

IPROD

530577-TEMPUS-1-2012-1-RS-TEMPUS-JPCR

**Improvement of Product Development Studies
in Serbia and Bosnia and Herzegovina**



<http://iprod.masfak.ni.ac.rs>
iprod@masfak.ni.ac.rs



**Karlsruhe Institute of Technology
IPEK**

**Review of the New Master Academic Studies
Curriculum of University of Nis in
Management of Product Development and
Innovations**

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

In General

The master studies curriculum of management of product development and innovations at University of Nis is in general good and is defined according to the high educational standards and regional industry needs. The curriculum of this master program was developed during the IPROD project. The selection of subjects offers a good opportunity for further development and specialization in the field of product development. The curriculum represents a modern study program that is giving the students the chance to obtain modern and adequate knowledge in this special field of mechanical engineering.

The master program of product development and innovations of the University of Nis offers the students the following compulsory subjects:

- International project management
- Integrated product development
- Workshops in product development
- Innovation management
- Business economics
- Master thesis

The following eligible subjects are offered:

- Tools and technologies in product development
- Success factors in product development
- Product development methods
- Protection of intellectual property
- Basics of validation
- Human recourse management in the enterprise environment

The offered subjects are well-done chosen and include all relevant topics in the field of management of product development and innovations.

IPROD

530577-TEMPUS-1-2012-1-RS-TEMPUS-JPCR

**Improvement of Product Development Studies
in Serbia and Bosnia and Herzegovina**



<http://iprod.masfak.ni.ac.rs>
iprod@masfak.ni.ac.rs



**Karlsruhe Institute of Technology
IPEK**

**Final Review of the New Master Academic
Studies Curriculum of University of Nis in
Management of Product Development and
Innovations**

2015

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

In General

The master studies curriculum of Management of Product Development and Innovations at University of Nis is in general good and is defined according to the high educational standards and regional industry needs. The curriculum of this master program was developed during the IPROD project. The selection of subjects offers a good opportunity for further development and specialization in the field of product development. The curriculum represents a modern study program that is giving the students the chance to obtain modern and adequate knowledge in this special field of mechanical engineering. But there are some of topics that should be consider. The topics are presented in this report.

The main problem is a consequence of study system adopted at the faculty level. There is a four years bachelor and a one year master. A one year master program is in principle to short to develop higher scientific competences of the students in this study field. Because a master program should contain– on the contrary to a bachelor program - more scientific subjects and should also give the students enough time and space to get more deeper knowledges in special fields and fields of their interests. So a more than one year master program will be appropriated and much more better in this case.

The Master of Product Development and Innovation of University of Nis provides also the subjects Integrated Product Development and Product Development Methods. The students have to pass both of these subjects in one year. If it will be well-done, this is a very strong program. Because of this the Faculty of Mechanical Engineering of University of Nis have to consider if it is constructive if the students have to pass both of these subjects in one year.

According to this, a mechanical engineering master program with focus on the fields of product development and innovations should include a subject which contains the development and manufacturing of a prototype. Suitable subjects for this could be Integrated Product Development or Workshops in Product Development. Because of this the Faculty of Mechanical Engineering of University of Nis should give the students the possibility to develop and manufacture a prototype in the course of one of this subjects.

Another significant issue is, the master program can also been chosen from students from other faculties like Faculty of Economics or some other faculties from the field of social sciences. To guarantee a purposeful development of all students, there should be a mechanism that students can only choose eligible subjects that are less connected with their former studies.

An advantage of the master program of product development and innovations is that there is a qualification exam for enrollment. So it is guaranteed that only students who are connected to product development can choose the master program. This offers a professional work environment for the students.

The Master Program of Product Development and Innovations of the University of Nis offers the students the following compulsory subjects:

- International Project Management
- Integrated Product Development
- Workshops in Product Development
- Innovation Management
- Business Economics
- Master Thesis

The following eligible subjects are offered:

- Tools and Technologies in Product Development
- Success Factors in Product Development
- Product Development Methods
- Protection of Intellectual Property
- Basics of Validation
- Human Resource Management in the Enterprise Environment

The following sections describe a more detailed assessment of the contents of each subject.

Tools and Technologies in Product Development

The aim of this subject is to train the students in different types of computer aided technologies in the process of product development. After passing the subject the students should be able to use different computer aided technologies independently. The students also should have practical knowledge in the application of computer tools.

According to the course content of this subject the aims of this subjects can be reached. There are also some practical laboratory exercises provided.

