



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

DESIGN AUTOMATION OF CUSTOMIZED PRODUCTS USING KNOWLEDGE ENGINEERING  
[S5IMECH>APWZ]

### Course

Proposed by Discipline

–

Year/Semester

2/3

Level of study

Doctoral School

Course offered in

English

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

8

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

dr hab. inż. Filip Górski prof. PP  
filip.gorski@put.poznan.pl

### Lecturers

dr hab. inż. Filip Górski prof. PP  
filip.gorski@put.poznan.pl

### Prerequisites

Knowledge in scope of information technologies and technical drawing, CAD/CAM, manufacturing technologies. Social competences: cooperation in a project team, awareness of responsibility for assigned tasks, understanding the need for new knowledge.

### Course objective

Getting familiarized with techniques and methods of automated design of individualized industrial and medical products, with use of knowledge engineering and intelligent CAD models.

### Course-related learning outcomes

Knowledge

1. The student describes the design place in the modern design and construction process (P8S\_WG/SzD\_W01).
2. The student describes the possibilities of designing individualized industrial and medical devices using knowledge and reconstruction engineering techniques (P8S\_WG/SzD\_W02).
3. The student describes the possibilities of automating design of individualized products using knowledge engineering and CAD autogenerating models (P8S\_WG/SzD\_W02).

## Skills

1. The student uses knowledge engineering, CAD autogenerating models and reconstruction engineering techniques (P8S\_UW/SzD\_U01).

## Social competences

1. The student is open to the implementation of advanced CAD systems in engineering (P8S\_KK/SzD\_K03).  
2. The student is able to independently develop knowledge in the subject and critically evaluate the novelty and potential of design automation cases in various branches of mechanical engineering (P8S\_KK/SzD\_K01).

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Assessment based on the final pass - a study in the form of an essay and/or a final test - after obtaining at least 51% of points.

## Programme content

Customized products and their types. Knowledge engineering. Intelligent models and design automation systems. Examples of products.

## Course topics

- mass customization - the production of individualized products,
- types of customization, classification of individualized products, examples of products
- design of individualized products based on medical imaging techniques and 3D scanning,
- Design automation techniques - basics of KBBE (Knowledge Based Engineering) and autogenerating models in industrial and medical applications, with examples

## Teaching methods

- informative lecture
- multimedia presentation
- case study

## Bibliography

Górski, F. (2025). Computer Aided Design of 3D Printable Anatomically Shaped Medical Devices: Methodologies and Applications. CRC Press.

## Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	8	0,00
Doctoral student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation)	42	2,00