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:	• 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:	• 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:	

Course Content:

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:	• Alexander Chajes, Pinciples of Structural Stability Theory, Prentice-Hall, 1974 (paperback edition Waveland Press, 1993) • Z. P. Bazant and L. Cedolin, Stability of Structures, Oxford University Press, 1991 • W.F.Chen and E.M. Lui, Structural Stability- Theory and Implementation, Prentice Hall , 1987 • Frederich Bleich, Buckling of Metal structures, McGraw Hill, 1952 • S.Timoshenko and J.Gere, Theory of Elastic Stability, McGraw Hill, 1961 (paperback edition by Dover Publications, 2009)
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00

Contribution of Term (Year) Learning Activities to Success Grade	40.00
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

24	**ECTS / WORK LOAD TABLE**

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	12.00	168.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	12.00	12.00
Others	0	0.00	0.00
Final Exams	1	3.00	3.00
Total Work Load			225.00
Total work load/ 30 hr			7.50
ECTS Credit of the Course			7.50

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