Additional Links

Student Group

First Name	Surname	Matrikel Nr.

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1. physical values
2. introduction in structure of matter - electrical charge
    1. atoms
    2. electrical conductivity in metals
    3. electrical conductivity in semiconductors and isolators
    4. examples of conductive properties (gaseous, liquid, bulk)
3. effects of electrical current - thermal effects
    1. magnetic effects
    2. electromagnetic effects
    3. chemical effects
4. introduction in DC circuits - simple model for voltage and current
    1. technical direction of the current
    2. the electric circuit
    3. important circuit symbols
    4. ohm's law
    5. convention for assigning directional signs
    6. Kirchhoff voltage law (Kirchhoff law for meshes)
    7. divided circuit, parallel cicruit, conductance
    8. voltage divider
    9. simplification of networks
    10. superpositioning
    11. Thevenin's theorem (realistic electric sources)
    13. basic ciruits - example for series circuit: contact resistance given by (0) connection cable (ca. 10..20mOhm) (1) resistance of crimping, (2)resistance of contact body (e.g. with spring), (3) contact spring element (ca. 1mOhm). All three for male and female connector each
5. linear sources

- https://en.wikibooks.org/wiki/Electronics

You already know V-I-R and you not only connect AC/DC with music?
Great! Then you should Go one step further.
In this course we will investigate

- which ideal components are used in circuits and
- how they interact with each other and different types of current.

Introduction in Electrical Engineering 1
or: How to work with this course?

Direct Current Circuits

1 Preparation, Properties, Proportions
or: Watt is Power and Current?

2 Simple Circuits

or: about Branches and Stars

3 non-ideal Sources and two Terminal Networks
or: something lumpy with two Pins and why shortcircuits may be important

4 Network Analysis
Recipes for Networking

5 DC Circuit Transients
or: unfinite Charging

Alternating Current Circuits

6 Introduction in Alternating Current Technology
or: real and imaginary Parts

7 Circuits under different frequencies
or: Dampening the Output

old English exams

Additional Links

English

- Electrical Engineering - Fundamentals: A great, compact textbook covering about the same range as this course.
  (Use University VPN to get the textbook)
- Circuit Analysis and Design is a beautifully written and illustrated textbook with the same range of topics like this course.
  (It is also free to download - after filling in your data - and used in many US universities.)
- A great introductary script into electrical engineering can be found at LibreText - Physics II Thermodynamics, Electricity and Magnetism. The content ist originally from OpenStax and covers most of the parts of my course
- Another good introduction ist given by HyperPhysics

German

- Grundlagen der Elektrotechnik, This book covers the same level as the course. It covers ET1 and ET2. (German)

- Online Brückenkurs des KIT/Uni Stuttgart: Nice, partly animated online script, covering chapters 1, 2, 3 and 5 (German)
- H.Er.T.Z der HS Karlsruhe: The **H**ochschuloffene **E**lekt**r**o**t**echnik **Z**entrum of the Karlsruhe HS has a nice online script (German)
- LeifiPhysik: Here you can find further explanations of our chapters on vocational

school/gymnasium level. (German)

- simple club: simple club: explanatory videos on electrical engineering in the field of physics ; subscription not necessary!
- Elektrotechnik einfach erklärt: still few, but well developed videos
- Elektrotechnik in 5 Minuten: good fund of short videos

Excercises

- In addition to the H.Er.T.Z script (see above), there are further exercises.
- Further exercises will be distributed via ILIAS