Tárgytematika / Course Description
Modern methodologies in structural engineering

EKNB_SETA092

Tárgyfelelős neve / Teacher's name: Ajtayné Dr. Károlyfi Kitti
Félév / Semester: 2023/24/2
Beszámolási forma / Assesment: Folyamatos számonkérés
Tárgy heti óraszáma / Teaching hours(week): 2/0/0
Tárgy féléves óraszáma / Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

The aim of the course is to familiarize students with innovative tools applicable in civil engineering practice. Through theoretical foundations, practical examples, and case studies, students will explore the fundamentals of 3D surveys, the possibilities of parametric design, 3D printing technologies, and applications of VR/AR and artificial intelligence.

TANTÁRGY TARTALMA / DESCRIPTION

Schedule of the course:

1.week	Introduction, overview of topics, discussion of homework

2.week	3D building survey - basics, theory, tools

3.week	3D building survey - practice

4.week	3D building survey - case studies, applications

5.week	Presentation of the 1. homework

6.week	Basics of parametric design, introduction to Rhino and

7. week	Parametric design practice: basics, 2D elements, transfo

8.week	Parametric design practice: creation of 3D objects, plan

9.week	Parametric design practice: data management, lists

10.week	Parametric design practice: connection with ConSteel’s

11.week	Parametric design practice: connection with AxisVM, str

12.week	Artificial intelligence and its application possibiliti

13.week	Presentation of the 2. homework

14.week	3D printing technologies, VR/AR technologies, case studd

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESMENT'S METHOD

During the semester, students will complete and present two project assignments. Each project task is worth a maximum of 100 points. The course grade is determined based on the total points as follows:

0-110 points: 1
110-129 points: 2
130-149 points: 3
150-169 points: 4
170-200 points: 5

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Vasilev Leonid: Parametric modeling in structural design, LAB University of Applied Sciences, 2020. Available at: https://www.theseus.fi/bitstream/handle/10024/349329/Parametricmodelinginstructuraldesign.pdf?sequence=2

Klaus Hanke, Perre Grussenmeyer: Architectural Photogrammetry: Basic theory, Procedures, Tools, Corfu, 2002, Available at: https://www.isprs.org/commission5/tutorial02/gruss/tut_gruss.pdf

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL

Anke Rolvink, Roel van de Straat, Jeroe Coenders: Parametric Structural Design and beyond, International Journal of Architectural Computing, Vol. 08 (03), pp. 319-336. Available at: https://papers.cumincad.org/data/works/att/ijac20108305.pdf

Izabela Skrzypczak, Grzegorz Oleniacz, Agnieszka Leśniak, Krzysztof Zima, Maria Mrówczyńska & Jan K. Kazak (2022) Scan-to-BIM method in construction: assessment of the 3D buildings model accuracy in terms inventory measurements, Building Research & Information, 50:8, 859-880, DOI: 10.1080/09613218.2021.2011703