

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

COURSE SPECIFICATION

Course title:	<i>Mechanical Systems Design</i>	Semester:	5
Course code:	UPB.06.D.05.O.001	Credits (ECTS):	4

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

Lecturer	Lecture	Seminar / Laboratory / Project
<i>Name, academic degree</i>	Prof. George ADÎR, PhD.	Prof. George ADÎR, PhD.
<i>Contact (email, location)</i>	georgeadir@yahoo.com JC112	georgeadir@yahoo.com JC106

Course description:

The target of the course is to assimilate the fundamental theoretical and practical notions as regards the analysis and design of some technical systems (mechanisms, machines, manipulators, robots) typical to the specialization directions of the faculty. Also, the students / graduates will be able for an adequate use of the theoretical and practical knowledge, as well as the specific terms of the discipline, for design, experimentation and achievement of some mechanical systems, simple and / or complex, necessary to improve the activity in different fields of activity. By using this discipline, many notions and technical designs in industrial engineering will be explained much easier, contributing in this way to create a responsible and positive attitude against science, generally, and industrial engineering, particullary.

The course will allow to achieve the adequate conditions for the development of the creativity in the field of industrial engineering, of their own social- professional development, efficient capitalization of the engineering potential, establishing of partnerships with companies, institutions or potential private investors, promotion of the technical innovations.

Seminar / Laboratory / Project description:

The applications are dedicated to setting and deepening knowledge as regards the constructive solutions of the mechanical systems introduced to the course and experimental determination of the constructive, kinematic and dynamic parameters of some mechanical systems.

The laboratory activity wants to underline the theoretical knowledge introduced by lecture, by supporting students to clearly understand many notions, starting from the kinematic elements and kinematic joints up to structure, analysis and synthesis of mechanical systems. In this way, the students have the opportunity to use a lot of different constructive patterns (with linkages, with gears and with cams) and modern techniques to establish the kinematic and kinetostatic parameters.

Intended learning outcomes:

An easier understanding of the structural schemes of different mechanical systems and of their kinematics, kinetostatics and dynamics. Also, the graduates will be able to better understand the phenomena that happen inside of mechanical systems. They could develop a creative work and become more responsible in designing new and efficient mechanical structures to improve the quality of life.

The graduates will establish in a more comfortable and positive way various partnerships with private / public companies to develop their technical solutions for different problems.

Assessment method:	% of the final grade	Minimal requirements for award of credits
Written exam	40	20%
Report / project	-	-
Homework	20	30%
Laboratory	30	
Other	10	

References:

1. **Adîr G.**, Mechanical Systems Design. Guidebook (*homework, lab, lectures*), Ed. Printech, 2016
2. **Adîr, G.**, Course (in English) e- learning platform
3. **Adîr G.**, Adîr, A., ş.a. Mecanisme. Teorie şi aplicaţii. Ed. Printech, 2013, Bucureşti
4. Grecu, B., **Adîr G.**, ş.a., Mecanisme. Lucrări de laborator, Ed. Bren, 2010
5. **Adîr, G.**, Mecanisme şi organe de maşini, Ed. Printech, Bucureşti, 2003
6. Antonescu, P., Mecanisme, Editura Printech, Bucureşti, 2003
7. Ocnărescu, C., Mecanisme şi manipuloare (I si II), Ed. Bren, 2001
8. Artobolevski, I., I., Theorie des mecanismes et des machines, Edition Mir, Moscow, 1977

Prerequisites:

Mathematics, Mechanics, Machine Elements, Materials Technology, Technical Drawing

Co-requisites

(*courses to be taken in parallel as a condition for enrolment*):

Instrumentation and Measurement, Biomechanical Structures, Robotics, Computer Aided Engineering

Additional relevant information:

It is very important to take part when lecture and labs activity is running, to solve the problems given as homework, to participate at all the tests papers etc.

Date: August 23, 2022

Prof. George ADÎR, PhD