

DEPARTMENT OF CIVIL ENGINEERING  
COURSE SYLLABUS

Course Details				
<b>Code</b>		<b>Academic Year</b>		<b>Semester</b>
BAU301		3		Fall
<b>Title</b>		<b>T</b>	<b>A</b>	<b>L</b>
Structural Engineering II		4	2	-
<b>ECTS</b>		6		
<b>Language</b>	German			
<b>Level</b>	<b>Undergraduate</b>	✓	<b>Graduate</b>	<b>Postgraduate</b>
<b>Department / Program</b>	Civil Engineering			
<b>Forms of Teaching and Learning</b>	Formal			
<b>Course Type</b>	<b>Compulsory</b>	✓	<b>Elective</b>	
<b>Objectives</b>	<p>This course aims to enable students to comprehend the stability problems of components subjected to compressive stress (buckling, lateral-torsional buckling, torsional buckling tendency, and the model column method). It seeks to develop their understanding of prestressing principles and their application in engineering practices. Additionally, it intends to equip students with the ability to determine and evaluate the ultimate load capacity of composite steel beams. The course also aims for students to learn the design principles of typical steel construction joints, including welded and bolted connections. Finally, it is intended that students grasp plate structure theory and the analysis methods of solid covering plates, applying them in structural design processes.</p>			
<b>Content</b>	<p>This course encompasses the fundamental principles of designing steel and reinforced concrete structural elements. It includes topics on cross-section design, connection details, and stability analysis of steel structural members. The course also covers the sizing of reinforced concrete elements, reinforcement arrangements, and calculation methods for determining load-bearing capacities. Additionally, it incorporates the design principles of these structural elements in compliance with international standards and regulatory requirements.</p>			
<b>Prerequisites</b>	BAU203			
<b>Coordinator</b>	Assoc. Prof.Dr. Serdar Ulusoy			
<b>Lecturer(s)</b>	Assoc. Prof.Dr. Serdar Ulusoy			
<b>Assistant(s)</b>	Research Assist. Uğur Günay			
<b>Work Placement</b>				
Recommended or Required Reading				
<b>Books / Lecture Notes</b>	<p>Krauss, F., &amp; Führer, W. (2011). Grundlagen der Tragwerklehre: Band 2. Springer. Zilch, K., Diederichs, C. J., &amp; Katzenbach, R. (2002). Konstruktiver Ingenieurbau und Hochbau (pp. 595-1094). Springer Berlin Heidelberg.</p>			
<b>Other Sources</b>				

DEPARTMENT OF CIVIL ENGINEERING  
COURSE SYLLABUS

Additional Course Material			
Documents			
Assignments			
Exams			
Course Composition			
Mathematics und Basic Sciences			%
Engineering	50		%
Engineering Design	50		%
Social Sciences			%
Educational Sciences			%
Natural Sciences			%
Health Sciences			%
Expert Knowledge			%
Assessment			
Activity	Count		Percentage (%)
Midterm Exam	1		40
Quiz			
Assignments			
Attendance			
Recitations			
Projects			
Final Exam	1		60
		<b>Total</b>	<b>100</b>
ECTS Points and Work Load			
Activity	Count	Duration	WorkLoad (Hours)
Lectures	14	4	56
Self-Study	13	6	78
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	3	3
Recitations	14	2	28
Laboratory			
Projects			
Final Exam	1	3	3

DEPARTMENT OF CIVIL ENGINEERING  
COURSE SYLLABUS

<b>Total Work Load</b>		<b>168</b>
<b>ECTS Points</b> (Total Work Load / Hour)		<b>6</b>
<b>Learning Outcomes</b>		
<b>1</b>	Students acquire knowledge about structural engineering regulations such as Eurocode 2, 3, and 5.	
<b>2</b>	Students learn the characteristic strength properties of structural materials and gain knowledge of their load-bearing capacities.	
<b>3</b>	Students gain the necessary knowledge and skills to design cross-sections of steel elements that do not compromise stability.	
<b>4</b>	Students acquire the knowledge and skills to design cross-sections of reinforced concrete components under different loading conditions.	
<b>5</b>		
<b>6</b>		
<b>7</b>		
<b>8</b>		
<b>9</b>		
<b>10</b>		
<b>11</b>		
<b>12</b>		
<b>Weekly Content</b>		
<b>1</b>	introduction Stability theory: buckling concept of buckling length	
<b>2</b>	Stability theory: N + My Buckling lengths, pendulum supports Stability Theory: N (Replacement st.) Buckling lengths, pendulum supports	
<b>3</b>	model support method Model Column - Moment Curvature Relation Stability Theory: N (Theo II. O.) Stability Theory: N+My	
<b>4</b>	Stability Theory: N+My Stability theory: N + My + Mz model support procedure Stability theory: M+My+Mz	
<b>5</b>	model support method other stability issues Stability theory: M+My+Mz	
<b>6</b>	Model support method (M-k) BDK, proof of the compression belt, tilting model support method	
<b>7</b>	BDK, proof of the compression belt, tilting Bias : Theory preload BDK	
<b>8</b>	Midterm	
<b>9</b>	preload Construction, composite beam composite beam preload	
<b>10</b>	compound (pos. / neg. moment) Fasteners: screws Means of connection: welding composite beam	
<b>11</b>	compound (pos. / neg. moment) Fasteners: screws Means of connection: welding composite beam	
<b>12</b>	Means of connection: screws I (tension joint) Plates I Plates II Screw connection & console connection	

DEPARTMENT OF CIVIL ENGINEERING  
COURSE SYLLABUS

13	Lanyards: Bolts II (beam splice) Means of connection: welding Plates I welded joint
14	Plates II dot plate dot plate 1 plate dimensioning
15	Plates II dot plate dot plate 1 plate dimensioning
16	Final Exam

**Contribution of Learning Outcomes to Program Objectives(1-5)**

	P1	P2	P3	P4	P5	P6	P7
1	5	4			4	5	5
2	5	4			4	5	4
3	5	4			4	5	4
4	5	4			4	5	5
5							
6							
7							
8							
9							
10							
11							
12							

**Contribution Level** 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

**Compiled by:** Res. Assist. Halit Emre Uygun

**Date of Compilation:** 27.02.2026