Introduction to the Lecture

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MCI

M.Sc Higher Mathematics II

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- The goal of this lecture is to improve what has been taught at M.Sc Higher Mathematics I and start working on engineering problem where there are more than one variable.
- The lecture will focus on mathematical concepts which will have direct usage with real life engineering applications. The structure for this lecture is as follows.
- This lecture is a total of 3 SWS with a total of thirty (45) UE.
  - With 45 UE is devoted to lectures.

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 with ordinary differential equations and have a good background in calculus.
- For a refreshment on its content the students are encouraged to read the materials presented in the following repos:
- M.Sc Higher Mathematics I

Requirements	Taught Lecture	Code	Degree	Outcome
Laplace Transform	Higher Mathematics I	HMA	M.Sc	Fourier Analysis
Integral Calculus	Higher Mathematics I	HMA	M.Sc	Solving PDEs
Vector Calculus	Higher Mathematics I	HMA	M.Sc	Statistical Analysis
Differential Calculus	Higher Mathematics I	HMA	M.Sc	Probabilistic Methods
-				Complex Analysis

Table 1: Distribution of materials across the semester.

Description	Value
Official Name	Höhere Mathematik 2
Lecture Code	HMA
Module Code	MECH-M-2-HMA-HMA-ILV
Degree	M.Sc
Lecture Name	Higher Mathematics II
Semester	2
Season	SS
Assignments	Personal Assignment Final Exam
Lecturer	Daniel T. McGuiness, Ph.D
Module Responsible	DaM
Software	Python*
SWS Total	3
UE Total	0
ECTS	4

Table 2: Information regarding the lecture.

Introduction

- 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
Thomas Calculus (12th Edition)
Probability: A Graduate Course
Partial Differential Equations of Mathematical Physics
Partial Differential Equations - An Introduction
Probability and Statistics for Engineers & Scientists
Mathematical Methods in the Physical Sciences (3rd Edition)
Mathematical Methods for Physics and Engineering (3rd Edition)
Differential Equations with Applications and Historical Notes (3rd Edition)
Advanced Engineering Calculus (9th Edition)
Applied Statistics and Probability for Engineers (3rd Edition)
A Students Guide to Fourier Transform
Mathematics of Diffusion
Partial Differential Equations in Physics
Probability and Stochastics
Random Walks in Biology

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

- The content and unit distribution of the lecture is as follows where a unit is defined as 45 min lecture.

Topic	Units	Self Study
Theory of Probability	12	24
Fourier Analysis	12	24
Partial Differential Equations	12	24
Complex Numbers and Calculations	9	18
Sum	45	90

Table 5: Distribution of materials across the semester.