Aalto University
School of Engineering

MEC-E1070 Selection of Engineering Materials

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Lecture structure

First Half: (50')

Opening & review (10')

Course content studied from the textbook

Group discussion (40')

Task analysis, mutual feedback, questions collection discussion, self-assessment

Break (5')

Second Half: (55')

Group presentation (45' in total and every group 5-8 mins)

On the findings from the group discussion (at least one representative in each group)

Next task introduction (5')

Shape factor

Q&A (5')

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Lecture Review

Learning objectives for this Lecture

Knowledge and Understanding

Knowledge on graphical **trade-off methods** and **penalty functions**

Skills and Abilities

Ability to select systematically when **design objectives conflict**

Values and Attitudes

Appreciation of the value of compromise in engineering design

Resources

- Text: *"**Materials: engineering, science, processing and design**"* 4th edition by M.F. Ashby, H.R. Shercliff and D. Cebon, Butterworth Heinemann, Oxford, 2011, Chapters 7-8.
- Text: "**Materials and the Environment**", 2nd Edition by M.F. Ashby, Butterworth-Heinemann, Oxford 2012, UK. Chapters 9-10

Group discussion

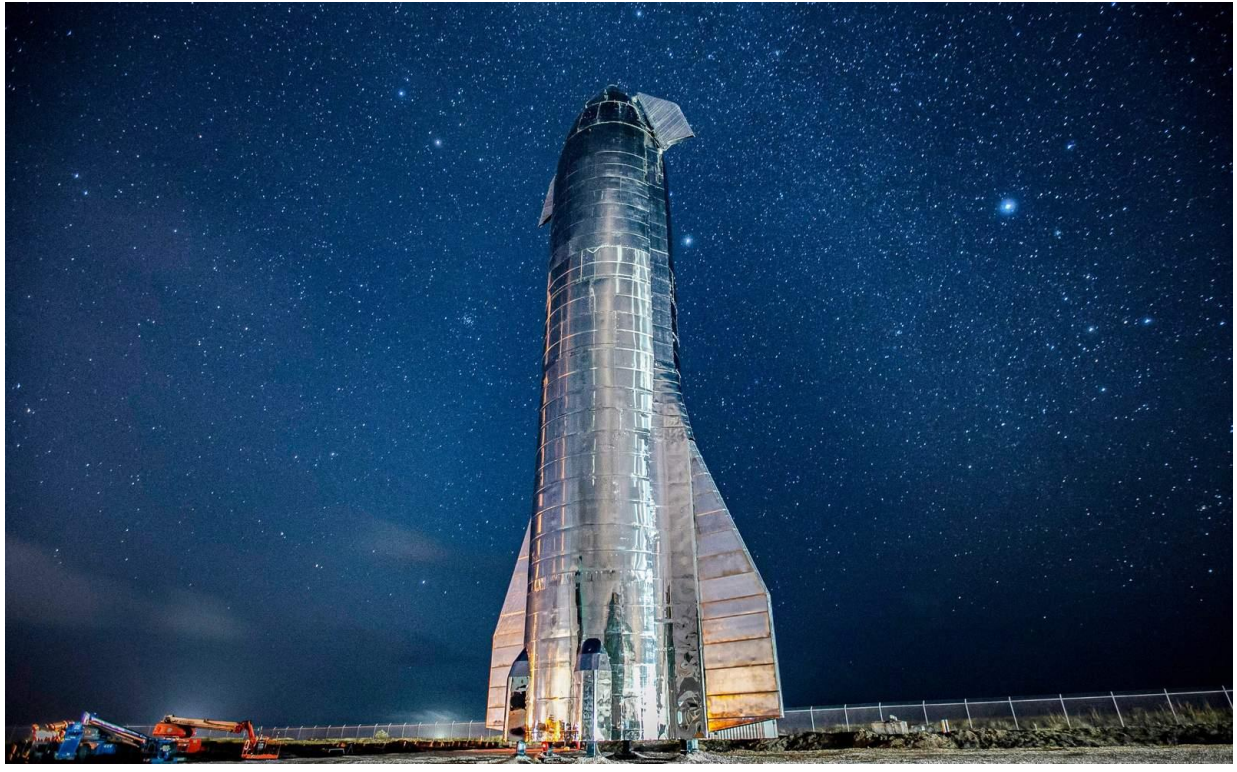
- Please try to turn on **camera** in group discussion
- **Moderator**: 3rd ranking {Birth month (day)}

- **Explain** your answers/analysis for each task;
- Give **feedback/assessment** to the results of your peers;
- Share your **questions/concerns** during the learning experience
- Self-assessment and peer-feedback to formulate a **perspective** on the learning outcomes
- Decide **persons/form** to present the findings from your group in the flipped classroom

Group presentation

- **Summarize** what has been discussed;
- **Reveal** what has been clarified during the mutual feedback and assessment;
- **Share** highlighted reports, answers, and plots from your group to the classroom;
- **Raise** still unclear points or questions to the flipped classroom for a general discussion.

Starship from SpaceX



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Task next week

Introduction to Task 3

Read chapters 9 and 10 (the 4th edition) of the course textbook.

The goal of the task is to understand:

- the meaning of **shape factors**, and consequently how to calculate them
- theoretical and practical considerations of how different shapes allow to use material efficiently
- how shape factors can be used to take the effect of shape into account in materials selection

Questions?

- Please avoid emails and use the forum on MyCourses!
- Detailed **Task 3** description will be open on **Friday afternoon**
- Report submission DL is **10:00 Next Friday**
- Finish the assessment of **Task 2** by the DL **18:00 on Next Monday**