

STABILITY OF STRUCTURES

1	Course Title:	STABILITY OF STRUCTURES	
2	Course Code:	INS5223	
3	Type of Course:	Optional	
4	Level of Course:	Second Cycle	
5	Year of Study:	1	
6	Semester:	1	
7	ECTS Credits Allocated:	7.50	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:		
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. M.ÖZGÜR YAYLI	
15	Course Lecturers:	Doç. Dr. M. Özgür YAYLI	
16	Contact information of the Course Coordinator:	bdeliktas@uludag.edu.tr 224 2900744 Uludağ Univ. Müh.Mim Fak. İnşaat Müh. Böl. Görükle, Bursa	
17	Website:	http://insaat.uludag.edu.tr	
18	Objective of the Course:	<ul style="list-style-type: none"> • Understanding the stability of structures. Elastic buckling. • Calculation of critical buckling loads and buckling loads in higher modes using various methods. • Explanation of torsion buckling and lateral buckling. 	
19	Contribution of the Course to Professional Development:	<ul style="list-style-type: none"> • Understanding and examining buckling phenomenon in structural engineering, • To be able to investigate the buckling behavior of structural elements and systems under compressive load and the problems that may arise, • Obtaining buckling loads in columns and frames with various methods. 	
20	Learning Outcomes:		
		1	• Understanding and examining buckling phenomenon in structural engineering,
		2	• To be able to investigate the buckling behavior of structural elements and systems under compressive load and the problems that may arise,
		3	• Obtaining buckling loads in columns and frames with various methods.
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21	Course Content:		
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Week	Theoretical	Practice	

1	Stability of equilibrium, large displacement theory of columns																																																							
2	Large displacement theory of columns, columns with primitive curvature, columns with eccentrically loaded																																																							
3	Inelastic buckling of columns																																																							
4	General theory of columns, interloaded columns																																																							
5	Variable cross-section columns, approximate methods for buckling loads																																																							
6	Sequential approximation methods																																																							
7	Finite difference method																																																							
8	Variation methods, Rayleigh-Ritz Method																																																							
9	Rayleigh-Ritz Method, finite element method																																																							
10	finite element method																																																							
11	Beam-columns, buckling of frames																																																							
12	Buckling of frames, torsion buckling of bars																																																							
13	Lateral buckling of bars																																																							
14	Lateral buckling of bars, accent stability																																																							
22	Textbooks, References and/or Other Materials:	<ul style="list-style-type: none"> • Alexander Chajes, Principles of Structural Stability Theory, Prentice-Hall, 1974 (paperback edition Waveland Press, 1993) • Z. P. Bazant and L. Cedolin, Stability of Structures 																																																						
Activites		<table> <tr> <th>Number</th><th>Duration (hour)</th><th>Total Work Load (hour)</th></tr> <tr> <td>Theoretical</td><td>3.00</td><td>42.00</td></tr> <tr> <td>Practicals/Labs</td><td>0.00</td><td>0.00</td></tr> <tr> <td>Self study and preperation</td><td>12.00</td><td>168.00</td></tr> <tr> <td>Homeworks</td><td>0.00</td><td>0.00</td></tr> <tr> <td>Assessment Projects</td><td>0.00</td><td>0.00</td></tr> <tr> <td colspan="2">TERM LEARNING ACTIVITIES</td><td></td></tr> <tr> <td>Field Studies</td><td>0.00</td><td>0.00</td></tr> <tr> <td>Midterm Exams</td><td>12.00</td><td>12.00</td></tr> <tr> <td>Others</td><td>0.00</td><td>0.00</td></tr> <tr> <td>Final Exams</td><td>3.00</td><td>3.00</td></tr> <tr> <td>Total Work Load</td><td></td><td>225.00</td></tr> <tr> <td>Total work load/ 30 hr</td><td>7.50</td><td></td></tr> <tr> <td>ECTS Credit of the Course</td><td></td><td>7.50</td></tr> <tr> <td>Success Grade</td><td colspan="2"></td></tr> <tr> <td>Contribution of Final Exam to Success Grade</td><td colspan="2">60.00</td></tr> <tr> <td>Total</td><td colspan="2">100.00</td></tr> <tr> <td>Measurement and Evaluation Techniques Used in the Course</td><td colspan="2">Understanding the principles of applied mathematics used in the course</td></tr> </table>	Number	Duration (hour)	Total Work Load (hour)	Theoretical	3.00	42.00	Practicals/Labs	0.00	0.00	Self study and preperation	12.00	168.00	Homeworks	0.00	0.00	Assessment Projects	0.00	0.00	TERM LEARNING ACTIVITIES			Field Studies	0.00	0.00	Midterm Exams	12.00	12.00	Others	0.00	0.00	Final Exams	3.00	3.00	Total Work Load		225.00	Total work load/ 30 hr	7.50		ECTS Credit of the Course		7.50	Success Grade			Contribution of Final Exam to Success Grade	60.00		Total	100.00		Measurement and Evaluation Techniques Used in the Course	Understanding the principles of applied mathematics used in the course	
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24	ECTS / WORK LOAD TABLE																																																							

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	5	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	5	5	3	0	5	5	0	0	0	0	0	0	0	0	0	0
ÖK3	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			