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Course Syllabus

Electrical Principles 7.5 Credits, First Cycle

Learning Outcomes

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

- explain the basic electrical laws for current and voltage.
- describe and use measurement methods for direct current (DC) and alternating current (AC) circuits.
- analyse and make calculations on DC and AC circuits.
- explain the characteristics of electronic components in DC and AC circuits.
- explain and use methods for sinusoidal alternating current.
- carry out investigations on DC and AC circuits both in the laboratory and in simulation programs.

Course Content

The first part of the course deals with Ohm's law for electrical conductors, Kirchhoff's laws for current and voltage in circuits, and basic measurement techniques for direct current circuits. Time dependent processes in direct current circuits are studied, and methods for the analysis of direct current and alternating current circuits are introduced. Further, alternating current and sinusoidal alternating current are treated. The function of various components in electrical circuits, such as resistors, capacitors, inductors and certain semiconductor elements, are covered. Methods of sinusoidal alternating current in electrical circuits are given in-depth coverage. Labs are an important feature of the course, and computer simulation is used to supplement physical labs.

Assessment

- Examination
- Laboratory report
- Assignment

Grades

The grading scale used for the final course grade is U, 3, 4, 5.

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Grades are reported as follows:

- Examination - 5 Credits | U, 3, 4, 5
- Laboratory Assignments - 2.0 Credits | U–G
- Written assignment - 0.5 Credits | U–G

Prerequisites
Single Variable Calculus 7.5 credits

Other Information
Replaces GET2K5.

This course cannot be counted towards the same degree along with courses that have equivalent content.

If the student has received a decision/recommendation granting study support from Dalarna University because of a disability, then the examiner has the right to offer an alternative examination arrangement. The examiner takes into account the objectives in the course syllabus when deciding whether the examination can be adapted in accordance with the decision/recommendation.

Subject:
Electrical Engineering

This course can be included in the following main field(s) of study:
1. No main field of study

Progression Indicator:
1. GXX

Approved:
Approved 3 October 2023
Valid from 28 November 2023