	Inverted Siphon	Hydraulic structures	Presence	Exams + participation + attendance
15-14	6	Design Of Gates	Hydraulic structures	Presence	Exams + participation + attendance

11.Course Evaluation

10 marks (daily preparation, daily and oral exams, homework, and classroom activities)
30 marks (monthly exams)
60 marks (final exam)

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	San Tosh, Kumar Garg,1998: Irrigation Engineering and Hydraulic Structures.
Main references (sources)	Chow.V.T.1960: Open Channel Hydraulic. Mcgraw-Hill, New York
Recommended books and references (scientific journals, reports...)	-
Electronic References, Websites	-

Course Description Form

1. Course Name:
Hydrology I
2. Course Code:
WCV-41-05
3. Semester / Year:
First semester/ 2024-2025
Description Preparation Date:
23/9/2024
4. Available Attendance Forms:
Lectures are in person at the university only
5. Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total) 3 / Number of Units (Total) 2
6. Course administrator's name (mention all, if more than one name)
Name: Asst. Lect. Zahraa Kareem Kadhim Email: zahraa.kareem@uowa.edu.iq
7. Course Objectives

Course Objectives	• Introduce and learn about the movement of water in nature • The hydrological cycle and its components • Rain, storms and formation methods • Rainfall measurement methods and monitoring stations and their spatial distribution • Measurement of evaporation from water surfaces • Bio evapotranspiration of forest and living organisms • Infiltration process and base flow formation • Surface runoff formation and its equations • Methods for measuring surface runoff • Follow the flood wave routing • Ground water hydrology

8. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering a type of simple experiments involving some sampling at homework section.

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
16	3	1. What are the rains and how does it affect public life 2. How to calculate the amount of rain expected	1. Introduction: Definition of hydrology, Engineering hydrology; Hydrologic cycle and its elements; Water budget concept, world water	Lectures are in person at the university only	(exam1 = 15), (exam2 = 15) (Quizzes = 4%), (Activities= 4%), (Attendance=2%) (Final exam = 60%)

		from a rainstorm 3. Methods of measuring the diameters of the network planned to deal with the amount of rainfall 4. Flood wave movement and routing its track 5. Ground water formation 6. Removing ground water from site work	budget; Applications of hydrology in engineering. 2. Weather and Hydrology: Definition of climate and weather; Solar and earth radiation, measurements, thermal circulation; Temperature, measurements, terminology; Humidity, measurements, vapor pressure, latent heat; Wind, measurements of speed and direction. 3. Precipitation: Definition of precipitation and its occurrence; Forms of condensation and precipitation; Types of precipitation; Measurements, rain gage networks, density, and adequacy; Preparation of data, missing data, test of consistency records; Average precipitation over area; Analysis of rainfall data, IDF relationship, Hydrograph. 4. Evaporation: Definition of evaporation and evapotranspiration; Estimation of evaporation (analytical solution — water budget, energy budget), Dalton equation; Empirical equations, Thornthwaite and Penman formula; Estimation of reservoir evaporation, Pan evaporation and Pan coefficient. 5. Abstraction losses: Infiltration and infiltration losses; infiltration index φ and W- index. 6. Stream flow: Stream gage, manual, automatic and recorded gages; Estimation of stream discharge, direct and indirect measurements; Current meter, Calculation of discharge using area-velocity methods; Stage discharge relationship; Permanent and shifting control stages. 7. Runoff: Direct runoff and base flow; Water year; Runoff volume; Rainfall-runoff correlation; Flow mass curve; droughts.		

10. Course Evaluation

(exam1 = 15),
(exam2 = 15),
(Quizzes = 4%),

(Activities= 4%), (Attendance=2%), (Final exam = 60%)	
11. Learning and Teaching Resources	
Main references (sources)	1. K. Subramanya, 2009 Engineering Hydrology.
	2. Bedient P B Huber, W C And Vieux, B E 2008 Hydrology And Floodplain Analysis.
	3. Gupta, R.S., 2016 Hydrology And Hydraulic Systems.

