

SYLLABUS

Wind Power Technology 7.5 credits F7046T

Vindkraftsteknik

Course syllabus admitted: Autumn 2023 Sp 1 - Present

**DECISION DATE
2022-02-14**

Wind Power Technology 7.5 credits F7046T

Vindkraftsteknik

Second cycle, F7046T

Education level
Second cycle

Grade scale
G U 3 4 5

Subject
Energiteknik

Subject group (SCB)
Energy Technology

Entry requirements

M0013M Mathematics M, F0031T Hydromechanics. Goda kunskaper i engelska motsvarande Engelska 6.

Selection

The selection is based on 30-285 credits

Course Aim

After completing the course, the student will be able to

- Describe and explain the history of wind energy, its potential, opportunity, and consequences.
- Describe instrumentations used to characterize the wind.
- Apply methods to characterize and analyze wind measurements and estimate wind production (atmospheric boundary layer, turbulence, terrain effects, bin method, duration curve, statistical analysis)
- Describe, explain, and discuss different wind turbine concepts.
- Derive, analyze, and apply methods to characterize the aerodynamics of wind turbines (actuator disk theory, rotary disk theory, Betz limit, blade element momentum method, tip loss)
- Apply methods and analyze results to determine and design a wind turbine rotor.
- Apply methods and analyze results to characterize the dynamic of wind turbines (homogeneous and particular solution to dynamic systems, multi-degree of freedom systems, dynamic models of wind turbines)
- Develop the ability to collaborate with other people in a project and laboratory environment.
- Communicate results of calculation and experiments and present results obtained in written and oral form.

Contents

The course deals with basic methods for designing wind turbine and characterize their dynamic. In the course, students use the computer tool Matlab to dimension, represent and characterize a wind turbine.

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The teaching takes place in the form of lectures, lessons, laboratory work and eventual visit. Laboratory work is a compulsory part.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

Written exam with differentiated grades. For final grades, approved project and laboratory work is required. Exam: (3 Hp) Laboratory work: (1.5 Hp) Project: (3 Hp).

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term “unauthorized aids” refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Course offered by

Department of Engineering Sciences and Mathematics

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Laboratory work	U G#	1.5	Mandatory	A15	
0003	Project	U G#	3	Mandatory	A15	
0004	Written exam	G U 3 4 5	3	Mandatory	A21	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Niklas Lehto, Programme Director 2022-02-14

Syllabus established

by Mats Näsström 2015-02-12