Tárgytematika / Course Description
Design of Virtual Instrument

GKNM_AUTA029

Tárgyfelelős neve / Teacher's name: Kovács Gergely
Félév / Semester: 2023/24/2
Beszámolási forma / Assesment: Vizsga
Tárgy heti óraszáma / Teaching hours(week): 2/0/1
Tárgy féléves óraszáma / Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

This course provides a comprehensive treatment of the virtual tool design process. The aim of the course is to introduce the student to the world of virtual tool design, to familiarise the student with the definitions and the general process of tool design. It will also familiarise the student with and provide a basic understanding of the use of virtual tool design software.

TANTÁRGY TARTALMA / DESCRIPTION

The student's obligations: The student must

• Keep up to date with course-related news during the semester, which is available on the course page of the szelearning.sze.hu system with the course name and code, • Enrol in the szelearning.sze.hu course no later than the end of the 2nd week of the course. (Enrolment is automatic, based on the Neptun roster. The student has to login once on the szelearning.sze.hu interface.)

Input requirement: The student is able to

• interpret basic concepts used in engineering practice,

• apply the basic knowledge acquired in a system thinking integrated way,

• independently process and link the elements of the learning core,

• use the basic functions of a computer and to install software independently. The student will be able to

• computer operation and programming basics. Knowledge of the input requirements is necessary for successful

completion of the course, but they are not taught within the course!

Education output: Upon successful completion of the course, the student will become a competent user of the following skills:

• They will learn the definitions, applications, and general process of virtual device design.

• They will gain a detailed understanding of the user interface and the operating environment of a virtual asset design software. Upon successful completion of the course, the student will be able to

• plan, organise and conduct independent learning,

• apply the acquired IT skills to tasks in their field of specialisation,

• construct basic models of technical systems and processes.

Methodological schedule for the semester:

• Project-based course, no classroom lectures.

• Consultation possible according to timetable (e-mail is preferred).

• 1 assignment to be submitted during the semester.

• During the semester, any information not covered in the course description will be available on the course page of the szelearning.sze.hu system.

• In cases not covered in the subject requirements, the study and examination regulations are the guiding document.

Content schedule:

1. Description of subject requirements

2. Basics of Simulation Modelling I.

3. Basics of Simulation Modelling II.

4. Simulation software environment

5. Basic management functions

6. Material flow objects

7. Moving units and their properties

8. Reporting

9. Resource management tools

10. Information flow objects

11. Multi-level models

12. Basic programming functions

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESMENT'S METHOD

Signature condition: Condition of signature

• Enrolment in the course at szelearning.sze.hu by the end of the 2nd week of the course at the latest.

• Deadline for uploading 1 assignment to be submitted during the semester.

Evaluation method:

• Grade offered: semester requirements (Signature) and assessment based on the assignment to be submitted.

• No exams. Plagiarism: a student commits plagiarism if he or she presents as his or her own, in whole or in part, the intellectual work of another. Plagiarism, especially in the case of written assignments, is against university policy and is not acceptable: a breach of academic integrity may result in expulsion from the course and disciplinary action.

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL

Recommended material:

• Szántó Norbert: Gyártási folyamatok és szimulációs technikák, Elektronic note, Széchenyi István Egyetem, Győr, 2019.

• Martijn R.K. Mes: Simulation Modelling using Practical Examples: A Plant Simulation Tutorial, Uni Twente, 2021.

• Markus Rabe, Sven Spieckermann, Sigrid Wenzel: Verifikation und Validierung für die Simulation in Produktion und Logistik, Springer, Berlin, 2008.

• Steffen Bangsow: Tecnomatix Plant Simulation, Springer, Berlin, 2016.

• Wallace J. Hopp, Mark L. Spearman: Factory Physics, McGraw-Hill, Boston, 2008.

• Introduction to LabVIEW, Six-Hour Course, National Instruments, 2003.

• Introduction to LabVIEW, 3-Hour Hands on Tutorial, National Instruments, 2012.