POLITEHNICA University of Bucharest (**UPB**)
Faculty of Engineering and Management of Technological Systems (**IMST**)
Study Programmed: Industrial Engineering (**IE**)
Form of study: License (Bachelor)

COURSE SPECIFICATION

Course title:	Mechanics of materials II	***Semester:***	3
Course code:	UPB.06.D.03.O.002	***Credits (ECTS):***	7

Course structure	Lecture	Applications	Laboratory	Project	Total hours
Number of hours per week	2	2	2	-	6
Number of hours per semester	28	28	28	-	84

Lecturer	Lecture	Seminar / Laboratory / Project
Name, academic degree	Prof. Stefan Dan Pastrama	Prof. Gabriel Jiga
Contact (email, location)	Dept. Of Strength of Materials, e-mail: stefan.pastrama@upb.ro CA 013, CJ 101	Dept. Of Strength of Materials, e-mail: gabijiga@yahoo.com CA006

Course description:

The course Mechanics of Materials 2 is a continuation of the course Mechanics of Materials 1, taught in the previous semester. The main topics of this course are: 1. Statically indeterminate beams and systems of beams; 2. Buckling of struts; 3. Dynamic loadings; 4. Elements of theory of elasticity and strength theories; 5. Fatigue of metals; 6. Methods for experimental measurements of stresses and strains; 7. Thick walled tubes and rotating discs. The course intends to bring to the students a correct understanding of the phenomena connected with loading and deformation of mechanical structures. The students will learn the methodologies specific for mechanics of deformable bodies with focus on calculus of stresses and strains in one dimensional and two dimensional structures and the use of strength, stiffness and stability criteria for investigations on elastic structures. Also, the use of numerical methods and experimental techniques for determination of stresses and strains in mechanical structures will be presented.

Applications / Laboratory / Project description:

In the hours of practical applications, the main topics presented at the lectures will be illustrated with practical problems. In this way, the theoretical knowledge will be put in practice by learning how to solve different types of problems and by undertaking experimental and numerical laboratory themes.
Applications with strong practical character will strengthen theoretical aspects, notions and relationships that form the basics of strength calculations. Experimental methodologies for determination of stress and strain state will be presented (strain gauges, photoelasticity and applications in the calculation of statically indeterminate beams, buckling and impact loading). Calculations presented in the applications hours will be also solved either using the strength of materials code MDSolids or “home-made” programs with finite elements.

Intended learning outcomes:
Acquirement of basic knowledge from mechanics of deformable bodies, necessary for a correct approach of technical problems and for a general view on problems concerning strength, stiffness and stability of mechanical structures in order to design reliable structures.

Assessment method:	% of the final grade	Minimal requirements for award of credits
Written exam	40	50%
Report / project	-	-
Homework	-	-
Laboratory	30	-
Applications	30	-

References:
1. J. Case, A.H. Chilver, C.T.F. Ross - Strength of Materials and Structures – fourth edition, Arnold Publishers, UK, 1999, ISBN 0340719206. 2. D.W.A. Rees - Mechanics of Solids and Structures, Imperial College Press, UK, 2000, ISBN 1860942172 3. R.J. Asaro, V.A. Lubarda - Mechanics of Solids and Materials, Cambridge University Press, UK, 2006, ISBN 0511147074 4. G. Jiga, Ş.D. Pastramă (coordinators) – Testegrilă de Rezistenţamaterialelor (Strength of materials tests), ISBN 9975-63-241-8, EdituraTehnică INFO Chişinău, Republica Moldova 2004 (in Romanian).

Prerequisites:	***Co-requisites*** ***(courses to be taken in parallel as a condition for enrolment):***
Mechanics of materials I, Solid mechanics, Mathematics, Physics, Technical drawing	Machine elements

Additional relevant information:
The lectures will be delivered both in the classic way (demonstrations of specific relationships, theorems and laws on the blackboard) and in electronic way using PowerPoint files. Practical examples will accompany the theoretical aspects. Computer files as a support for the lectures will be delivered to students. The tests during the semester can be repeated at the end of semester.

Date: 29.06.2016
Professional degree, Surname, Name:

Professor Stefan Dan PASTRAMA