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Data Science

Course Introduction

Prof. Gheith Abandah
أ.د. غيث علي عبدة

Outline

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Instructor Information

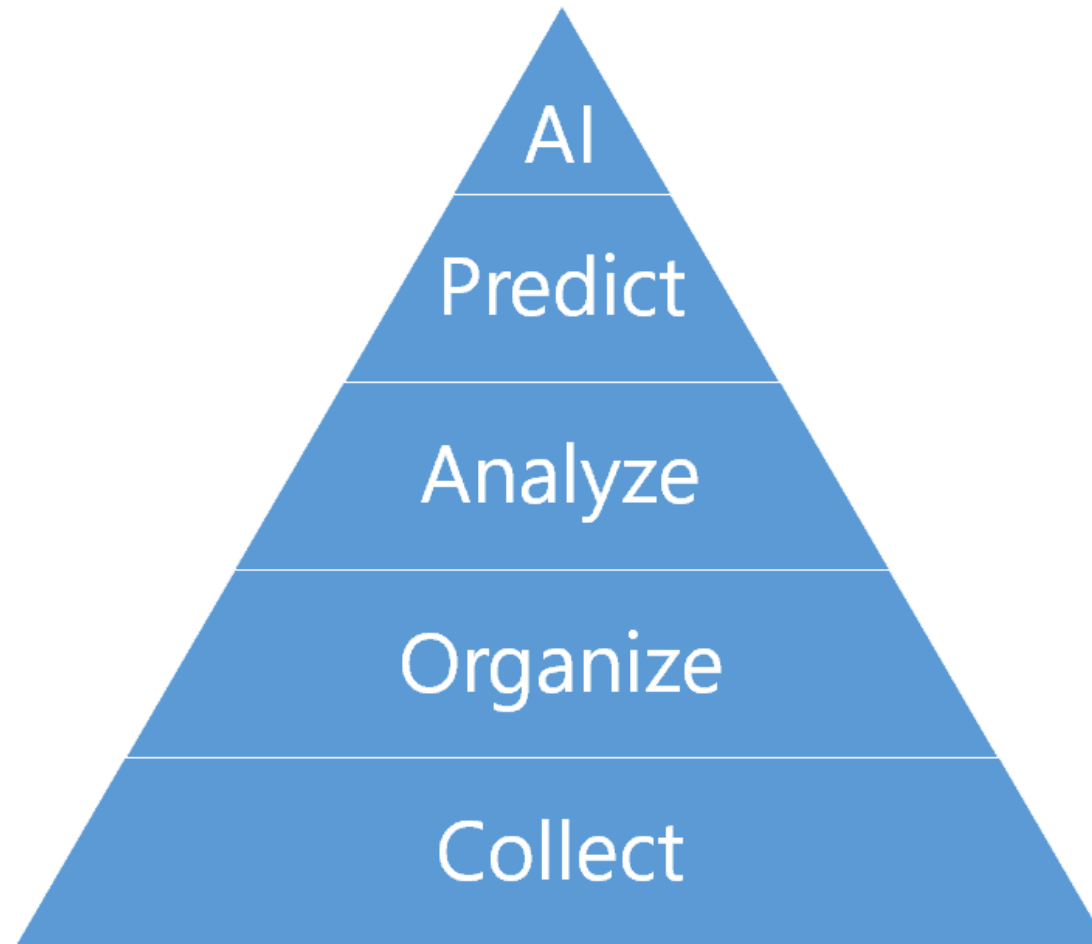
- **Instructor:** Prof. Gheith Abandah
- **Email:** abandah@ju.edu.jo
- **Office:** CPE 406
- **Home page:** <http://www.abandah.com/gheith>
- **Platform:** [MS Teams](#)
- **Office hours:** Sun Tue Thu 10:00–11:00
Mon 12:00–13:00
Wed 8:30–9:30

Professor Gheith Abandah

1. **Academic Career:** Full Professor of Computer Engineering at the University of Jordan.
2. **Education:** PhD and MSE from the University of Michigan; BSc from the University of Jordan.
3. **Leadership:** First President of Aqaba University of Technology and General Coordinator of the Erasmus+ DeCAIR project.
4. **Research & Publications:** 78 publications, 1400+ citations, h-index of 22, specializing in Computer Architecture, Arabic NLP, and machine learning.
5. **Industry Experience:** 15+ years in localization, military electronics, and product/project development, holding roles like VP Development and General Manager.
6. **IEEE Involvement:** Senior Member, co-founder and three-term chair of IEEE Jordan Section, leads IEEE Region 8 DEI Committee, Distinguished Visitor/IEEE Computer Society.
7. **Conference Leadership:** Established AEECT and JEEIT conferences, highlighting commitment to innovation and service.



