KURSPLAN
Applied Materials Technology, 7,5 högskolepoäng

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

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.