Reg No: ELGB23/20261

Faculty of Health, Science and Technology
Electrical Engineering

Syllabus

Signals and Systems

Course Code:	ELGB23
Course Title:	Signals and Systems *Signaler och system*
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:
ETA (Electrical Engineering)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2025-01-22, and is valid from the Spring semester 2026 at Karlstad University.

Prerequisites
Registered for Digital Electronics, 7.5 ECTS credits, and Mathematics for Engineers III, 7.5 ECTS credits, or equivalent

Learning Outcomes
Upon completion of the course, students should be able to:
- give an account of the basic theory of continuous-time signals and systems
- apply the Fourier transform and the Laplace transform
- give an account of the sampling of continuous-time signals
- give an account of the basic theory of discrete-time signals and systems
- apply the Z-transform
- describe how poles and zeros affect the properties of a system
- describe signals and systems in the frequency domain
- perform basic calculations for filtering of continuous-time and discrete-time signals

- give an account of certain practical applications of signal processing.

Content
Basic theory of continuous-time signals and systems. Fourier transform and Laplace transform. Sampling. Basic theory of discrete-time signals and systems. Z-transformation. Transfer functions, poles, zeros, and stability. Spectral representation, frequency response, and Bode plot. Filtration. Examples of applications within electrical engineering.

Reading List
See separate document.

Examination
Assessment is based on a written exam, mandatory laboratory sessions, and lab reports.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades
One of the grades Distinction (VG), Pass (G), or Fail (U) is awarded in the examination of the course. Engineering students are awarded one of the grades 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass) or U (Fail) 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.