Introduction to the Lecture

Daniel T. McGuiness, PhD

Version: η.SS.2025

MCI

B.Sc Data Science I

Table of Contents

Introduction

Table of Contents

First Steps

Introduction

- **Warning:** This is the content only covered by me as this lecture is shared by both me and Dr. Julian Huber.

- The goal of this lecture is to give you a working understanding of data analysis and give you the practical mathematical knowledge for use in Data Science II and future lectures/applications.

- While some parts will be done with pen and paper we will work with python for solving some applications as lecture goes on. The structure for this lecture is as follows.

- This lecture is a total of 4 SWS with a total of sixty (60) 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 python and have a good background with mathematics.

- For a revision on some of these topics plase look at the following repos:

- B.Sc Python for Engineering and Economics

Requirements	Taught Lecture	Code	Degree	Outcome
Python Python	Programming I	PRG I	B.Sc	Probability
Linear Algebra	Mathematics I	MAT I	B.Sc	Statistics
-	-	-	-	Data Engineering
-	-	-	-	-
-	-	-	-	-

Table 1: Distribution of materials across the semester.

Description	Value
Official Name	Machine Learning & Data Science 1
Lecture Code	MLDS
Module Code	MECH-B-4-MLDS-MLDS1-ILV
Degree	B.Sc
Lecture Name	Data Science I
Semester	4
Season	SS
Assignments	HW 1 HW 2 HW 3
Lecturer	Daniel T. McGuiness, Ph.D
Module Responsible	BnM
Software	Python
SWS Total	4
UE Total	0
ECTS	5

Table 2: Information regarding the lecture.

- This part of Data Science I will be %100 assignments based as there will be three (3) assignments where you need to solve given questions using python programming language and/or standard pen and paper.

Assignment Type	Value
HW 1	30
HW 2	30
HW 3	40
SUM	100

Table 3: Distribution of materials across the semester.

Title
Probability: A Graduate Course
Probability and Statistics for Engineers & Scientists
Differential Equations with Applications and Historical Notes (3rd Edition)
Applied Statistics and Probability for Engineers (3rd Edition)

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
Theory of Probability - I	4	8
Theory of Probability - II	2	4
Statistics - I	4	8
Statistics - II	2	4
Data Cleaning - I	4	8
Data Cleaning - II	2	4
Classification - I	2	4
Classification - II	4	8
Regression - I	4	8
Regression - II	2	4
Sum	30	60

Table 5: Distribution of materials across the semester.