Course Description Form

1. Course Name:
Hydrology
2. Course Code:
Hydrology II
3. Semester / Year:
2023-2024 (Semester System)
4. Description Preparation Date:
1/10/2023
5. Available Attendance Forms:
Theory
6. Number of Credit Hours (Total) / Number of Units (Total)
45 hours (2 theoretical + 1 applied)/4 units
7. Course administrator's name (mention all, if more than one name)
Name: Ghaida Najim Hanish Email: ghaida.najim@uowa.edu.iq
8. Course Objectives

Course Objectives: Understand the behavior fluids when at rest or flowing through a syst (statics and the student's ability to recognize general principles of water science (hydrology) describing the state of formation, distribution transfer of water in its three forms (liquid, solid gaseous) in all parts of the biosphere within hydrological cycle. The curriculum also inclu modern methods of clarifying and describing e element of the hydrological cycle and perform calculations. It is necessary to estimate and exp the environmental factors affecting each elemen the cycle. The curriculum also included comprehensive explanation of the most import practical methods for measuring the hydrolog properties of surface water, along with	**A. Cognitive goals: the student has to be able to** **1. Identify the foundations of water science (hydrology).** **2. Identify the formation, distribution and transp of water in all environments within the hydrologi cycle.** **3. Identify the theoretical and practical foundatio of hydrological measurements for each element the hydrological cycle.** **4. Knowledge of the environmental conditions affecting the elements of the hydrological cycle.** **5. Identify the water budget for surface groundwater.** **B. Acquired skills from the course**

explanation of the special computational meth for estimating them.	**1. Acquiring the skill of performing mathemat calculations to estimate the hydrological conditi for each element of the hydrological cycle.** **2. Acquiring the skill of planning and designing locations of measuring stations for hydrolog elements, such as the possibility of knowing optimal number of stations to measure the amo of rain in a specific area and distributing them in accurate scientific manner within the required ar**

9. Teaching and Learning Strategies

Strategy	1. The student acquires important information about hydrology. 2. The student's knowledge of the relationship of the topics of this subject with other subjects. 3. The student's knowledge of the applied aspects of the subject topics. 4. The student acquires knowledge of using different sources for subject topics.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
16-19	12	1. Characteristics of the Hydrograph 2. Stream Flow Recession 3. Hydrograph Separation 4. Hydrograph Synthesis 4. The Unit Hydrograph 5. Derivation of Unit Hydrograph 6. The Conversion of U-H Duration 7. Synthetic UH	HYDROGRAPHS	1. Lectures and illustrations: Data Show. 2. Multimedia using the e-learning system. 3. Delivering a lecture, answering students' questions, and discussing with students aspects that are not clear to them.	1. Daily oral questions 2. Discussion an dialogue with students. 3. Attendance. 4. Bi-monthly or exams. 5. Monthly writt tests. 6. A final annual exam.
20-21	6	1. Routing in Reservoir 2. Routing in River Chan	FLOOD ROUTING		
22-24	9	1. Movement of Groundwater 2. Discharge of Groundwater 3. The Wells 4. Equilibrium Hydraulics of Wells (steady flow)	GROUNDWATER (Subsurface Water)		

		5. No equilibrium Hydrau of Wells (unsteady flow)			
25-27	9	1. Chow Method Solution 2. Recovery Test 3. Unsteady Radial Flow in an Unconfined Aquifer 4. Unsteady Radial Flow Leaky Aquifer	GROUNDWATER (Subsurface Water)		
28-30	9	1. Well Flow Near Aquifer Boundaries 2. Well Flow Near a Stream 3. Well Flow Near an Impermeable Boundary 4. Well Losses	GROUNDWATER (Subsurface Water)		

