
 <b>OSTİM TEKNİK ÜNİVERSİTESİ</b> A N K A R A	<b>FACULTY OF ENGINEERING COURSE SYLLABUS FORM</b>	Doküman No	MF.FR.003
		Revizyon Tarihi	13.11.2024
		Revizyon No	01
		Sayfa No	1 / 4

AERO 304 - AEROSPACE STRUCTURES					
Course Code	Course Name			Semester	
AERO 304	Aerospace Structures			Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/> Summer <input type="checkbox"/>	
Hours				Credit	ECTS
Theory	Practice	Lab		3	6
3	0	0			

Course Details	
Department	Aerospace Engineering
Course Language	English
Course Level	Undergraduate <input checked="" type="checkbox"/> Graduate <input type="checkbox"/>
Mode of Delivery	Face to Face <input checked="" type="checkbox"/> Online <input type="checkbox"/> Hybrid <input type="checkbox"/>
Course Type	Compulsory <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
Course Objectives	<p>This course aims to provide a comprehensive understanding of aircraft and spacecraft structures, focusing on the key principles of structural analysis and design. Students will gain insights into the loads acting on airplanes, the effects of maneuvering, and the importance of airworthiness. The course will cover critical structural elements such as fuselage frames and wing ribs, as well as energy methods in structural analysis. Additionally, it will explore the analysis of thin-walled structures and multi-cell beams, emphasizing elastic stability and the challenges involved in aerospace engineering design. Through this course, students will acquire the necessary knowledge to analyze and design efficient and safe aerospace structures.</p>
Course Content	<p>Introduction to Aircraft Structures  Loads Acting on Airplanes  Maneuvering and V-n diagrams  Airworthiness  Structural Elements  Spacecraft Structures  Energy Methods in Structural Analysis  Structural Analysis of Thin Walled Structures  Analysis of Multi-Cell Beams  Fuselage Frames and Wing Ribs  Elastic Stability</p>
Course Method/ Techniques	Lecture <input checked="" type="checkbox"/> Question & Answer <input type="checkbox"/> Presentation <input checked="" type="checkbox"/> Discussion <input type="checkbox"/>
Prerequisites/ Corequisites	AERO 202
Work Placement(s)	

 <b>OSTİM TEKNİK ÜNİVERSİTESİ</b> A N K A R A	<b>FACULTY OF ENGINEERING COURSE SYLLABUS FORM</b>	Doküman No	MF.FR.003
		Revizyon Tarihi	13.11.2024
		Revizyon No	01
		Sayfa No	2 / 4

### Textbook/References/Materials


- Text-book: Megson, T.H.G., Aircraft Structures for Engineering Students, 3rd Edition.
- Other: Niu, M. C. Y., Airframe Structural Design, 2011, Adaso/Adastra Engineering Ltd.
- Niu, M. C. Y., Airframe Stress Analysis and Sizing, 2011, Adaso/Adastra Engineering Ltd.

### Course Category

Mathematics and Basic Sciences	<input type="checkbox"/>	Education	<input type="checkbox"/>
Engineering	<input checked="" type="checkbox"/>	Science	<input type="checkbox"/>
Engineering Design	<input type="checkbox"/>	Health	<input type="checkbox"/>
Social Sciences	<input type="checkbox"/>	Profession	<input type="checkbox"/>


### Weekly Schedule

No	Topics	Materials/Notes
1	Introduction to Aerospace Structures Loads Acting on Airplanes (Landing, Engine, Take-off, Weight, Inertia, Other) Maneuvering and V-n diagrams Airworthiness	
2	Main Structural Elements of Aircraft Structures Spacecraft Structures	
3	Main Structural Elements of Aircraft Structures Spacecraft Structures	
4	Energy Methods in Structural Analysis	
5	Energy Methods in Structural Analysis	
6	Structural Analysis of Thin Walled Open Section Box Beams	
7	Structural Analysis of Thin Walled Open Section Box Beams	
8	Midterm Exam	
9	Structural Analysis of Thin Walled Closed Section Box Beams Analysis of Multi-Cell Beams	
10	Structural Analysis of Thin Walled Closed Section Box Beams Analysis of Multi-Cell Beams	
11	Fuselage Frames and Wing Ribs	
12	Fuselage Frames and Wing Ribs	
13	Elastic Stability	
14	Elastic Stability	
15	Elastic Stability	
16	Final Exam	

