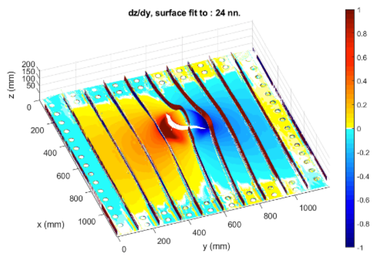
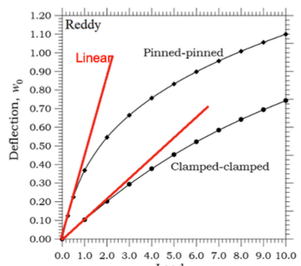
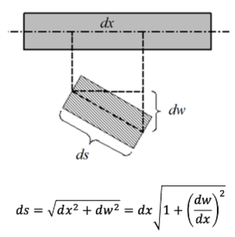
MEC-E8005 - Thin-walled Structures D, Lecture, 4.9.2023-11.10.2023

This course space end date is set to 11.10.2023 **Search Courses: MEC-E8005**

General







This on-line course aims to introduce the students to design and analysis of thin-walled structures. The course utilizes problem-based-learning concept so that the students are encouraged to work on application case they have selected (e.g. project from other course having a thin-walled structure as an application case), throughout the course. The aim of the course is to learn to analyze a thin-walled structure using the finite element method (FEM) for different limit states (serviceability, ultimate, fatigue and accidental). **For the learning it is of fundamental importance that each student is familiar with the theory and application of the FEM** (i.e. using some FE-code fluently). Students who do not have this prerequisite covered; it is recommended that the course is postponed. The course is intensive, and we will not provide support on basic usage of FE software(s). You can use your own software, or the codes Aalto offers (e.g. Ansys, Abaqus, FEMAP, Comsol).

The course is designed in the way that the video lectures, lecture notes and additional reading introduce you to the **theory** of thin-walled structures, and the mastering of the theory is evaluated by the **learning diary**, which is submitted by the end of week 7 as one submission. The learning will be reviewed by Turnitin for similarity and usage of AI (that is ethical usage of references and other sources of knowledge). The Turnitin score below 30% gives acceptable submission which will be graded. **The learning diary gives you 50% of the course grade**. The **group assignment** is designed to introduce the **practice** of the analysis and design of thin-walled structures. **The group work gives you another 50% of the course grade**. So, in short, each week (check left margin for details) we define a subtask to be solved, which is complemented with video lectures and lecture notes, 2 weekly question hours and supporting articles and references to certain text books for further information. Then the students will work on (personal and) group assignments and submit the group report for peer-review when completed. Within few days, the students receive for these report points and proposals for corrections that can raise the grade. The corrections are due within one week from the feedback. Then the corrected submission will be graded, and this grade contributes directly to the course grade.

The grading of personal and group works is described in detail in Assignments section. The strict grade boundaries are (no rounding applied):

<50%=0

50%=1

60%=2

70%=3

80%=4

90%=5

After the course, you can identify the requirements for numerical analysis of large complex, thin-walled structures in terms of physical understanding of the global structural static and vibratory response, load-transfer, materials; and in global and local approaches, i.e. homogenization and localization. **You can select** the structural modelling techniques for different analyses of relevant limit states such as: serviceability (static, vibratory), ultimate strength, fatigue strength and responses under accidental loads. The topics for different weeks are given in left-hand margin of the web page.

The course follows the Aalto Code of Conduct and principles of safe place for learning.

For any inquiries, please contact the course teacher jani.romanoff@aalto.fi

Announcements

Prerequisites check

Zoom-link for the Monday and Wednesday Question Hour(s)

Group choice chat-page To do