HKA

2.1.2 Circuit Analysis 1

Circuit Analysis 1

Module Summary
Module code: EEIB120
Module coordinator: Prof. Dr. Rainer Merz
Credits (ECTS): 5 Points
Semester: 1. Semester
Pre-requisites with regard to content: Basical mathematical and physical knowledge
Pre-requisites according to the examination regulations: Regarding to the examination regulations no pre-requisites are required
Competencies: The participants learn how to analyze and calculate parameters of linear networks in respect to: Basics of electrical engineering   (ohms Law, Kirchhoff Rules)   • Electrical components with linear characteristics. Combinations of linear sources and components   • Methods to analyze linear circuits like Superposition and transformation of linear sources   • Basics and elementary circuits with operational amplifiers   • Collateral project   And understand how to combine linear parts and sub circuits in order to transfer the knowledge to circuits with more
Assessment: An exam with duration of 120 minutes will proof the theoretical knowledge and a technical preparation proofs the practical capability the practical
Usability: The Module Circuit Analysis gives the basics for electrical engineering, especially for the modules Circuit Analysis 2 und Electromagnetic.

Course: Circuit Analysis 1 (DC)
Module code: EEIB121
Lecturer: Prof. Dr. Rainer Merz
Scope of weekly semester hours (SWS): 3
Semester of delivery: Winter semester
Type/mode: Lecture, Compulsory subject
Language of instruction: English

Content:

- Basic knowledge about electrical fields and charges, electrical current, electrical voltages and electrical power. Active and passive components like resistors, current sources and voltage sources
- Kirchhoff's Equivalent linear voltage and current source und equivalent resistors
- Power matching
- Superposition
- Conductance Matrix
- Basic circuits with operational amplifiers

Recommended reading:

- A. Führer; K. Heidemann; W. Nerreter: Grundgebiete der Elektrotechnik 1: Stationäre Vorgänge, Hanser Verlag, 2012, 9. Auflage
- A. Führer; K. Heidemann; W. Nerreter: Grundgebiete der Elektrotechnik 2: Zeitabhängige Vorgänge, Hanser Verlag, 2011, 9. Auflage
- Wolff: Grundlagen der Elektrotechnik – Band 1, Das elektrische und das magnetische Feld, Wolff, Aachen 2003, 7. Auflage
- Frohne, H.; Löcherer, K.-H.; Müller, H.: Grundlagen der Elektrotechnik, Teubner, Stuttgart 2013, 23. Auflage
- Büttner, W.-E.: Grundlagen der Elektrotechnik 1, Oldenburg, München 2004

Course: Circuit Analysis Project 1
Module code: EEIB122
Lecturer: NN
Scope of weekly semester hours (SWS): 1
Semester of delivery: Winter semester
Type/mode: Excercise, Compulsory subject
Language of instruction: English
Content: Planning and description of a first self-made electrical circuit. Design of a circuit and calculation of parameters of needed parts Implementation a test of the circuit. Documentation
Recommended reading: • A. Führer; K. Heidemann; W. Nerreter: Grundgebiete der Elektrotechnik 1: Stationäre Vorgänge, Hanser Verlag, 2012, 9. Auflage • A. Führer; K. Heidemann; W. Nerreter: Grundgebiete der Elektrotechnik 2: Zeitabhängige Vorgänge, Hanser Verlag, 2011, 9. Auflage • Wolff: Grundlagen der Elektrotechnik – Band 1, Das elektrische und das magnetische Feld, Wolff, Aachen 2003, 7. Auflage • Frohne, H.; Löcherer, K.-H.; Müller, H.: Grundlagen der Elektrotechnik, Teubner, Stuttgart 2013, 23. Auflage • Büttner, W.-E.: Grundlagen der Elektrotechnik 1, Oldenburg, München 2004

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Module Handbook Bachelor Study Program Electrical Engineering and Information Technology

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- Tietze, U.; Schenk, Ch.; Gamm, E.: Halbleiter-Schaltungstechnik, Springer Verlag, Berlin, 2016, 15.Auflage