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)	• Bedient P B Huber, W C and Vieux, B E 2008 Hydrology and Floodplain Analysis. • Gupta, R.S., 2016 Hydrology and hydraulic systems. • K. Subramanya, 2009 Engineering Hydrology.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Highway Engineering	
2. Course Code:	
WCV-42-03	
3. Semester / Year:	
Second semester /2024-2025	
4. Description Preparation Date:	
23 / 9 / 2024	
5. Available Attendance Forms:	
Students that are interested in learning	
6. Number of Credit Hours (Total) / Number of Units (Total)	
4 hours per week / number of units (3 units)	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Prof Dr. Anmar Falih Diekan Email: a.f.dulaimi@uowa.edu.iq	
8. Course Objectives	
Course Objectives	1. Familiarity with the development of road construction. 2. Study of site and alignment of roads. 3. Introducing students to the technical details of highway engineering and its types. 4. Understanding the materials used in road construction. 5. Describing the structure and function of the road. 6. Study of asphalt and concrete road layers. 7. Study of flexible and concrete road design. 8. Familiarizing students with road defects and their treatment. 9. Course outcomes and teaching, learning, and assessment methods.
9. Teaching and Learning Strategies	
Strategy	1. Providing a comprehensive introduction to each study topic and connecting the current topic to previous ones . 2. Delivering theoretical lectures . 2 3. Presenting short scientific films .

	4. Providing and explaining sufficient examples. 5. Conducting experiments in the road laboratory. 6. Using brainstorming to convey the material

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2 2-6 6-10 10-15 15-20 20-25 25-30	6 24 24 30 30 30 30	Cognitive objectives 1- Demonstrate understanding of the need for highway engineering development. 2- Identify the behavior of soil under road structures. 3- Identify the basic behavior of materials used in roads. 4- Identify the main means of designing asphalt mixtures. 5- Identify the main means of designing road layers. Explain the details of road failure and the application of road maintenance B-Skill objectives of the course 1- Know the layers of asphalt and concrete road structure. Design of asphalt and concrete mixtures for roads.	Road Construction Development Pavement Structures Highway Location - Highway Alignment Requirements of the Highway Alignment Factors controlling alignment Survey and Plans Available Techniques of survey EARTHWORKS AND MASS-HAUL DIAGRAM Determining the Earthwork Volumes The Mass-Haul Diagram Pavement Materials Flexible Pavement Layers Rigid Pavement Layers Bituminous Material (Bitumen Bituminous Mixes Types of Asphalt Mixes Aggregate Combination and Separation to Meet Job mix Load Carrying Mechanism Bituminous Mixture Technologies Requirements for a Bituminous Mixes Design of Bituminous Mixes Rigid Pavement reinforcement and joints Reinforcing Steel Joints in concrete pavements Types of rigid highway pavement Design of highway pavement Design Approaches Pavement Types and Materials Thickness Design of Flexible Pavements AASHTO Thickness Design for Rigid Highway Pavements	1. Providing a comprehensive introduction to each study topic and connecting the current topic to previous ones . 2. Delivering theoretical lectures . 3. Presenting short scientific films . 4. Providing and explaining sufficient examples . 5. Conducting experiments in the road laboratory . 6. Using brainstorming to convey the material. .	1. Participation within the classroom. 2. Short written tests. 3. Discussion and dialogue with students . 4. Assigning homework at the end of each topic. 5. Presenting posters about some road problems and their solutions . 6. Attendance . 7. Monthly written exams. 8. Final semester exam.

10. Course Evaluation

1. Participation within the classroom 2%.
2. Short written tests 3%.
3. Assigning homework at the end of each topic 5%.
4. Attendance 5%.
5. Monthly written exams 35%.
6. Final semester exam 50%.

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Traffic and Highway Engineering, by Nicholas Garber & Lester A. Houel (4th Edition 2010)
Main references (sources)	Principles of Pavement Engineering, by Nicholas Thom (2nd Edition 2014) . Highway engineering, by P. H. Write & K.K. Dixon, 7th edition Highway engineering, by Olgesby & Hicks Highways, The Location, Design, Construction and Maintenance of Road Pavements. By Coleman O'Flaherty (4th Edition 2009) . General specification for road and bridge, by Ministry of housing and construction (revised edition, 2003) AASHTO Guide for Design of Pavement Structures, by AASHTO (1993), American Association of State Highway and Transportation Officials, Washington, D.C. Principles of Pavement Engineering, by Nicholas Thom (2nd Edition 2014) . Highway engineering, by P. H. Write & K.K. Dixon, 7th edition Highway engineering, by Olgesby & Hicks Highways, The Location, Design, Construction and Maintenance of Road Pavements. By Coleman O'Flaherty (4th Edition 2009) . General specification for road and bridge, by Ministry of housing and construction (revised edition, 2003) AASHTO Guide for Design of Pavement Structures, by AASHTO (1993), American Association of State Highway and Transportation Officials, Washington, D.C .
Recommended books and references (scientific journals, reports…)	Construction and Building Materials Journal https://pavementinteractive.org
Electronic References, Websites	https://www.highwaysmagazine.co.uk/

