Introduction to the Lecture

Daniel T. McGuiness, PhD

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MCI

M.Sc Drive Systems Laboratory

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- Warning: This is the content only covered by me as this lecture is shared by both me and Prof. Bernhard Hollaus, Ph.D.
- The goal of this lecture is to introduce to you the interesting world of machine control with the use of experimental methods. The student will apply control methods to motor by using embedded devices and analyse experimental results with simulations. The structure for this lecture is as follows.
- This lecture is a total of 1 SWS with a total of fifteen (15) UE.
- A unit (UE) is defined as 45 min lecture.

Introduction

- Lecture materials and all possible supplements will be present in its Github Repo.
  - You can easily access the link to the web-page from here.

> Github is chosen for easy access to material management and CI/CD capabilities and allowing hosting websites.

- In the lecture some exercises are solved using programming and can be accessed from the Repo website.

Introduction

- The student should be comfortable with working in an electrical laboratory and have practical experience working with MATLAB and SIMULINK along with basic knowledge using the C programming language.
- For a revision on some of these topics plase look at the following repos:
- M.Sc Drive Systems
- B.Sc Drive Technology

Requirements	Taught Lecture	Code	Degree	Outcome
C/C++ Programming	Programming II	PRO2	B.Sc	Fourier Analysis
Integral Calculus	Higher Mathematics I	HMA	M.Sc	Programming
Solid-State Motors	Drive Systems	ATS	M.Sc	Practical Experience
Differential Calculus	Higher Mathematics I	HMA	M.Sc	Control Analysis
Poly-phase Circuits	Drive Technology	ANT	B.Sc	-

Table 1: Distribution of materials across the semester.

Introduction

Description	Value
Official Name	Antriebssysteme Labor
Lecture Code	ATS
Module Code	MECH-M-2-ATS-ATS-LB
Degree	M.Sc
Semester	2
Season	SS
Lecturer(s)	Daniel T. McGuiness, Ph.D, Prof. Bernhard Hollaus, Ph.D
Module Responsible	DaM
Software	Simulink, MATLAB
SWS Total	1
UE Total	15
ECTS	2

Table 2: Information regarding the lecture.

Introduction

- As this lecture is experiment based, the student is required to produce a lab report, to be uploaded to SAKAI, showcasing all the requirement as dictated by the Laboratory Manual.

Assignment Type	Value
Laboratory Report	100
SUM	100

Table 3: Distribution of materials across the semester.

Title
Advanced electric drives: analysis control and modeling using MATLAB/Simulink
Analysis of electric machinery and drive systems
Design of rotating electrical machines
Electric Machinery Fundamentals (5th Edition)
Electric Machinery.
Electric Motors and Drives: Fundamentals Types and Applications
Electrical Machines and Drives: Fundamentals and Advanced Modelling
Electrical machines, drives, and power systems
Fundamentals of Electrical Drives

Table 4: Lecture sources which can be useful during the course of the lecture. For more information on sources, please consult the repo.

Topic	Units	Self Study
Measurement Board	3	8
BLDC Control with Sensors	4	8
Sensorless BLDC Control	4	8
Sensorless FOC of PMSM	4	8
Sum	15	32

Table 5: Distribution of materials across the semester.