

t.ETEK1 - Elektrotechnik und Elektronik 1

Person responsible for the course: Mathis Nussberger, nusm

Credits: 4

Valid for: 2011/2012

Last saved: 10.02.2012 15:32

Learning objectives:

Students will understand the basics of electricity, i.e. the elementary laws governing the statical und dynamical behaviour of electrical systems. They can apply this knowledge in the field of aviation, especially in the case of avionics and power supply systems in aircrafts.

They know the elementary methods and processes for measuring electrical variables such as current, potential, energy flow and power in DC- and AC-systems. Furthermore they can design, execute and document simple tests and experiments. They can quantify and evaluate qualitatively the acquired data.

Course content:

- basic concepts (charge, current intensity, potential, tension, energy, power, dissipation)
- resistance, U-I characteristic, conductivity, temperature dependance
- laws of balance (Kirchhoff's laws, conservation of charge and energy and their application)
- two terminal networks (ideal sources, operating point, power matching), calculation of resistor networks
- linearity: principle of superposition and applications in battery backed DC-power supplies
- capacitors: capacity and ability to store energy, connecting capacitors
- electrostatical field: electrical forces, electrostatic induction, shielding
- digital technique (Boolean algebra, number representation, building blocks and circuits, truth tables)
- magnetostatics: magnetical field origin, ferromagnetism, magnetic forces (circuit breaker)
- magnetic flux, magnetic induction, inductivity, Lenz's law, AC-generator
- alternating current (AC), behaviour of coil and capacitor; real, reactive and apparent power
- transformer, AC motor, treephase or rotary current
- electronics: diodes, light-emitting diodes (LED), rectifiers, DC-generator

Previous knowledge:

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Teaching method:

Type of lesson:	Number of lessons per week:
Lecture	14x2L
Tutorial/Practicum	8x2L
Group teaching	
Block instruction	
Seminar	

Assessment:

According to the table or as specified in writing by the lecture at the beginning of the semester!

Number	Type	Weighting
1	End of term exam	2/3
1	Exam during the semester	1/9
2	Reports	1/9 for each report

Language of instruction:

Deutsch

Instruction material:

All documents related to this course can be found in the OLAT system.

Comments:

Lecturer may define changes to the assessment definitions given above in the introductory lesson.