



EJ2400 Electric Traction 6.0 credits

Elektrisk traktion

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Bachelor's degree (180 higher education credits), or equivalent qualifications. Documented proficiency in English corresponding to English B/ English 6.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After the examination the student should be able to:

- describe fundamental system issues in electric railway traction including running resistance, tractive effort, adhesion, power and energy consumption.
- calculate tractive effort, power, acceleration and velocity of rail vehicles
- describe different components of an electric traction vehicle and their for traction purposes important characteristics
- make estimations of voltages, currents and power of electrical drives for rail vehicles with induction motors or dc motors.
- be familiar with other types of electric drives for rail vehicles,
- describe the design of ac and dc power supplies for electric traction
- calculate the power capacity for different railway power supply systems
- Describe the background to electromagnetic interferences (EMI) in electric railway traction and define important concepts and parameters.

Course contents

Historical survey. General principles of electric traction and traction systems. Tractive and braking effort. Power requirements and energy consumption. Traction vehicles; electric drives, transformers and converters, control and mechanical transmission. Power supply systems; AC and DC supplies, power capacity, overhead catenary systems, overvoltages, line interferences and electromagnetic compatibility, EMC.

Disposition

24 h Lecture + 3 Assignments

Course literature

Östlund, S., Elektrisk Traktion KTH 2005

Examination

- INL1 - Assignment, 0.5 credits, grading scale: P, F
- INL2 - Assignment, 0.5 credits, grading scale: P, F
- TENA - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- INL3 - Assignment, 0.5 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.