Course Description Form

1. Course Name:	
Method of Construction and Estimation	
2. Course Code:	
WCV-42-08	
3. Semester / Year:	
Second semester /2024-2025	
4. Description Preparation Date:	
23 / 9 / 2024	
5. Available Attendance Forms:	
Students that are interested in learning	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours per week / number of units (2 units)	
7. Course administrator's name (mention all, if more than one name)	
Name: assist lecturer Ghadeer Haitham Hassan mailto:ghadeer.haitham@uowa.edu.iq	
8. Course Objectives	
Course Objectives	1. Understanding of cost and its types. 2. Illustrating funding requirements. 3. Understand construction phases and project life cycle. 4. Learning planning sciences in construction industry. 5. Familiarize students to basic concepts of construction equipment's productivity. 6. To understand resource allocation and how pre-plan labor requirements scheduling. 7. To prepare construction projects' Bill of quantities. 8. Definition general conditions for works of civil engineering.
9. Teaching and Learning Strategies	
Strategy	1. Providing a comprehensive introduction to each study topic and connecting the current topic to previous ones . 2. Delivering theoretical lectures 3. Presenting short scientific films . 4. Providing and explaining sufficient examples.

	5. Conducting experiments in the road laboratory. 6. Using brainstorming to convey the material

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2 2-6 6-10 10-15 15-20 20-25 25-30	6 24 24 30 30 30 30		Introduction Construction equipment The cost of owning and operating construction equipment Engineering fundamentals Earth work equipment Soil stabilization and compaction Equipment for production and transportation of concrete Forms for concrete structures Calculation of construction materials quantity Quantities of construction materials Calculation of the steel reinforcement quantity in concrete Bill of quantities, and calculating of construction works	1. Providing a comprehensive introduction to each study topic and connecting the current topic to previous ones . 2. Delivering theoretical lectures . 3. Presenting short scientific films . 4. Providing and explaining sufficient examples .	1. Participation within the classroom. 2. Short written tests. 3. Discussion and dialogue with students . 4. Assigning homework at the end of each topic. 5. Presenting posters about some road problems and their solutions . 6. Attendance . 7. Monthly written exams. 8. Final semester exam.

10. Course Evaluation

1. Participation within the classroom 2%. 2. Short written tests 3%. 3. Assigning homework at the end of each topic 5%. 4. Attendance 5%. 5. Monthly written exams 35%. 6. Final semester exam 50%.

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Guessing - Medhat Fadil - University of Baghdad Construction Planning, Equipment , and Methods (L. Peurifoy) Estimating in Building Construction (J. Peterson and R. Dagostion) Estimating and tendering for construction work (Martin Brook)
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Method of Construction and Estimation
2. Course Code:
WCV−41−08
3. Semester / Year:
2023-2024
4. Description Preparation Date:
19/3/2024
5. Available Attendance Forms:
In present
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hrs. (theoretical)
7. Course administrator's name (mention all, if more than one name)
Name: assist lecturer Ghadeer Haitham Hasan Email: ghadeer.haitham@uowa.edu.iq
8. Course Objectives

Course Objectives	• **Understand the different types of fluid flow.** • **Differentiate between the governing equations of flow and their applications.** • **Understand the difference between the statics and dynamics of fluids.** • **Understand the differences of fluid pressure and its measurements,** • **Calculate the forces exerted by fluids motion.**