 <b>OSTİM TEKNİK ÜNİVERSİTESİ</b> A N K A R A	<b>FACULTY OF ENGINEERING COURSE SYLLABUS FORM</b>	Doküman No	MF.FR.003
		Revizyon Tarihi	13.11.2024
		Revizyon No	01
		Sayfa No	3 / 4

<b>Assessment Methods and Criteria</b>		
<b>In-term studies</b>	<b>Quantity</b>	<b>Percentage</b>
Attendance		
Lab		
Practice		
Fieldwork		
Course-specific internship		
Quiz/Studio/Criticize		
Homework		
Presentation / Seminar		
Project	1	20%
Report		
Seminar		
Midterm Exam	1	30%
Final Exam	1	50%
<b>Total</b>		<b>100%</b>
<b>Contribution of Midterm Studies to Success Grade</b>		50%
<b>Contribution of End of Semester Studies to Success Grade</b>		50%
<b>Total</b>		<b>100%</b>

<b>ECTS Allocated Based on Student Workload</b>			
<b>Activities</b>	<b>Quantity</b>	<b>Duration (Hrs)</b>	<b>Total Workload</b>
Course Hours	16	3	48
Lab			
Practice			
Fieldwork			
Course-specific Work Placement			
Out-of-class study time	14	2	28
Quiz/Studio/Criticize			
Homework			
Presentation / Seminar			
Project	1	15	15
Report	1	20	20
Midterm Exam and Preparation for Midterm	1	10	10
Final Exam and Preparation for Final Exam	1	17	17
<b>Total Workload</b>			<b>138</b>
<b>Total Workload / 25</b>			<b>5.52</b>
<b>ECTS Credit</b>			<b>6</b>

 <b>OSTİM TEKNİK ÜNİVERSİTESİ</b> A N K A R A	<b>FACULTY OF ENGINEERING COURSE SYLLABUS FORM</b>	Doküman No	MF.FR.003
		Revizyon Tarihi	13.11.2024
		Revizyon No	01
		Sayfa No	4 / 4

<b>Course Learning Outcomes</b>	
<b>No</b>	<b>Outcome</b>
<b>L1</b>	Students will be able to understand the components of aircraft and spacecraft structures, analyze the various loads acting on aircraft, and interpret V-n diagrams and maneuvering loads.
<b>L2</b>	Students will be able to assess the airworthiness of aerospace structures, apply energy methods in structural analysis, and analyze thin-walled and multi-cell structures as well as evaluate the elastic stability of aerospace structures and design and assess structural elements like fuselages and wings.
<b>L3</b>	Students will gain the ability to perform structural analysis using energy methods and advanced techniques.
<b>L4</b>	Students will be able to design and assess aerospace structural components, solve structural problems ensuring integrity and safety, and interpret and apply load diagrams and technical data.
<b>L5</b>	Students will also develop an understanding of materials used in aerospace structures and be capable of effectively communicating structural analysis in reports and discussions.

<b>Contribution of Course Learning Outcomes to Program Competencies/Outcomes</b>												
<i>Contribution Level: 1: Very Slight, 2: Slight, 3: Moderate, 4: Significant, 5: Very Significant</i>												
	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	<b>P5</b>	<b>P6</b>	<b>P7</b>	<b>P8</b>	<b>P9</b>	<b>P10</b>	<b>P11</b>	<b>Total</b>
<b>L1</b>	5	5	5	4			3	3	3	3	2	33
<b>L2</b>	5	5	4	4			3		4	3		28
<b>L3</b>	4	4	4	5			3		3	3		26
<b>L4</b>	5	4	5	4			3		3	4		28
<b>L5</b>	4	3	4	3		4	5		4	3	2	31
<b>Total</b>												<b>146</b>