



## KURSPLAN

# Applied Materials Technology, 7,5 högskolepoäng

## *Applied Materials Technology, 7.5 credits*

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<b>Kurskod:</b>	HMTK19	<b>Utbildningsnivå:</b>	Grundnivå
<b>Fastställd av:</b>	Utbildningsrådet 2018-11-06	<b>Utbildningsområde:</b>	Tekniska området
<b>Reviderad av:</b>	Utbildningsrådet 2019-05-14	<b>Ämnesgrupp:</b>	MT2
<b>Gäller fr.o.m.:</b>	2020-01-20	<b>Fördjupning:</b>	G1F
<b>Version:</b>	3	<b>Huvudområde:</b>	Ortopedteknik
<b>Diarienummer:</b>	Department of Rehabilitation		

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### Lärandemål

Upon completion of the course students should have the ability to:

#### Kunskap och förståelse

- explain central concepts and calculations in solid mechanics
- show familiarity with the relation between tension and elongation
- show familiarity with the use of elastic modulus, shear modulus, tensile strength and yield point
- explain the properties and material composition of plastic and composite materials
- show familiarity with different manufacturing methods and their respective possibilities and limitations.

#### Färdighet och förmåga

- calculate different conditions of tension and deformation
- decide correct dimension of structures based on information about strain and the linear mechanical properties of the material
- calculate and use safety factors
- discuss production methods based on information about demands on a product, volume of material and production in relation to sustainable development
- perform calculations on non-complex constructions.

#### Värderingsförmåga och förhållningssätt

- reflect on the environmental and personal health impact of materials
- show ability to evaluate if a solution is within reason.

### Innehåll

#### Solid mechanics

- constitutive relations of materials
- axles, torsion
- beams, cross section of beams, transverse force, diagram of momentum, stress
- stability and buckling, Euler Buckling
- fatigue limit, Haigh diagram

- beams, bending and equation of linear elasticity

Material science

- plastic, structures and properties
- composites, structures and properties
- metal, structures and properties
- construction and design, plastic and composite materials
- joining methods
- testing and analysis
- damage and material failure
- environmental aspects and recycling

### Undervisningsformer

The course is implemented through lectures, group work, seminars and laboratory sessions.

Undervisningen bedrivs på engelska.

### Förkunskapskrav

General entry requirements and completion of the course Mechanics related to Prosthetics and Orthotics, 7,5 credits.

### Examination och betyg

Kursen bedöms med betygen A, B, C, D, E, FX eller F.

Examination of the course will be based upon two written individual examinations.

A university lecturer serves as examiner for the course.

Poängregistrering av examinationen för kursen sker enligt följande system:

Examinationsmoment	Omfattning	Betyg
Solid Mechanics	4,5 hp	A/B/C/D/E/FX/F
Materials Science	3 hp	A/B/C/D/E/FX/F

### Övrigt

During the course attendance is compulsory during laboratory sessions and seminars.

### Kurslitteratur

Benhamn, P., Crawford, R., & Armstrong, C. (1996). *Mechanics of engineering materials*. Harlow: Longman.