9. Teaching and Learning Strategies	
Strategy	**Strategies that be adopted to deliver the module is by encourage students' participation to accomplish the exercises.** **Also, refining and expanding critical thinking skills for the students.** **This will be achieved through classes, interactive tutorials, and considering type of simple experiments involving some sampling activities that interest the students.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	1. Punctuality. 2. Pay attention to the lecturer during class and write down the information provided. 3. To be calm and respectful during classes and answe questions in a scientific manner. To understand t importance of fluid mechanics and the impac of the subject on his futu career in this field.	1. Introduction	1 Giving the lecture, answering students' questions, and discussing with the students aspects that are not clear to them 2. Data Show lectures and illustrations Practical tests and experiments using laboratory equipment 3. Multimedia Use of the education syste Electronic	1. Initial evaluation adopting the metho of participation in th lecture 2. Continuous evaluation by conducting a set of exams with multiple options 3. Diagnostic evaluation through conducting schedul tests at specific time and assigning stude to perform specializ projects. 4. Final evaluation
2-3	6		2. Construction equipmer		
4-6	12		3. The cost of owning an operating construction equipment		
7-8	18		Engineering fundamentals 4. Earth work equipment		
9-12	21		5. Soil stabilization and compaction		
13-14	24		6. Equipment for product and transportation of concrete		
15	27		7. Forms for concrete structures		
16-17	30		8. Calculation of construction materials quantity		
18-21	33		9. Quantities of construct materials		

2-23	36		10. Calculation of the stee reinforcement quantity concrete		
2- 2	39		11. Bill of quantities, and calculating of construction works		

11. Course Evaluation

1. Oral examination during daily lessons.
2. Joins discussions during lectures.
3. Monthly checks.
4. Mid-year exams.
5. Final years exams.

12. Learning and Teaching Resources

Prescribed books required (textbook)	Guessing - Medhat Fadil - University of Baghdad
Main references	Construction Planning, Equipment , and Methods (L. Peurifoy) Estimating in Building Construction (J. Peterson and R. Dagostion) Estimating and tendering for construction work (Martin Brook)
Web sites and electronic references.	

UNIVERSITY OF WARITH AL-ANBIYAA
COLLEGE OF ENGINEERING
2017
كليـــة الهندســـــة

Course Description Form

1. Course Name:	
Sanitary & Environmental Engineering II	
2. Course Code:	
WCV-42-02	
3. Semester / Year:	
Second semester /2024-2025	
4. Description Preparation Date:	
23 / 9 / 2024	
5. Available Attendance Forms:	
Students that are interested in learning	
6. Number of Credit Hours (Total) / Number of Units (Total)	
1. Theoretical Time: 2Hrs/Week / Total: 60Hrs. 2. Lab. Time: 2Hrs / Week / Total: 60Hrs. 3. Tutorial Time: 1Hour / Week / Total: 30Hrs number of units (3 units)	
7. Course administrator's name (mention all, if more than one name)	
Name: Safa'a Sabry Mohammed Email: safaa.sabry@uowa.edu.iq	
8. Course Objectives	
Course Objectives	The Course Objectives are to help 1. Knowing a general Introduction about the Sanitary Engineering. 2. Knowing how to estimate the quantity of water during the design of any waterworks project, and what is necessary to estimate the amount of water, determining the number of people who will be served and their per capita water consumption. 3. The quality of water supplies and their requirements for multi uses of water. 4. Take a look on the water distribution systems in general form ……. 5. Knowing the description of intakes, the general requirements for the location of intakes and design criteria of intake structures. Besides, several types of intakes and the screens. The general requirements for the location and the design criteria of screens. 6. Studying the pumps and pumping stations., the general requirements for the design of pumps and pumping stations. Besides, several types of pumps. 7. Knowing the nature of Coagulation and Flocculation in water, its reasons and removal requirements. 8. Looking for the description of the water clarification (sedimentation) process, the general requirements for the design of the sedimentation

