Tárgytematika / Course Description

Introduction to Finite Element Methods

GKNB_AMTA014

Tárgyfelelős neve / Teacher's name: dr. Pere Balázs

Félév / Semester: 2020/21/2

Beszámolási forma / Assesment: Folyamatos számonkérés

Tárgy heti óraszáma / Teaching hours(week): 2/2/0

Tárgy féléves óraszáma / Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

Computer simulations play an important role in the early phases of engineering design nowadays. These can be applied in

a wide range of problems in mechanics (structural analysis, dynamics, thermodynamics, etc.) and their common element

is, that they solve mathematical equations - which describing a certain physical phenomenon - via approximation. The

most widespread method of approximations is the Finite Element Method. In order to be able to use these methods, and to

generate reliable data with them, an engineer in training must become familiar with the underlying mathematical equations

solved, the modelling approaches, as well as the limitations of the methods.

TANTÁRGY TARTALMA / DESCRIPTION

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESMENT'S METHOD

Conditions for signature (to be fulfilled during the class-period and necessary for acquiring the mid-semester grade):
The **homework must be written and submitted until the deadline**. The homework will be marked on a scale of 0-20 points. Minimum 8 points shall be achieved on a homework.
Any homework written in LaTeX based text editors are worth additional max. 10 points.
A homework that was not submitted by the deadline can be submitted **within one week** after the deadline. The final deadline for the late submission of the homework is Sunday 23:59 of the last week of the class-period. These late submissions are subject to **extra process fee**. **If the homework was not submitted within one week after the deadline, then the semester cannot be validated and a signature will be refused.**

A homework that is not accepted shall be resubmitted again within one week of receipt.
A homework, which **does not fulfill the minimum requirements for the layout and content, will not be accepted**.
(Requirements for the layout and content can be downloaded from the homepage of the subject.)
?ś Those students, whose homework verifiably proves to be the work of a third party and referred to as their own work, will
be disqualified. In this case, the semester cannot be validated and signature will be refused as a consequence of their action.
Midterm tests:
?ś **Two times** in the semester (somewhen in the 6-7th and 12-13th weeks) **tests will be given** from the topics of the previous
lectures. Each tests are worth maximum 20 points and **valid only if at least 8 points** (40% of the 20 points) **are reached**.
?ś At the end of the semester **a problem must be solved with Finite Element software in a computer room**. The flawless solution **is worth 20 points but at least 8 points** (40% of the 20 points) **must be reached** for validity.
Mid-semester grade:
?ś The sum of the points of the homework, mid-term tests and the problem solved with computer determines the midsemester
mark. The grading is as follows
0-31 points fail (1)
32-42 points pass (2)
43-52 points satisfactory (3)
53-62 points good (4)
63-80 (or more) points excellent (5)
Students must provide proof of their identity with an official card (eg. ID card, passport, driving license, etc.) at the tests.
Those students, who apply unauthorized means (book, lecture notes, infocommunication means, tools for storing and forwarding electronic information, etc.) different from those listed in the course requirement or adopted by the lecturer in charge of the course assessment will be disqualified from the exam as a consequence of their action, and the exam mark will automatically become "Fail (1)".
Consultation:
Each lecturer will have one hour per week for consultation. Time and place will be determined according to the needs of students.

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Zienkierich, O. C., and L. R. Taylor. "The Basis". The Finite Element Method. Vol. 1. Butterworth - Heinemann, 2000.