

Topics on Fundamental Science

# **M.Sc Electrodynamics**

## **Introduction to the Lecture**

### **LectureSlide**

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2025.WS





## 1. Introduction

# Introduction

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- 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 events and using these effects, utilise the most out of materials.
- 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 content is also distributed as a WebBook which 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
Lecture Name	Electrodynamics
Semester	1
Season	WS
Lecturer	Daniel T. McGuiness, Ph.D
Module Responsible	DaM
Software	Python
SWS Total	2
UE Total	30
ECTS	3
Working Language	English





- 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



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

**Table 2:** 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
The Purpose of Electromagnetism	4	8
Vector Calculus	4	8
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
Final Exam	2	4



Topic	Units	Self Study
SUM	30	60