

EE-565

Industrial electronics II

Dujic Drazen

Cursus	Sem.	Type
Electrical and Electronical Engineering	MA2, MA4	Opt.
Energy Management and Sustainability	MA2, MA4	Opt.
Energy minor	E	Opt.
Mineur STAS Chine	E	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	Oral
Workload	120h
Weeks	14
Hours	4 weekly
Courses	2 weekly
TP	2 weekly
Number of positions	

Summary

The control aspects bounded to power electronic systems will be presented. Students will learn modeling of power circuits and control functions, together with modeling of electrical machines, also grid connected systems.

Content**Introduction**

Modeling of three-phase systems with phasors in the stationary and rotating reference frames, structural diagram in the rotating reference frame. Complex transfer function, decoupling, poles of complex transfer function.

Vector control

Vector control of a three phase current system. Simulation in the stationary and rotating reference frame (computer simulation with SIMULINK). Control of three phase current with decoupling, state-space control.

Modeling and control of AC machines

Modeling with space-phasors of asynchronous motor. Indirect flux control with voltage control. Flux control with cascade of stator current field oriented control. Direct torque control with sliding mode. Modeling and control of a synchronous motor.

Learning Prerequisites**Required courses**

Industrial electronics I

Learning Outcomes

By the end of the course, the student must be able to:

- Design a vector control system
- Conceive a control strategy for an electric machine
- Conceive a control for a converter connected to the grid