

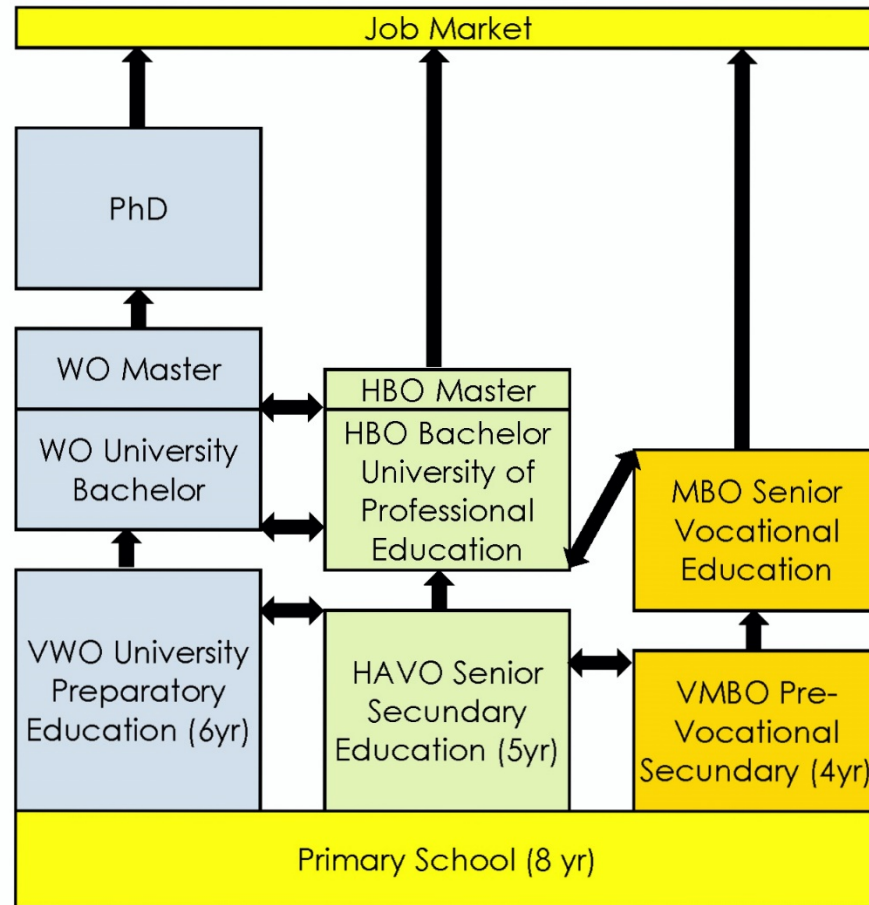


Materials Science in an Industrial Environment

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Dutch Education System



Post-Bachelor Courses

- Metallurgy (1yr)
- Audit and Inspection (I&K3) (2yr)
- International Welding Engineer (IWE)(2yr)



HU University of Applied Sciences

IWE Program (2 years)

Theory

- Welding processes and equipment
- Material behaviour during welding
- Design and construction
- Fabrication and applications

Experimental:

- Welding exercises(MIG, TIG, etc)
- Metallographic research and mechanical testing
- NDO techniques and applications



I&K3 Program (2 years)

- Legal requirements, audit systems, certifications (e.g. ISO)
- Materials Engineering
 - Mechanical testing
 - NDO
 - Fabrication and welding
- Inspection and Testing
- Quality control, Failure procedures



Post-HBO Course Metallurgy

Background participants:

- University MSc Engineering
- HBO MSc/BSc Engineering
- MBO4+

+ several years job
experience



Objectives



- Improve understanding of behaviour of metals
 - Relation processing-properties-microstructure
 - How to control properties
- Prevention of metal defects and failure
 - Fatigue, corrosion
- Direct use of obtained knowledge

