

Α?

### MEC-E8003 - Beam, Plate and Shell Models D, Lecture, 25.2.2025-8.4.2025

This course space end date is set to 08.04.2025 **Search Courses: MEC-E8003** 

Assignments

External tools

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**Zoom Meetings** 

Course feedback

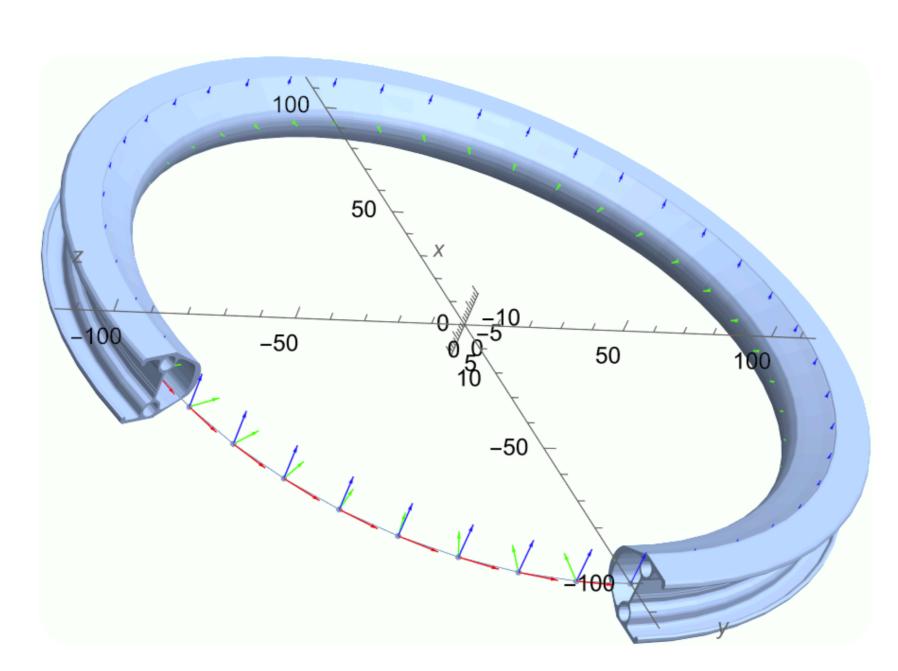
Department of Mechanical Engineering / MEC-E8003 - Beam, Plate and Shell Models D, Lecture, 25.2.2025-8.4.2025

Course

Grades

Course feedback

### MEC-E8003 Beam, Plate, and Shell Models D



After the course, student is (1) able to represent the quantities and operators of continuum mechanics in different coordinate systems, (2) knows the assumptions of the beam and plate models and derivation of the beam and plate equations using the principle of virtual work, and (3) is able to write the equations in different coordinate systems in flat and curved geometries and solve the equations for the displacements in simple cases.



#### **Announcements**



Course arrangements and schedule

**PDF** 

#### **TEACHING**

Responsible teacher: Jouni Freund (JF)

**Teacher:** Markku Malmivuori (MM)

**Lectures** on Tue (14:15-16:00) and Wed (14:15-16:00) are based on the lecture notes available in the homepage on Fri of the previous week. Lectures are recorded.

Exercise session on Thu (12:15-14:00) is a lecture on solving the weekly exercise problems by hand, with MathType, and FE-code of the course. Exercise sessions are recorded.

Calculation hours on Thu (14:15-16:00) is an informal meeting for instructions, discussion, and questions on the weekly assignments. Calculation hours are not recorded.

#### **COURSE MATERIAL**

Course material of each week is published in the home page on Fri of the previous week.

Lecture notes contains the theory and examples related with the weekly topic to be discussed on Tue and Wed.

**Example problems** of each week contain answers and full solutions. Some of the hand-calculation and/or Mathematica solutions are explained in detail during the Calculation examples lecture on Thu.

Assignments (1,2) are discussed during the last 30min of the Tue and Wed lectures and later on the same day during the Calculation hours session. The dead-line is the day of the lecture 23:55.

Assignments (3,4,5) of each week are discussed during the Calculation examples lecture and Calculation hours on

Thu. Some of the problems are structured and contain templates to be completed, some are non-structured to be

All assignments are published and available in doc and pdf versions in the home page only. With the doc version, you may use MathType equation editor to fill the missing parts of a structured assignment or write the full solution to a non-structured assignment. Return of the solution through MyCourses should be pdf in type. Also handwriting with a

paper printout (with pdf conversion in some manner) is accepted if the quality is good enough.

### **COURSE SOFTWARE**

**Calculation hours** on Tue and Wed use Zoom:

solved from scratch. The dead-line is Sun 23:55.

https://www.aalto.fi/en/services/zoom-quick-guide

Mathematica notebooks of the course require Mathematica software to work. Download Mathematica in good time (it may take a few days to get the license)

https://download.aalto.fi/index-en.html

### **FINAL EXAM (OPTIONS)**

Onsite exam (in Otaniemi campus) consists of five (5) problems from the set of solved example problems of the course material. In the onsite exam, you may use only the formula collection of the course. The time for the exam is 4h.

Online exam consist of four (4) problems published and returned through MyCourses in the same manner as the assignments of the course. The problems are not as "technical" ones as those of the onsite exam and they might also require a bit modelling. The time for the exam is 4h. In the online exam, you may use any material. However, you are supposed to solve the problems by yourself.

Solutions to the modelling assignment, home assignments, and lecture assignments are graded so that the maximal points correspond to one correctly solved exam problem in the final grading of the course. Participation in the final exam is possible only if the points from the assignments exceed half of the maximal points. You may participate the first exam after the course online or onsite. The later exams are onsite only!



# **Formulae**

Formula collection of the course (pdf and docx)



#### List of points (update 06.05.2025) PDF

PDF

Onsite exam 12.04.2022

Grading of assignments and exams



# Exam 08.04.2025 results

An example of the final exam with its grading criteria

Grading discussion session: Onsite: markku.malmivuori@aalto.fi Online: jouni.freund@aalto.fi

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# Aalto-yliopisto **Aalto-universitetet Aalto University**

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