



Faculty of Health, Science and Technology
Mechanical Engineering

Syllabus

Mechanics 1: statics

Course Code:	MSGB42
Course Title:	Mechanics 1: statics <i>Mekanik 1: statik</i>
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has less than 60 credits in first-cycle course/s as entry requirements (G1F)

Major Field of Study:
MTA (Mechanical Engineering)

Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2018-02-01, and is valid from the Autumn semester 2018 at Karlstad University.

Prerequisites

Mathematics for engineers, 7.5 ECTS credits, or admission to study programmes TGHMT or TGHID.

Learning Outcomes

Upon the completion of this course, students should be able to:

- perform dimensional analysis,
- give an account of Newton's laws,
- give an account of basic concepts in classical mechanics such as concentrated and distributed force, resultant, moment, and couple,
- identify loading and analyze the corresponding static equilibrium,
- give an account of static analysis in simple structures,
- give an account of geometric and mass properties such as centroid, mass center, and area moment of inertia,
- give an account of internal forces in simple structures
- give an account of the concepts friction, mechanical work, kinetic energy, potential energy, power, degree of efficiency, and impact,
- give an account of the conservation laws of energy and momentum,
- analyze particle motion and make calculations of power, acceleration, velocity, and distance,
- identify loading and analyze the corresponding motion of a particle.

Content

- Dimensional analysis
- 2D and 3D force systems

- Equilibrium of a particle; Equilibrium of a rigid body
- Truss structures
- Centroid of line, area, volume; Center of gravity; Center of mass
- Area moment of inertia
- Distributed load; Internal forces in beams
- Dry friction
- Work and energy; Stability
- Dynamics of particles (Particle Kinematics, Particle Kinetics)

Instruction is in the form of lectures and calculation exercises.

Reading List

See separate document.

Examination

Assessment is based on hand-in assignments and a written exam.

Grades

One of the grades U (Fail), 3 (Pass), 4 (Pass with some distinction) or 5 (Pass with distinction) is awarded in the examination of the course.

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional information

The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.