

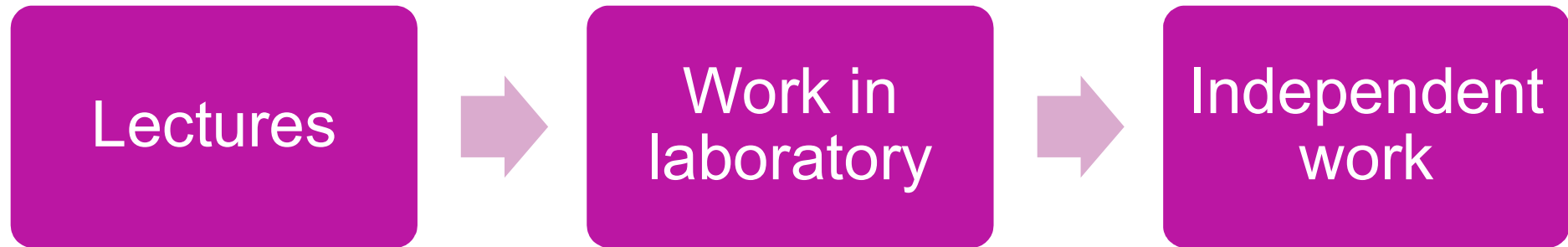


Aalto University
School of Engineering

MEC-E6006 Engineering Materials Laboratory

Info 2019

Course structure



Hall M232

- Introduction to lab works
- Students' presentations
- Discussions of results

K2 laboratory

- Guided/independent work

Home

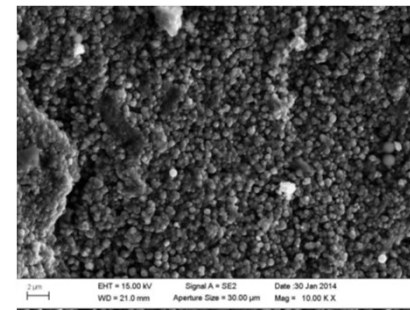
- Literature reviews
- Analysis of results
- Reporting

Assignments

- **Metallography basics**
 - sample preparation
 - optical microscopy and micrography
 - hardness measurement
- **Hardenability of steels**
 - hardenability test
 - microstructures and mechanisms in austenite decomposition and tempering of martensite
- **Stainless steels**
 - advanced sample preparation and microscopy
 - properties of stainless steels
- **Failure analysis**
 - examination of fracture surfaces
 - SEM and EDS



Fractured steam diffuser, material X35CrMo17 martensitic stainless steel

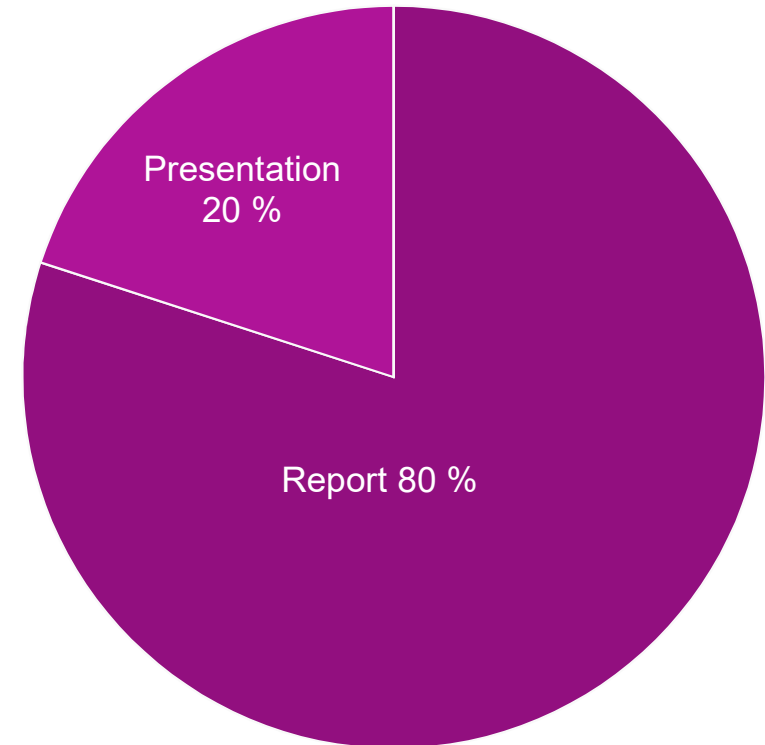


Fracture surface

Evaluation

- **Evaluation is based on reports and presentation**
 - quality of samples and micrographs
 - presentation of results
 - analysis and discussion
 - remember! there are no wrong results, they just need to be explained and discussed
- **Reporting in journal format**

Evaluation



Safety issues

- **Why?**
 - chemicals and hot furnaces are used in assignments
 - negligence and misuse cause dangerous situations
- **Read instructions carefully**
- **Before you start working be sure that it is safe**
- **Get the needed protective clothing (gloves, glasses and jacket)**
- **Find out location of safety equipment**
- **When confused, ask personnel, not from other students**
- **Don't work in the absence of lab personnel, or without permission**
- **Keep working area clean**
- **Don't bring food in laboratory**
- **Mark the bowls you are using (name, date, item)**
- **Use chemicals only in a fume cupboard**
- **Obey instructions and use common sense!**
- **In emergency situations call 112**
- **In minor cases inform personnel, or call AaltoAPUA 050 46 46 462**