



Faculty of Health, Science and Technology
Electrical Engineering

Syllabus

Digital Electronics

Course Code: ELGA02

Course Title: Digital Electronics
Digitalteknik

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 2025-02-06, and is valid from the Spring semester 2026 at Karlstad University.

Prerequisites

Registered for Circuit analysis, 7.5 ECTS credits, or Circuit theory 1, 7.5 ECTS credits, or Electrical principles, 7.5 ECTS credits, or equivalent

Learning Outcomes

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

- give an account of the structure and electrical properties of the most common digital circuit families,
- use methods of analysis and synthesis for combinatorial nets and sequential nets,
- interface digital circuits to surrounding electronic systems, and
- handle and give an account of the functions of microcontrollers.

Content

Instruction is in the form of lectures, calculation exercises, and mandatory laboratory

sessions.

The course covers the following:

- digital circuit families and their characteristics
- combinatorial nets and special combinatorial circuits, Karnaugh diagram, latches and flip-flops
- synchronous and asynchronous sequential nets, iterative sequential nets, special sequential circuits
- semiconductor memories
- analogue/digital and digital/analogue converters, sample-and-hold circuits
- microcontrollers

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 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.