Success Factors in Product Development

In the course of this subject the students should acquire basic knowledge of the organization and functioning of production systems and phases of product development from concept to realization. In order to acquire success factors in product development the students should become acquainted with product manufacturability and with modern lightweight structures.

The course contents confirm that the aims of this subject can be reached. There are topics like Design for Manufacturing, Production Technologies and Lightweight Design with it.

Product Development Methods

The subject Product Development Methods should introduce students to methods used in product development. Particular in methods related to product planning, clarification of the task, finding solutions, identification parameters of working ability of the product, making decisions and choice of solutions.

In the course content of this subject all major methods are included. So it is ensured that the aim of the subject can be reached. There is also a team work of three to five students on the implementation of real methods in product development planed. This is very important to develop the soft skills of the students.

Protection of Intellectual Property

The course Protection of Intellectual Property should familiarize students with the essence of the intellectual property rights, rights of the holders of various forms of intellectual property and the possibility of intellectual property protection, as well as technology transfer.

The course contents include all relevant topics like protection of patents, brands and industrial design, copyrights and ownership of the rights of the employees. In summary the course topics are well chosen to reach the target of this subject.

Workshops in Product Development

It is very advantageous that also some workshops are scheduled in the curriculum of master academic studies in management of product development and innovations. Workshops are very helpful for the development of distinctive soft skills of the students like

- the ability to work in a teams,
- the ability to communicate,

- creativity,
- time management,
- systematics and methodical competences,
- and time management,

which are very important competences of today's engineers in the field of mechanical engineering and product development.

International Project Management

The aim of this subject is to gain basic knowledge of paradigms, methods, techniques, strategies, international project management and the ability to respond independently and creatively to the changing conditions of the project environment. After completion of the course the students should be able to independently involve in management processes of the international projects and should be trained for self-assessment of all relevant factors that may influence on the success of the project.

Course contents are Management of the Processes in the Project, the Integrated Project Management, Management of the Project Objectives, Management of the Project's Time, Project Cost Management, Quality Project Management, Management of the Project's Human Resources, Project Communications Management, Management of Project's Risk and Management of Procurement on the Project. Because of this it is guaranteed that the aim of the course can be reached.

Integrated Product Development

The course Integrated Product Development should gain new knowledges with integrated approach in product development, defining product profiles, gain new idea solutions based on physical effects, concepts, drafts and elaborate designs, prototyping and product verification. After finishing the course the students should have the ability to define successfully product profiles, to develop innovative and original products by using creative methods, concepts, idea solutions, drafts and elaborate designs and to make optimal, competitive in market and attractive products using multiple solutions.

The theoretical course contents are well-chosen to reach the aims of the subject Integrated Product Development. As already mentioned at the beginning of this report, the subject Integrated Product Development is a suitable subject for the integration of a workshop which contains the development and manufacturing of a prototype. Because of this the Faculty of Mechanical

Engineering of University of Nis should consider to offer a workshop for the development and manufacturing of a prototype in the course of the subject Integrated Product Development.

Innovation management

The subject Innovation Management should gain new knowledge with systematic planning, managing and control of innovation in organization and should develop the students ability to manage and control of innovation.

The course topics are well chosen to reach the aim of this subject.

Business Economics

The program of the course should be designed to familiarize students with the types of investments and business results of the companies. The aim of the program should be acquire to the students abilities and problem solving skills in the product development process in order to improve business results of the company, by connecting knowledge from different fields.

The course contents confirm that the aims of this subject can be reached. There are topics like Long-Term Sources of Financing, Growth and Development of the Company, Human Resources and Organizational Structure and Core Business Functions of Enterprises with it.

Basics of Validation

The subject should introduce the students into the importance of the process of the validation in product development and in validation methods. It also should introduces the students with the theory of experiment planning and with basic statistical methods in the theory of experiment. The course also should aim to introduce the students to the concept of an experiment, to the acquisition of measurement data and to methods of virtual validation.

The course topics are well chosen to reach the aims of this subject.

Human resource management in the enterprise environment

A good human resource management is an important factor for the success of modern enterprises. To have distinctive skills in the field of human resource management is very fundamental for todays product development managers. So it is very appreciated that the Faculty of Mechanical Engineering of University of Nis offers this subject in the master program.

Master Thesis

The master thesis offers the students the possibility to work independently on a practical task using theoretical knowledge and methods they have learned in the course of their studies.