



HÖGSKOLAN I GÄVLE

Applied Mechanics II 7.5 cr

Tillämpad mekanik II 7,5 hp

Set by Faculty of Engineering and Sustainable Development

Version

Set at

Valid from

10/11/13

HT2014

Level	G2F
Education level	First cycle
Course identifier	FYG500
Credits	7.5 cr
Main field of study	Physics
Subject group	Physics
Disciplinary domain	Natural sciences 100.0 %

Learning outcomes

After completing the course the student will be able to:

1. starting from a problem, make idealizations, with motivations a put up a mechanical model and with mathematical and numerical methods analyze the model for different parameter values, as well as interpret and critically evaluate the results
2. describe the differences between reality and the mathematical model, and understand the relationship between observations and model building
3. analyze the mathematical model using numerical and symbolic computing tools in order to effectively investigate and visualize the characteristics of the system
4. set up and solve advanced problems concerning three-dimensional mechanical structures
5. understand and calculate lattices in two and three dimensions
6. understand and perform shear force diagrams and torque charts for the calculation of beams
7. manage and calculate friction in elementary machine elements
8. solve problems of linear and angular momentum associated with rigid bodies
9. understand and explain gyroscopic forces.

Course content

Statics:

In-depth studies in advanced three-dimensional force systems

In-depth studies in advanced equilibrium equations in three dimensions
 Lattices in two and three dimensions
 Calculation of beams with force diagrams and torque charts
 Flexible cables
 Fluidal statics
 Application of friction in machine elements: wedge, screw, plate, flexible belt, rolling
 In-depth studies in virtual work

Dynamics:
 Kinematics and kinetics of rigid bodies
 Equations of motion
 Translation and rotation
 Relative acceleration
 Work, energy, momentum and angular momentum
 Gyroscopes and precession
 Vibrations in rigid bodies

Teaching	Lectures, tutorials and practicals. Instruction is also given in the form of demonstrations and supervision associated with lab assignments and exercises. Participation in the laboratory and associated instruction is compulsory.			
Prerequisites	Bachelor's degree with a major in Electrical Engineering, or Physics 30 credits and Mathematics 30 credits or equivalent.			
Examination	Written exam test and lab assignments.			
Grade	A, B, C, D, E, Fx, F			
Limitations	For each course a regular exam test and a re-examination are given.			
Other regulations	Criteria for final grade will be given at the beginning of the course.			
Sustainable environment	Content with sustainable development is not relevant to this course.			
Module	0010	Written examination	6 cr	Grade: AF
	0020	Laboratory Work	1.5 cr	Grade: UG