Study program: Industrial engineering	
Course title: Product Development	
Professor/assistant: PhD. MilošS.Ristić	
Type of course: elective	
ECTS credits: 6	
Pre-requisites:	

Aims of the course: are to prepare a student to:
- inspect technical systems independently and highlight their characteristics;
- learn the methodology of product development;
- design a variant solution for a new product;
- plan the product development process as a project activity;
- understand the place of industrial product development in business environment.

Learning outcomes:
Uponsuccessfulcompletionofthecourse,astudent is able to:
- explain the importance of product development and interpret the life cycle of a particular product.
- assess the basic characteristics of certain technical systems;
- choose the appropriate method for clarifying the problem;
- identify the key elements for improving the existing and developing new products, according to customer or market needs;
- criticize and justify technical solutions of the improved product;
- apply modern tools and equipment (scanner and 3D printer) in the development of prototypes;
- present the team's results.

Syllabus

Theoretical part

Importance of product development. Product life cycle. Integrated product development. Methods and tools for improving product development. Product models. Product development model. Industrial product design. Methods for finding a solution (mind mapping, brainstorming, ...). Reverse engineering. Fast manufacturing technologies. Product development and construction design methods.

Practical part

Technical systems and their characteristics. Clarification of problems and tasks. Check list, Kano model, Benchmarking. Conceptual design of the product. Model sketching. Creating a product model by scanning. Rapid prototyping. Manufacturing products on a 3D printer. Presentation of project results.

Literature
1. Miltenović V., *Razvojproizvoda – strategije, metode, primena*, MašinskifakultetUniverziteta u Nišu, Niš, 2003.
2. Kuzmanović S., *Industrijskidizajn*, Fakultettehničkihnauka u NovomSadu, 2008.
3. Ognjanović M., *Razvojidizajnmašina*, Mašinskifakultet, Beograd, 2007.
4. Trajanović M., Grujović N., Milovanović M., Milivojević V., *Računarskipodržanebrzeproizvodnetehnologije*, Mašinskifakultet u Kragujevcu, 2008.

Number of active classes			Other forms of teaching:
Lectures:	Practical classes:	Research work:	

Teaching methods Theoretical classes are conducted using presentations and video materials. The methods of brainstorming, mind mapping, check-list, benchmarking, target costing should provide systematic thinking during project work. Teamwork should ensure that each team member understands his/her place and makes quality contributions to the process of creating a new product. Working with a scanner on sketching and product modeling, as well as making prototypes on a 3D printer should provide the student with new skills in the use of modern tools. Information systems and various CAx tools should facilitate the process and ensure a high-quality presentation of results.

Grading system (maximum 100 points), **grading scale**from 5 to 10: below 51 points grade 5, grade 6 from 51-60 points, grade7 from 61-70 points, grade8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91-100 points.

Pre-exam obligations	points	**Final exam**	points
activity during theoretical lectures	**10**	written exam	**30**
practical training	**50**	oral exam	
colloquium(s)/seminar papers	**10**		
Sum	**70**	**Sum**	**30**