

COURSE GUIDE – short form

Academic year 2014-2015

Course name ¹	Advanced Elements of Elasticity and Plasticity					Course code	MDET.DI. DA.104		
Course type ²	DS	Category ³	DI	Year of study	I	Semester	1	Number of credit points	7

Faculty	Mechanical Engineering	Number of teaching and learning hours ⁴						
Field	Mechanical Engineering	Total	L	T	LB	P	IS	
Specialization	Diagnosis and Technical Expertise in Mechanical Engineering	56	28			28	112	

Pre-requisites from the curriculum ⁵	Compulsory	
	Recommended	Strength of Materials

General objective ⁶	Determination and comparison the different states of strains and stresses (triaxial, plane states) based on the theory of elasticity (for isotropic, orthotropic and anisotropic materials) and in the elasto-plastic range
Specific objectives ⁷	<ul style="list-style-type: none"> • strains tensor, stresses tensor • principal stresses, principal strains • fundamental equations • strain energy • theory of strength • calculus in elasto-plastic range for different state of stresses • calculus of residual stress and strain
Course description ⁸	<p>Variation of stresses about a point, principal stresses, Mohr's circle</p> <p>Variation of strains about a point, principal strains</p> <p>Equilibrium equations (Cauchy), equations of continuity (compatibility), Hooke's generalized equations,</p> <p>Strain energy, strain energy involved in changing volume and form</p> <p>Theories of strength</p> <p>Dislocations and plastic deformation</p> <p>Tresca (distorsion energy criterion) and von Mises (maximum shear stress criterion) yield criteria, yield surface for Tresca and Mises criteria</p> <p>Idealised flow curves</p> <p>Calculus in elasto-plastic range for axial, torsion and bending. Residual stress and strain</p> <p>The elasto-plastic state of a thin walled tube.</p>

Assessment			Schedule ⁹	Percentage of the final grade (minimum grade) ¹⁰
Continuous assessment	Class tests along the semester			%
	Activity during projects		Weeks 1-14	30%
	Assignments		Weeks 2-13	20%
Final assessment	Final assessment form ¹¹	Exam	Exam period	50%
	Examination procedures: The written test theoretical topics and applications			

Course organizer	Associate Professor Mocanu Florentina	
Teaching assistants	Associate Professor Mocanu Florentina	

¹Course name from the curriculum

² DF – fundamental, DID – in the field, DS – specialty, DC – complementary (from the curriculum)

³ DI – imposed, DO –optional, DL – facultative (from the curriculum)

⁴ Points 3.8, 3.5, 3.6a,b,c, 3.7 from the Course guide – extended form (L-lecture, T-tutorial, LB-laboratory works, P-project, IS-individual study)

⁵ According to 4.1 – Pre-requisites - from the Course guide – extended form

⁶ According to 7.1 from the Course guide – extended form

⁷ According to 7.2 from the Course guide – extended form

⁸ Short description of the course, according to point 8 from the Course guide – extended form

⁹ For continuous assessment: weeks 1 – 14, for final assessment – colloquium: week 14, for final assessment-exam: exam period

¹⁰ A minimum grade might be imposed for some assessment stages

¹¹ Exam or colloquium