POLITEHNICA University of Bucharest (**UPB**)
Faculty of Industrial Engineering and Robotics (**IIR**)
Study Programme: Industrial Engineering (**IE**)
Form of study: Licence (Bachelor)

COURSE SPECIFICATION

Course title:	Mathematics 2	*Semester:*	2
Course code:	UPB.06.F.02.O.002	*Credits (ECTS):*	6

Course structure	Lecture	Seminar	Laboratory	Project	Total hours
Number of hours per week	2	2			4
Number of hours per semester	28	28			56

Lecturer	Lecture	Seminar / Laboratory / Project
Name, academic degree	Pitea Ariana, Professor	Pitea Ariana, Professor
Contact (email, location)	apitea@mathem.pub.ro arianapitea@yahoo.com Department of Mathematics & Informatics R412	apitea@mathem.pub.ro arianapitea@yahoo.com Department of Mathematics & Informatics

Course description:
By the use of methods specific to the course Mathematics 2, there can be modelled real world phenomena, such as mechanical work, flow, energy etc. of significant importance in engineering, game theory, information theory. A good comprehension of these phenomena necessarily imposes a solid background knowledge of the basic notions of differentiability and integrability. The course refers to notions connected with the number sequences, series of numbers, power series and numerical computation, partial derivatives, the Frechet differential, the Gateaux differential, connections between these types of differentiability, determination of the extrema (free or with constraints) (maximizing the profit, minimizing the cost, the optimal growth), improper integrals, the Euler functions, line integrals, double integrals, triple integrals, surface integrals and the connection between these types of integrals (the Green-Riemann formula, the Gauss-Ostrogradski formula, the Stokes formula) and their real world applications.
Seminar / Laboratory / Project description:
The problems approached during the seminar are carefully selected, according to the material presented at the course, by underlying the real world applications in engineering and economics, in connection with the course (flow, circulation, mechanical work, maximizing profit, minimizing loss, population growth). Conversation is one of the main teaching methods. Open problems are also enounced and proposed solutions are discussed and corrected/improved.
Intended learning outcomes:

- comput the extrema and conditional extrema for functions of several variables; - comput Riemann integrals (proper, improper), multiple integrals - comput line and surface integrals; - make calculations, proofs and applications for solving industrial engineering specific tasks based on knowledge of fundamental sciences .	
- the association of knowledge, principles and methods of the technical sciences in the field with graphical representations in order to solve specific tasks.	

Assessment method:	% of the final grade	Minimal requirements for award of credits
Written exam	40%	At least 50% from the standard imposed for the maximum grade.
Report / project		
Homework		
Laboratory		
Other	60%	At least 50% from the standard imposed for the maximum grade.

References:

M. Postolache: Analiza matematica (teorie si aplicatii), Fair Partners, 2014
M. Postolache, A. Pitea, D. Cioroboiu: Calcul integral, Fair Partners, 2015
M. Postolache, A. Pitea, D. Cioroboiu: Calcul diferential, Fair Partners, 2011

Prerequisites:	Co-requisites *(courses to be taken in parallel as a condition for enrolment):*
Mathematics 1	

Additional relevant information:

Basic notions of Mathematical Analysis and Algebra (high school) have to be known.

Date:

Professional degree, Surname, Name: Prof. Pitea Ariana