Modul **Embedded Drive Systems**					Abk. **EDS**
Studiensem. **2**	Regelstudiensem. **4**	Turnus **SS**	Dauer **1 Semester**	SWS **3**	ECTS-Punkte **4**

Modulverantwortliche/r Prof. Dr.-Ing. Matthias Nienhaus

Dozent/inn/en Dr.-Ing. Emanuele Grasso

Zuordnung zum Curriculum **Systems Engineering Master, Wahlbereich**

Zulassungsvoraussetzungen No formal pre-assumptions

Leistungskontrollen / Prüfungen Oral examination with grade

Lehrveranstaltungen / SWS Lecture: 2 SWS
Excercise: 1 SWS

Arbeitsaufwand

Lecture Time 15 Weeks per 2 SWS	30 h
Excercise Time 15 Weeks per 1 SWS	15 h
Pre- and post-preparation for Lecture and Excercise	45 h
Exam preparation	30 h
Total	120 h (4 CP)

Modulnote Grade

Lernziele/Kompetenzen

This lecture is intended to provide an insight into the field of embedded systems for engineering applications with particular focus on motor drive technology and sensorless techniques. After a thorough introduction on the conversion between continuous and discrete time domains for linear and non-linear systems, the students will receive an insight on modern microcontrollers and their structures as well as on power stages for motor drives. Field Oriented Control for brushless drives and an overview on sensorless techniques will be presented with particular attention on implementation issues.

Inhalt

- Overview on continuous and discrete time systems
- Sampling techniques
- Discretization of linear ODEs (ordinary differential equations)
- Discretization of non-linear ODEs (Runge-Kutta methods)
- Modern Microcontrollers – Structure and main functionalities
- Power stages – Linear and Switching technologies
- Basics of PCB design
- Field Oriented Control for brushless electrical drives
- Overview on sensorless techniques for brushless electrical drives

Weitere Informationen
Unterrichtssprache: english