	tank. Besides, the sedimentation theory, the design criteria and the types of sedimentation tanks. 9. Knowing the basic information regarding water filtration process, the general requirements for the design of the filtration unit, the types of filters according to process workability and media. Besides, the design criteria of filtration unit. 10. Knowing all information about the water disinfection, its method, ….etc. 11. Studying the Special treatments of Hardness Removal or Water Softening. 12. Take a general look on introduction to wastewater or sewage, definitions to main terms used with wastewater engineering, the main parts of wastewater collection system and the types of wastewater flowing in the sewer system. Besides, the characteristics of wastewater and the determination of organic matters. 13. Studying all about the quantity of wastewater. 14. Provided by the essential information regarding sewer systems, the components of sewer systems, sewer type and sewer materials. In addition, the flow in sewer systems and the design criteria of sewer network. 15. Obtaining the Appurtenances of the sewer
16. Teaching and Learning Strategies	
Strategy	1. Classic theoretical classes. 2. Practical classes and experimental measurements using laboratory equipment. E-learning. 3. Discussion and responding to students' questions.

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	1. Understanding environmental issues relevant to civil engineering-related activities. 2. Reinforcing the implications of	General concepts of Sanitary & Environmental Engineering	In class	1. Oral examination during daily classes. 2. Joined discussions during lectures.
2	5		Depreciation water	In class	

3	5	processes such as construction within a natural system. 3. Familiarity with preventive and management strategies to combat water, soil, air, and noise pollution. 4. Identifying concepts of water pollution control mechanisms and their impact on	**Expectation population:** Ways and the factors affecting the Expectation population	In class	3. Attendance. 4. Monthly examinations. 5. Mid-year examinations. 6. Final-Year examinations.
4	5		Calculate the required amount of water for fire fighting	In class	
5	5		Types of pipes, valves and accessories	In class	
6	5		Types of systems used in water distribution	In class	

11.Course Evaluation

The score of this material is as follows:
1. (50 of 100) degrees will be divided unequally between the daily attendance, daily preparation, daily oral, monthly examinations, solving problems as H.W., and the reports related to lab. Tests.
(50 of 100) degrees for the final examination.

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Steel, E.W. and McGhee, T.J., 1979. Water supply and sewerage (5th edition). New York: McGraw-Hill. Baruth, E.E. and American Water Works Association, 2005. Water treatment plant design.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Davis, M.L., 2010. Water and wastewater engineering. McGraw-Hill.

Course Description Form

1. Course Name:
Sanitary and Environmental Engineering I
2. Course Code:
WCV-41-02
3. Semester / Year:
First Semester / 2024 - 2025
4. Description Preparation Date:
1 September 2024
5. Available Attendance Forms:
Presence
6. Number of Credit Hours (Total) / Number of Units (Total)
Number of hours: 75 hours (30 hours theoretical, 15 hours tutorial, and 30 hours practical) Number of units: 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Lec. Safaa Sabry Mohammed **Email: Safaa.sabry@uowa.edu.iq**
8. Course Objectives

Course Objectives	• **Understand the Fundamentals of Water Supply Systems** • **Analyze Water Quality Parameters** • **Design Water Supply Systems** • **Apply Water Treatment Techniques** • **Evaluate Water Demand and Consumption**

	• **Implement Sustainable Water Management Practices**

9. Teaching and Learning Strategies

Strategy	• **Interactive Lectures and Discussions** • **Practical Labs and Field Visits** • **Project-Based Learning and Case Studies**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	12	**Quantity of water**	**Sanitary and Environmental Engineering I**	**Presence**	**Exams Participation Attendance**
3-6	12	**Collection and distribution of water**			
6-7	4	**Intakes**			
7-9	4	**Pump and pumping stations**			
9-10	4	**Quality of water supply**			
11-15	20	**Treatment of water**			

11. Course Evaluation

10 marks (daily preparation, daily and oral exams, homework, and classroom activities)
10 marks (Practical aspect: Reporting, discussion and exams)
30 marks (monthly exams)
50 marks (final exam)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Steel, E.W. and McGhee, T.J., 1979. Water supply and sewerage (5th edition). New York: McGraw-Hill.**
Main references (sources)	**Baruth, E.E. and American Water Works Association, 2005. Water treatment plant design.**
Recommended books and references (scientific journals, reports...)	**Metcalf, I.N.C., 2003. Wastewater engineering; treatment and reuse. McGrawHill.**

Electronic References, Websites	**Davis, M.L., 2010. Water and wastewater engineering. McGraw-Hill.**

