

Department	SciTec
Degree programme	SI
Module name	Electronic Hardware Systems
Module number	ET.2.904
Study and Examination Regulations	ER-version 41 (of 16.07.2021)
Compulsory/ compulsory optional/ optional module	compulsory optional module
Module coordinator	Prof. Dr. Burkart Voß, Oliver Reimer
Module content	<p><u>Part 1: Complex analogue hardware systems</u></p> <ul style="list-style-type: none"> ▪ analogue system design ▪ simulation methods and analysis of electronic circuits <p><u>Part 2: Complex digital hardware systems</u></p> <ul style="list-style-type: none"> ▪ methodologies for the design of complex electronic systems; ▪ concepts of hardware modelling and the design flow based on hardware description languages including special concepts of behavioural modelling of heterogeneous systems; ▪ high-level synthesis and modelling according to abstraction levels and verification
Learning objectives	<p><u>Part 1: Complex analogue hardware systems</u></p> <p>At the end of the module students are able to design electronic circuits with respect to practical requirement.</p> <p>The students will know the most common simulation methods of electronic circuits as there are Transient Analysis, DC-Analysis and Frequency Analysis and they have practical experience with simulation software.</p> <p><u>Part 2: Complex digital hardware systems</u></p> <p>At the end of the module students are able to create models of complex electronic systems with respect to the levels of abstraction of the Y-diagram of Gajski and Kuhn. The students understand the main concepts of modelling hardware based on hardware description languages.</p> <p>The students remember the specifics of complex electronic hardware systems as well as the general requirements, and they remember the design flow starting from a more abstract behavioural description down to the circuit topology</p>
Course type (lecture, seminar, exercises, practical course)	3 L – 0 S – 0 E – 1 P
Recommended literature	<ul style="list-style-type: none"> ▪ Dennis Fitzpatrick: Analog Design and Simulation Using Orcad Capture and PSPICE, Newnes, 2017 ▪ P. Marwedel: Embedded System Design. Springer Verlag, 2011 ▪ D. Gajski et al: Specifications and Design of Embedded Systems. Addison Wesley, 1994
Learning materials	Lecture notes, examples
Method(s) of instruction/ media being used	Talk, case study, lectures, interactive tutorials/ practical courses
Level/ category	Master (category: 2)
Which semester (winter/ summer term)	winter term
Which semester during the programme	1
Requirements for attendance, necessary knowledge	none
Assessment (written/ oral test, paper, etc.)	written examination (90 minutes), course achievement: successful attendance of practical course
ECTS credits	6
Work load in:	180 h of total work load, therefrom <ul style="list-style-type: none"> ▪ 60 h of presence at university ▪ 120 h of self-study
Usability of this module	Master thesis
Frequency of offer	Every study year
Duration of module	1 semester
Place/ room	Ernst-Abbe-Hochschule Jena - University of Applied Sciences Jena
Time	According to schedule
Language(s)	English