

Introduction to the Lecture

Daniel T. McGuiness, PhD

Version: ϵ .2024.WS

MCI



M.Sc Electrodynamics



1. Introduction

Introduction



First Steps

Introduction

Lecture Contents

Requirement and Learning Outcomes

Assignments

Lecture Sources

Content Preview



- The goal of this lecture is to introduce you to the physical foundation governing all thing electrical and magnetics.
- Through the eyes of an engineer we shall look at different magnetic and electric event and using these effects, utilise the most out of materials.

The structure for this lecture is as follows.

- This lecture is a total of 2 SWS with a total of thirty (30) UE.
- A unit (UE) is defined as 45 min lecture.



- 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](#).



- The student should be comfortable with working with physical problems and have a basic understanding of material science along with calculus.

Requirements	Taught Lecture	Code	Degree	Outcome
Vector Calculus	Mathematik 1	MAT	B.Sc	Advanced Vector Calculus
Differential Calculus	Mathematik 2	MAT	B.Sc	Electrostatics
Linear Algebra	Mathematik 1	MAT	B.Sc	Magnetostatics
Physics	Physik	PHY		Electrodynamics
-				Electromagnetic Waves

Table 1: Distribution of materials across the semester.



Description	Value
Official Name	Elektrodynamik
Lecture Code	EDY
Module Code	MECH-M-1-EDY-EDY-VO
Degree	M.Sc
Lecture Name	Higher Mathematics II
Semester	1
Season	WS
Assignments	
Lecturer	Daniel T. McGuiness, Ph.D
Module Responsible	DaM
Software	Python
SWS Total	2
UE Total	0
ECTS	3

Table 2: Information regarding the lecture.



- The lecture will have a single personal assignment comprising of a set list of questions and a final exam comprising of all the topics covered in the lecture.
- For the written exam you are allowed to write your own equation reference paper, as long as it is a single sheet of A4, double sided and contains no exercise or solutions.

Assignment Type	Value
Personal Assignment	40
Final Exam	60
SUM	100

Table 3: Distribution of materials across the semester.



Title
A modern introduction to classical electrodynamics
Introduction to Electrodynamics (4th Edition)
Field and Wave Electromagnetics

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
Electrostatics	4	8
Advanced Mathematical Methods	4	8
Electric Fields in Matter	2	4
Magnetostatics	4	8
Magnetic Fields in Matter	2	4
Electrodynamics	4	8
Electrodynamics Waves	4	8
Radiation	4	8
Final Exam	2	4
Sum	30	60

Table 5: Distribution of materials across the semester.