



Faculty of Health, Science and Technology
Physics

Syllabus

Mechanics with applications 1

Course Code:	FYGA26
Course Title:	Mechanics with applications 1 <i>Mekanik med tillämpningar 1</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:

FYA (Physics)
MTA (Mechanical Engineering)
TKA (Engineering Physics)

Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2017-09-07, and is valid from the Spring semester 2018 at Karlstad University.

Prerequisites

Registration for courses MAGA60 Foundation course in Mathematics 7.5 ECTS cr, and MAGA52 Calculus and Geometry 7.5 ECTS cr., or equivalent.

Learning Outcomes

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

- give an account of basic concepts in mechanics and their relevance to different physical contexts,
- apply mathematical modelling of different relevant mechanical systems and their engineering applications to calculate relevant quantities in systems based on the formulated model,
- give an account of Newton's laws and derivations from these laws and apply these to the analysis of equilibrium problems of rigid bodies and systems of rigid bodies,
- apply Newton's laws and derivations from these laws to movements of particles, particle systems and rigid bodies,
- construct an idealised model of a concrete mechanical problem and perform validity and plausibility analysis of the constructed model and of the calculated quantities involved.

Content

Instruction is in the form of lectures and calculation exercises.

Statics: Forces and force systems in two and three dimensions, isolation of mechanical systems, Newton's first and third law, equilibrium in two and three dimensions, potential energy and stability.

Kinematics: Rectilinear and plane motion, constraints.

Dynamics: Newton's second law applied to rectilinear and curvilinear motion, work and energy, momentum and impulse, angular momentum.

Reading List

See separate document.

Examination

Assessment is based on 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.