



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Simulation of production processes

Course

Field of study

Product Lifecycle Engineering

Area of study (specialization)

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

English

Requirements

elective

Number of hours

Lecture

10

Tutorials

Laboratory classes

10

Projects/seminars

10

Other (e.g. online)

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

Principles of production management and processes improvement. Principles of statistics.



Course objective

The objective of the course is to familiarize the students with application of simulation method to production processes with emphasis on processes improvement.

Course-related learning outcomes

Knowledge

Understanding of usage of simulation method for processes improvement. Knows stages of simulation study. Awareness of advantages and disadvantages of simulation method.

Skills

Simulation model building and its verification and validation. Input data analysis for simulation purposes. Design and conducting of simulation experiment. Output data analysis of stochastic simulation.

Social competences

Communication with specialists from the company (i.e. processes owners) in order to acquisition of data necessary for simulation. Presentation of simulation project outcomes for company managers.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: colloquium at the end of the course.

Laboratory: assessments of part of the work according to the simulation study stage.

Project: assessment of the project results.

Programme content

Lecture:

Introduction to simulation. Simulation as research method. Contextes of term "simulation". Types of simulation. Algorithm of discrete-event simulation. Stages of simulation study.

Problem formulation. Types of simulation models. Simulation model building. Verification and validation of simulation model.

Input data for production processes simulation. Statistical input data analysis for simulation purposes.

Design of simulation experiment.

Analysis of simulation output data.

Analysis of selected case studies.

Laboratory:

Algorithm of discrete-event simulation.

Model building, its verification and validation.



Input data analysis for simulation.

Output data analysis of stochastic simulation.

Design and conducting of factor experiment simulation.

Project:

Conducting of simulation project within student groups.

Teaching methods

Lecture with on-line examples. Laboratory. Project

Bibliography

Basic

Robinson, Simulation. The Practice of Model Development and Use, Wiley 2004.

Banks, Carson, Nelson, Nicol, Discrete-Event System Simulation, Prentice Hall, 2000.

Beaverstock, Greenwood, Nordgren, Applied Simulation. Modeling and Analysis using FlexSim, BookBaby, 2018.

Additional

FlexSim simulation software manual (on-line)

Materials from "Winter Simulation Conference" (sections: "Introductory Tutorials", "Manufacturing Applications")

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	20	1,0

¹ delete or add other activities as appropriate

