

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

## COURSE SPECIFICATION

<b>Course title</b>	Product Design and Development	<b>Semester</b>	7
<b>Course code</b>	UPB.06.D.07.O.003	<b>Credits (ECTS)</b>	6

<b>Course structure</b>	Lecture	Seminar	Laboratory	Project	Total hours
<i>Number of hours per week</i>	2		2	2	6
<i>Number of hours per semester</i>	28		28	28	84

<b>Lecturer</b>	Lecture	Seminar / Laboratory / Project
<i>Name, academic degree</i>	DOICIN Cristian, Prof., PhD	ULMEANU Mihaela, Lecturer, PhD
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<b>Course description</b>
<p>A product is something sold by an enterprise to its customers. Product development is the set of activities beginning with the perception of a market opportunity and ending in the production, sale, and delivery of a product. A product development process is the sequence of steps that an enterprise employs to conceive, design and commercialize a product.</p> <p>We focus on the product development activities that benefit from the participation of all the core functions of the firm: marketing, research and manufacturing. A successful product is developed within a team and we expect that the team members have competence in one or more specific disciplines. The methods presented in the course are intended to facilitate problem solving and decision making among people with different disciplinary perspectives.</p> <p>The goal of our course is to present in a clear and detailed way a set of product development methods aimed at bringing together the marketing, design, and manufacturing functions of the enterprise. Our main objectives are focused on the development of the competences in product research, development and management, including:</p> <ul style="list-style-type: none"> <li>▪ the understanding of the contribution of successful products to company benefits;</li> <li>▪ practical principles for selection of organizational structures for an efficient product development;</li> <li>▪ in-depth understanding of product concept and acquiring of an ample methodology for concept generation;</li> <li>▪ a precise and well-structured methodology for product development, including precise methods for gathering and processing the information from customers, principles for establishment of the product design specification and methods for selecting the optimum concept.</li> </ul>
<b>Laboratory &amp; Project description</b>
<p>The activities at the Product Development Lab will follow the six stages of the generic product development process: planning, concept development, system-level design, detailed design, testing and refinement and production ramp-up. The labs will include practical developments of this stages, starting with the principles for identifying and interpreting a customer need and ending with some advanced methods of manufacturing a prototype by additive manufacturing methods.</p>

The labs will use the methodology taught at courses, in a „learning by doing” environment. The students will acquire practical experience in gathering and processing information from customers, in concept generation and in transforming the concepts into products.

The project will focus on developing a new product, by respecting some constraints: (1) There should be a demonstrable market for this product, (2) High likelihood of containing fewer than 10 parts, (3) High confidence in prototype costs being less than 10000 EUR, (4) The product should require no basic technological breakthroughs. No prototype is needed.

### ***Intended learning outcomes***

By attending this course you'll be able to:

- Define, formulate and analyze a problem related to product development area;
- Solve specific problems independently or as part of a team;

By graduating this course you'll have:

- The ability to launch own ideas;
- Expert knowledge of the product development process; from market analysis, product design and manufacturing to market introduction;
- Familiarity with user needs based on specific target groups and ability to conduct market analysis.

The course contributes to the definition of the following competences (selection from the competences of the entire study programme):

- The ability to associate the knowledge, principles and methods of the technical sciences in the field with graphical representations for solving specific tasks.
- The design and management of the production processes.
- The design of the production systems.
- Planning, controlling and quality assurance of the processes and production systems.

<b><i>Assessment method</i></b>	<b>% of the final grade</b>	<b>Minimal requirements for award of credits</b>
Written exam	40	50% of the subjects solved.
Project	25	Handing in the project and solving at least 50% of the chapters within.
Homework	15	50% of the homework solved.
Laboratory	20	Performing the lab sessions, handing in the obtained results and obtaining at least 50% of the points allocated for the laboratory.
Other	-	-

### ***References***

[1] Ulrich C., Eppinger S., Product Design and Development, 6<sup>th</sup> Edition, Ed. McGraw-Hill, 2015;

[2] www.ulrich-eppinger.net.

### ***Prerequisites***

***Computer Aided Design, Mechanical Systems Design, System and Project Management, Manufacturing Processes, Engineering Economics***

### ***Co-requisites***

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### ***Additional relevant information***

The final grade is calculated by rounding the score accumulated by the student at the evaluated activities.

Date: 15.07.2016

Professional degree, Surname, Name: Prof. Doicin Cristian/ Lect. Ulmeanu Mihaela