

Electric Circuits (Alternating Current)

Subject area: Electrical Engineering

University: DTU
Level: BA1, BA2, BA3
Teaching mode: hybrid: some students participate online, other students attend real-life
Instructor(s): Arnold Knott

Short description

Electric signals in alternating current circuitries in time and frequency domain, passive components in alternating current contexts, analog electrical circuits, transfer functions, and their applications (e.g. passive and active filters, amplifiers, motor drives, oscillator, power supplies)

Full description

<https://kurser.dtu.dk/course/34601>

Learning outcomes

A student who has met the objectives of the course will be able to:

Understanding of different notations and parameters of alternating currents, voltage and power

Apply basic Fourier series

Explain and apply decibel and bode plot

Explain basic physical principles behind passive components (resistors, inductors and capacitors)

Determine properties of passive circuits, such as impedances and power

Apply basic LaPlace transformations

Determine and analyse transfer functions

Analyse active alternating current circuitries

Link basic theoretical knowledge to practical applications

Demonstrate knowledge about technical terms also in English

Compare different simulation and measurement tools

Design solutions for realistic engineering problems

Recommended in particular for students of the following study programmes

electrical engineering, physics, space, environmental engineering, ... anyone highly interested

General information

Contact hours per week:	about 4 - online any time.
Total workload:	150 (in student hours for the whole course)
ECTS credits:	5
Language:	English
Course start date:	01 February 2023
Course end date:	03 May 2023
Add. info about start date:	
Weekly teaching day/time:	scheduled for Wednesday afternoon, but plenty of learning can be freely scheduled by the student
Time zone:	CET (Denmark, Germany, France, Netherlands, Switzerland, Czech Republic)
Further information:	<p>The course is fully developed for online/hybrid presentation and flexible study with full online support for the student.</p> <p>For remote students I plan to do a "summer camp": about 3 days on campus for the lab-exercises. For the rest fully online is possible. There will be online group work and online support in at least 3 languages: English, Danish & German.</p>
Prerequisites:	knowledge of complex numbers, knowledge of Ohms law and Kirchhoffs rules applied to resistors and direct current
Activities and methods:	Lectures, Group work, Lab-work, Self-study, Exercises
Presence on campus:	

Final examination

Form:	assignments and projects along the way
Date:	
Location/format:	no fixed location, but there are deadlines along the way during the course
Re-sit possibility:	no
Transcript available:	end of semester
Add. info/requirements:	about 5 homework and about 3 hand-ins

Registration

To register for this course, follow the registration requirements of your **home university** as specified here: www.euroteq.eu/courses-registration.

Administration

Number of places:	40
Minimum participants:	10
Internal course code:	34601
Contact:	knott@dtu.dk

This course is part of the EuroTeQ Engineering University joint course catalogue 2023. This is a collaborative activity of the partner universities DTU, L'X, TU/e, TalTech, CTU, TUM as well as Technion. Students from these universities can participate in the offered courses. It is the responsibility of the student to check if you fulfil the requirements to participate in a specific course. Students are also advised to check with their home institution how to get recognition of the ECTS credits gained in courses of the EuroTeQ course catalogue. For further information about EuroTeQ Engineering University, visit www.euroteq.eu or get in touch with the above-mentioned point of contact.