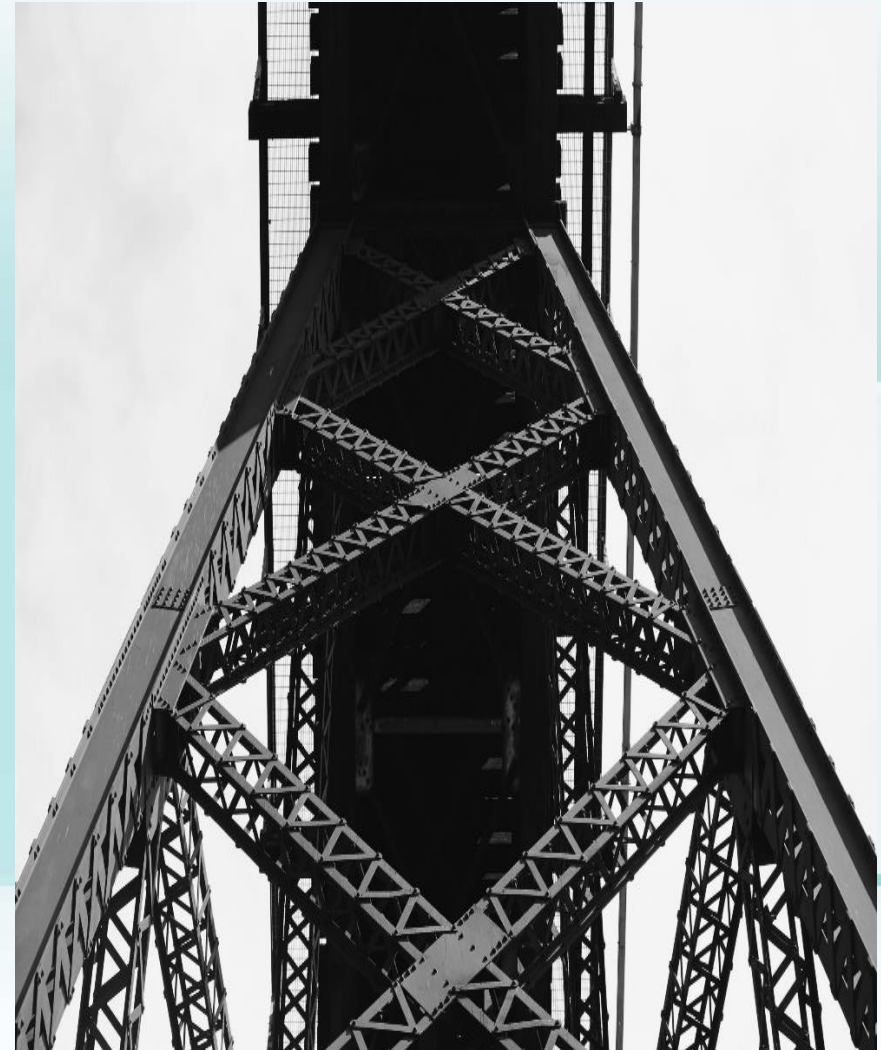
Obtained Competences

- Asks right questions on fabrication issues
- Checks if correct testing procedures are followed (corrosion, mechanical)
- Understands implications of modifying process conditions
- Applies relevant procedures and investigations for material failures



Metallurgy subjects:

- Physical Metallurgy
 - Phase diagrams
 - Phase Transformations
- Ferrous Metallurgy
 - Stainless steel applications
- Nonferrous Metallurgy
- Fabrication Technology
- Welding Technology
- Fracture Mechanics
- Testing methods
 - Physical methods (X-ray, SEM, TEM, etc)
 - Mechanical testing
 - NDO techniques
- Corrosion and corrosion prevention
 - Surface treatments
- Case studies
- Material Selection



Final presentation



Examples:

- Effect of deformation on ferrite content in duplex stainless steel
Determining the influence of metallic corrosion resistant cladded layer on fatigue resistance of forged carbon steel
- Erosion/corrosion of the P342A&B
- Deformation in gas turbines
- High temperature sulphur corrosion
- Rotor shaft bearing repair; material alternatives
- Effect of deformation on properties and performance of Aluminium EN AW 7020 for armour applications

Questions?

