

## Subject Title: Dynamic of Structures

<b>Course Basic Information</b>			
<b>Academic Unit:</b>	<b>Faculty of Civil Engineering and Architecture</b>		
<b>Course Name:</b>	<b>Dynamic of Structures</b>		
<b>Level:</b>	<b>Master</b>		
<b>Course Status:</b>	<b>Mandatory</b>		
<b>Year of Study:</b>	<b>1<sup>st</sup> year, II- semester</b>		
<b>Number of Hours per Week:</b>	<b>3+2</b>		
<b>ECTS Credits:</b>	<b>6 ECTS</b>		
<b>Time /Venue:</b>	<b>According to timetable</b>		
<b>Course Teacher:</b>	<b>Prof. asoc.Dr. Misin Misini</b>		
<b>Contact Details:</b>	<b>e-mail: <a href="mailto:misin.misini@uni-pr.edu">misin.misini@uni-pr.edu</a></b>		
<b>Course Description</b>			
	Response of single and multiple degree of freedom systems to dynamic excitation; structural modeling and approximate solutions. Modeling and analyzing civil engineering structures as generalized single degree of freedom systems. Modeling and analyzing buildings as multiple degree of freedom systems. Evaluating the response of building structures to earthquake ground motions.		
<b>Course Objectives:</b>			
	To expose the students the principles and methods of dynamic analysis of structures and to prepare them for designing the structures for wind, earthquake and other dynamic loads		
<b>Learning Outcomes:</b>			
	After completion of the course the students will have the knowledge of vibration analysis of systems with different degrees of freedom and they know the method of damping the systems		
<b>Student Workload (Consistent with the Learning Outcomes)</b>			
<b>Activity</b>	<b>Hours</b>	<b>Day/ Week</b>	<b>Total</b>
Lectures	3	15	45
Theory/ Lab Work	2	15	30
Practical Work			
Contact Hours with Teacher /Consultations during Office Hours	1	9	9
Field Work			
Colloquium, Seminars	4	4	16
Homework	4	5	20
Self-study Time (in the Library or at Home)	2	5	10
Final Exam Preparation	1	10	10
Evaluations (Tests, Quiz, Final exam)	2	5	10

Projects, Presentations, etc.			
<b>Total</b>			<b>150</b>
<b>Teaching Methodology:</b>			
	<i>Lectures + Exercises</i>		
<b>Evaluation Methods:</b>			
	Attendance 5%; First Evaluation 30%; Second Evaluation 25%; Individual work 10%, final exam for those who have not passed the first and second evaluation.		
<b>Basic Literature:</b>			
	<p>[1] Clough R., Penzien J.: <i>Dynamics of Structures</i>, McGraw-Hill, 2ndEd 1993</p> <p>[2] Chopra A.: <i>Dynamics of Structures-Theory and Applications to Earthquake Engineering</i>, Prentice-Hall, New York, 1996</p> <p>[3] Misini M.: <i>Dinamika e konstruksioneve, leksione të shkruara</i>, UP, FNA, Prishtinë 2018</p>		
<b>Additional Literature:</b>			
	[2] Niko Pojani: <i>Teoria e strukturave DINAMIKA</i> , shblu Tiranë, 2002		

<b>Course Plan:</b>	
<b>Week</b>	<b>Title of the Lecture</b>
<b>Week 1:</b>	Fundamental Objective of Structural Dynamics Analysis, Methods of Discretization, Formulation of the Equations of Motion.
<b>Week 2:</b>	Single degree of freedom systems, Equation of Motion, Analysis of Undamped Free Vibrations
<b>Week 3:</b>	Response to General Dynamic Loading, Response to Harmonic Loading,
<b>Week 4:</b>	Response to Periodic Loading
<b>Week 5:</b>	Response to Impulsive Loading
<b>Week 6:</b>	Multi degree of freedom systems, Formulation of the Equations of Motion, Evaluation of Structural Property Matrices
<b>Week 7:</b>	Elastic Properties, Mass Properties, Damping Properties, External Loading
<b>Week 8:</b>	Undamped Free Vibrations, Analysis of Vibration Frequencies, Analysis of Vibration Mode Shapes
<b>Week 9:</b>	Analysis of Dynamic Response Using Superposition
<b>Week 10:</b>	Vibration Analysis by Matrix Iteration
<b>Week 11:</b>	Distributed parameter systems, Partial Differential Equations of Motion
<b>Week 12:</b>	Analysis of Undamped Free Vibrations,
<b>Week 13:</b>	Analysis of Dynamic Response
<b>Week 14:</b>	Earthquake engineering, Seismological Background
<b>Week 15:</b>	Design Response Spectra

<b>Academic Policies and Rules of Civility:</b>
<p><i>Regular attendance of lectures and exercises</i></p> <p><i>Mobile phones need to be switched off during class.</i></p> <p><i>Attending the class in time.</i></p>