## Main goals

· Acquiring the necessary knowledge and skills by the master students of technical faculties in the field of innovation and creative techniques for the development of smart market-competitive products and services.

· Mastering the methods, models and IT tools applicable in efficient engineering of the new generation of smart products and services.

· Transfer of acquired engineering competencies in the field of smart products and services to the business entities in the region.

· More efficient use of available human resources and faster integration of the region in the application of European achievements in this area.

Specific objectives

O1: Raising the level of knowledge and skills in the field of smart products and services.

O2: Efficient application of methods and IT tools for engineering a new generation of smart products and services.

O3: Application of creative and innovative techniques, which provides an opportunity for multidisciplinary application of advanced technologies.

O4: Strengthening human and institutional resources in the field of research and development.

O5: Encouragement to development of a modern educational system in one of the most important areas of technology.

O6: Encouragement to strengthen the competitiveness of the national economy.

O7: Increasing the technological readiness of educational institutions and economic entities for Serbia's integration into the EU.

PROJECT ID

Project Name: Smart Products and Services Engineering - SPaSE

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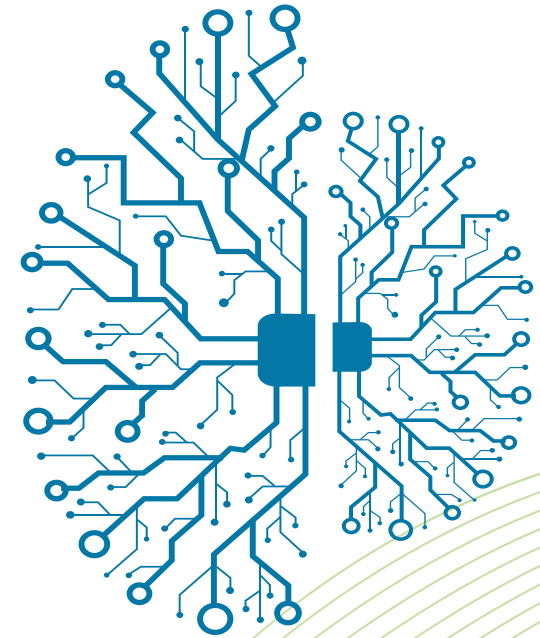
Smart Products and Services Engineering

University of Niš
Univerzitetski trg 2
18106 Niš, Serbia
www.ni.ac.rs

Funded by the European Union

http://spase.ni.ac.rs

L1 — Introduction to the European integration and legislation in the field of smart engineering

Introduction to the existing theoretical understanding of legal, economic, political, and social aspects of European integration. The lectures are based on the interdisciplinary approach regarding the European integration process and its benefits, law, and future aspects especially regarding the field of smart engineering .

L2 — Industry 4.0: Smart products and services engineering

The main goal of the course is to master the knowledge and skills for the efficient application of engineering of the new generation of smart products and services. As part of the course, students will study basic approach in product design and development, modular principle in product development, Industry 4.0 and Reference Architecture Model for Industry 4.0 - RAMI 4.0, holistic approach in product development, smart product and service development models

L3 — Creativity and innovation in product development

Focus is on mastering creative skills and competencies important for smart products and services engineering. Presentation of innovative techniques helpful in developing of future smart products and services.

L4 — Digital product development

The course program will train students to independently use state of the art technologies and methods in the process of development of digital products. The acquired knowledge will enable students to create and holistically administer information, documents and resources in the digital product development process, thus fostering innovation.

L5 — 3D CAD construction

Getting the knowledge about the basic geometrical objects and their relative positions and sections, developing surfaces, as well as the vector analysis and computing graphics. The focus of the course is on parametric design and the proper use of CAD software to produce 3D models, engineering parts, and documentation.

L6 — Information technology

Introduction to the basic IT principles, methods, and techniques. The ultimate goal is the IT education of IT experts, capable of application of information technologies in the industry at all stages during the development of software solutions.

L7 — Artificial intelligence

Introduction to the concepts and algorithms at the foundation of modern artificial intelligence, and exploring the ideas that give rise to smart products and services. Through real world examples, students will gain knowledge to recognize and apply main tools and algorithms of AI and machine learning with the special emphasize on multilayer artificial neural networks (deep learning).

L8 — Big data and data analytics

Upon completion of this course the students should become familiar with the principles of Big data and data analytics, gain understanding of the basic tools and techniques for data collection, processing and analysis. The desired outcome is to stimulate the students to adapt EU legislative in this area and apply main tools and algorithms of these concepts in design of simple smart products and services.

L9 — Internet and sensing technology

This course aims to provide an overview of technologies focusing on the Internet of Things and Industrial Internet of Things. Besides fundamentals and operational principles, the emphasize will be on introducing legal EU requirements and frameworks for building secure and reliable systems, opportunities and challenges, successful real-world practices, and efficient internet and sensing applications.

L10 — Digital twins

Digital twin fundamentals, which integrate the internet of things, artificial intelligence, and software programming, will be introduced as a virtual representation of an object or system during its lifecycle, which is updated from real-time data and uses simulation, machine learning, and reasoning to help decision-making.

L11 — Business models I4.0

This course will be focussed on analyzing business model characteristics for Industry 4.0, providing an in-depth perspective of companies' processes, structures, and tools for business model innovation. The course will also provide insight in EU good practices and competencies for business model innovation in the course of Industry 4.0.