Aalto University
School of Engineering

MEC-E1070 Selection of Engineering Materials

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Aalto University
School of Engineering

Important notice:

- *Please use your full name to enter the ZOOM session*
- *Registration on name list on-site*

Lecture structure

First Half (50')

Opening & review (10')

Course content studied from the textbook

Grouping (10')

Discussion topics and grouping

Group discussion (30')

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

Break (5')

Second Half (50')

Group presentation (45' in total and every group 15')

On the findings from the group discussion

Next task introduction (5')

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Lecture Review

Learning objectives for this Lecture

Knowledge and Understanding

Knowledge and understanding of the design process using **Material Indices**

Skills and Abilities

Ability to use GRANTA EduPack to apply **screening** and **ranking** to material properties

Values and Attitudes

Appreciation of design-led decision-making using GRANTA EduPack tools

Resources

- Text: *"**Materials Selection in Mechanical Design**",* 4th edition by M.F. Ashby, Butterworth Heinemann, Oxford, 2016, Chapters 3-5
- Text: *"**Materials: engineering, science, processing and design**"* 4th edition by M.F. Ashby, H.R. Shercliff and D. Cebon, Butterworth Heinemann, Oxford, 2019, Chapter 3, 4 and 5.

Group discussion & presentation

- Please turn on the **camera** in group discussion
- **Moderator**: Min. {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** present the findings from your group in the flipped classroom

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Task next week

Introduction to Task 2

Read chapters 7 and 8 (the 4th edition) of the course textbook.

The goal of the task is to understand:

- *the concept of solutions that dominate others when there are **multiple objectives**, and **trade-offs** when there are multiple un-dominated solutions*
- *how to combine multiple material indices into a **penalty function**, using a trade-off parameter*
- *how to graphically **represent** this on a chart with multiple indices as axes, and*
- *how to express this as relative performance compared to a reference solution*

Questions?

- Please avoid emails and use the forum on MyCourses!
- Detailed **Task 2** description will be open on **Friday afternoon**
- Report submission DL is **10:00 Next Friday**
- Finish the assessment of **Task 1** by the DL **18:00 on Next Monday**