



Controlled AC Drives /Geregelte Drehstromantriebe in summer term 2023

We are pleased to inform you that the lecture Controlled AC Drives (Geregelte Drehstromantriebe) will take place again in the upcoming summer semester of 2023. However, there will be some changes of the structure:

- The lectures will be given by **Prof. J. Böcker** and are offered in a concentrated format on
 - Tuesdays (starting at 14:00, two to three lecture units) and the following
 - Wednesdays (starting at 11:00, two lecture units).There will be 3 or 4 of such concentrated units, with the first one taking place on April 18/19.
- Exercises will be scheduled between these concentrated lecture sessions.
- The exam will take place in written form.

The lecture will only take place with an adequate number of students. However, the teaching assignment is still subject to approval.

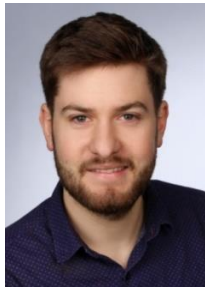
Furthermore, we will provide the opportunity to take part in a practical tutorial with real laboratory testbenches. Here, we will apply the studied drive control strategies to electrical drives to gain some insights into real-world applications.

Sincerely,

The teaching staff:



Joachim Böcker



Anian Brosch



Lukas Hölsch



Mario Peña

Description of the course:

The course introduces the principle of flux-oriented control of three-phase AC motors, which is today's standard of electrical drives in industry. Unlike the course of the bachelor's program focus is put on the dynamics behavior and on the control structures. As most important examples, the permanent magnet synchronous motor and the induction motor are treated.

Info and
Lecture notes



Contents:

- AC drives: Synchronous and induction motor (structure, basic physical effects, modeling, equivalent circuit diagrams, characteristic curves, operation areas)
- Speed and torque control
- Space vector theory (fundamental wave, coordinate transformation)
- Principles of flux-oriented control
- Closed-loop control of current, torque and speed, design methods
- Direct torque control (DTC)
- Observers
- Applications in industry, road and rail vehicles

Domain competence:

- The students will understand the most important types of AC drives, their properties and should be able to select and to design such drives by themselves.

Key qualifications:

- The students learn to transfer the learned skills also to other disciplines,
- extend their cooperation and team capabilities as well as the presentation skills in the context of solving the exercises,
- learn strategies to acquire knowledge from literature and internet