Course Description Form

1. Course Name:

Steel structure/ 2nd

2. Course Code:

Steel structure/ 2nd

3. Semester / Year:

(Course System)/2023-2024

4. Description Preparation Date:

20/3/2024

5. Available Attendance Forms:

Theoretical Classes

6. Number of Credit Hours (Total) / Number of Units (Total)

60 hrs./2

7. Course administrator's name (mention all, if more than one name)

Name: Asst. Lect. Tabarak hussein
Email: tabarak.hu@uowa.edu.iq

8. Course Objectives

Course Objectives	• **Introducing students to the basic principles of steel structure designs in civil engineering** • **Introducing students to the applications of steel structures in practice** • **The basics that are adopted in the analysis and design of the structural members of the steel structure** • **Identify the analysis and design of members exposed to tensile, compressive, bending and shear forces, as well as types of connection……**

9. Teaching and Learning Strategies

Strategy	• **Design and analysis of members exposed to tensile forces of steel sections and manufactured** • **Design and analysis of the members exposed to the compression forces (columns) of the steel sections of the processed and manufactured and as well as the design of the steel base for columns** • **Design and analysis of beams exposed to bending and shearing forces of the rigid steel sections** • **Design and analysis of beams and columns exposed to dual-bending, tensile** **or compressive forces of the steel sections** • **Design and analysis of types of fastening for steel sections (bonding using welding and bolts)** • **Knowing all the steel sections, their applications and specificatio**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
6-19	16	design of beam for moments, shear and deflection	Introduction, plastic behavior (zone1), beam weight estimates, design of beams -zone 1(full plastic moment), lateral supports of beams Inelastic buckling (zone 2), bending coefficients, moment capacities (zone2). Design of beams-zone3, elastic buckling (zone3), AISC Beam design charts, noncompact sections design for shear deflections, unsymmetrical bending, and design of purlins	Theoretical and analytical	
20-24	20	Bending and axial compression (beam-columns	Design of base plates for concentrically loaded columns, Bending and axial compression.		

			Beam Columns, first order and second order moments, analysis. effective length, approximate second order analysis method . magnification factors, moment modification factors, design of beam- columns in braced frames. design of be columns unbraced fran AISC-Part6 Tab and equivalent a load method.		
25-26	8	**Bolted connection**	joints, pretension joints, slip-critical joints, fully pretensioning methods, bearing type connections, slip-resistance connections shear strength and bearing strength for bearing type connections (load pass through center of gravity of connection). strength for critical connect (load pass thro center of gravit connection), s of bolt holes, l transfer, lap jo butt joint, failur bolted joints, minimum maximum		
27-28	8	**Eccentrically loaded bolted connections**	Bolts subjected to eccentric shear, Elastic analysis method, reduced eccentricity method, instantaneous center of rotation method AISC-Part7 Tab bearing-type connections subjected to sh and tension, critical connect subjected to sh and tension.		
29-30	8	**Welded connections**	Welding advantages, types of welding.		

			classification of welds, type of weld, type of joints, fillet welds, plug and slot welds, welding symbols, strength of welds, AISC requirements, size and length limitations of fillet welds, design of simple fillet welds, 8 strength of fillet welds loaded transversely, design of wel connections v both longituc and transverse f welds, design fillet welds for t members, stren of plug and welds.		

11. Course Evaluation

- **Oral examination during daily classes. (4/100)**
- **Joined discussions during lectures. (3/100)**
- **Attendance. (3/100)**
- **Monthly examinations (30/100)**
- **Mid-year examinations. (60/100)**

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	AISC Manual 15th edition Structural Steel Design 5th edition, Jack C. McCormac
Main references (sources)	AISC Manual 15th edition Structural Steel Design 5th edition, Jack C. McCormac
Recommended books and references (scientific journals, reports…)	William T. Segui "Steel Design", 6th Edition, 2018. McCormac, J.C., "Structural Steel Design", 6th Edition, 2018
Electronic References, Websites	William T. Segui "Steel Design", 6th Edition, 2018. McCormac, J.C., "Structural Steel Design", 6th Edition, 2018