COURSE SYLLABUS
Applied Materials Technology, 7.5 credits

Applied Materials Technology, 7,5 högskolepoäng

Course Code:	HMTK19	**Education Cycle:**	First-cycle level
Confirmed by:	Utbildningsrådet Nov 6, 2018	**Disciplinary domain:**	Technology
Revised by:	Utbildningsrådet May 14, 2019	**Subject group:**	MT2
Valid From:	Jan 20, 2020	**Specialised in:**	G1F
Version:	3	**Main field of study:**	Prosthetics and Orthotics
Reg number:	Department of Rehabilitation		

Intended Learning Outcomes (ILO)

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

Knowledge and understanding

- 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.

Skills and abilities

- 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.

Judgement and approach

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

Contents

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

Type of instruction

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

The teaching is conducted in English.

Prerequisites

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

Examination and grades

The course is graded A, B, C, D, E, FX or F.

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

A university lecturer serves as examiner for the course.

Registration of examination:

Name of the Test	Value	Grading
Solid Mechanics	4.5 credits	A/B/C/D/E/FX/F
Materials Science	3 credits	A/B/C/D/E/FX/F

Other information

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

Course literature

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