

Tárgytematika / Course Description

Engineering computations of vehicle systems

AJNB_BMTA047

Tárgyfelelős neve /

Teacher's name: dr. Hanula Barna

Félév / Semester: 2021/22/2

Beszámolási forma /

Assesment: Folyamatos számonkérés

Tárgy heti óraszám /

Teaching hours(week): 0/2/0

Tárgy féléves óraszám /

Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

The course aims to provide essential programming skills in MATLAB which enable the students to solve different challenges in the engineering field.

TANTÁRGY TARTALMA / DESCRIPTION

Week 1.: Discussing the aim of the course and presenting engineering challenges in MATLAB

Week 2 – 3.: MATLAB Script – data structures, basic functions and 2D representation

Week 4 – 5.: MATLAB Function – matrix operations, handling and representing complex numbers, MATLAB functions

Week 6 – 7.: Data analysis and visualization – Importing datafiles, fft and 2D fft, displaying and evaluating results

Week 8.: Describing project tasks, formation of groups, choosing topics

Week 9 – 10.: Data analysis and visualization, reading complex datafiles, statistical analysis, regression

Week 11 – 14.: MATLAB Simulink – graphical programming, regulatory circuit modelling, application of GUI components

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

Besides active participation, to meet the fulfilment conditions of the subject, an assignment must be made and documented by the students.

Groups formed from students must elaborate a solution using MATLAB for one of the previously presented challenges during the semester.

The documentation must be written in English based on the following criteria:

- Description of the chosen topic
- Presenting the model for the solution of the challenge
- Presenting and explaining the MATLAB code behind the model
- Boundary conditions of examined cases
- Making a detailed comparison of the results of the different cases
- Examination of the applicability of the obtained results

The documentation of the results must be made in digital form, using the uploaded .docx template which can be found at the subject course in szelearning. Grades are determined on the basis of a professional evaluation of the submitted work.

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Recommended literature:

- Holly Moore, MATLAB for Engineers, Pearson Education Inc, 2018, ISBN: 978-0-13-458964
- Steven Chapra, Raymond Canale, Numerical Methods for Engineers, McGraw Hill, 2015, ISBN: 978-0-07-339792-4
- William J Palm III, Introduction to MATLAB for engineers, McGraw Hill, 2010, ISBN 978-0-07-353487-9