Data Science Hierarchy of Needs



Data Science Hierarchy of Needs

THE DATA SCIENCE **HIERARCHY OF NEEDS**

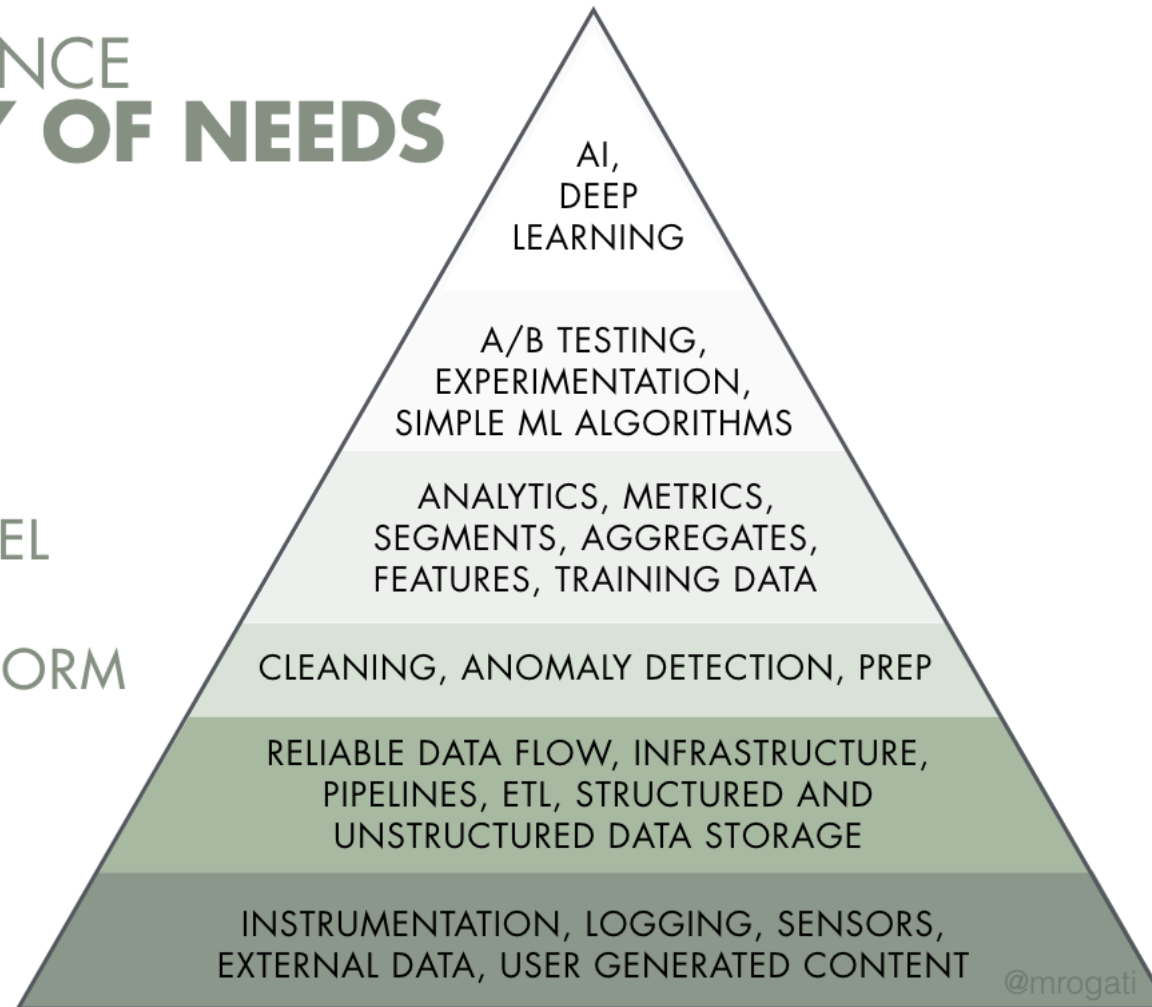
LEARN/OPTIMIZE

AGGREGATE/LABEL

EXPLORE/TRANSFORM

MOVE/STORE

COLLECT



What is Data Science?

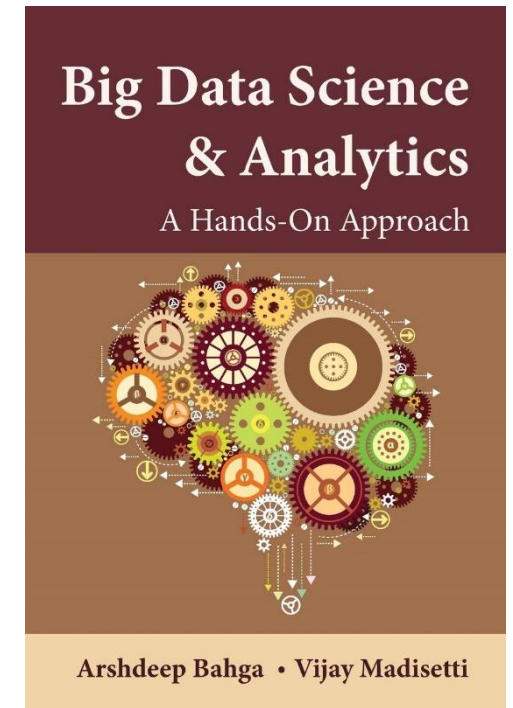
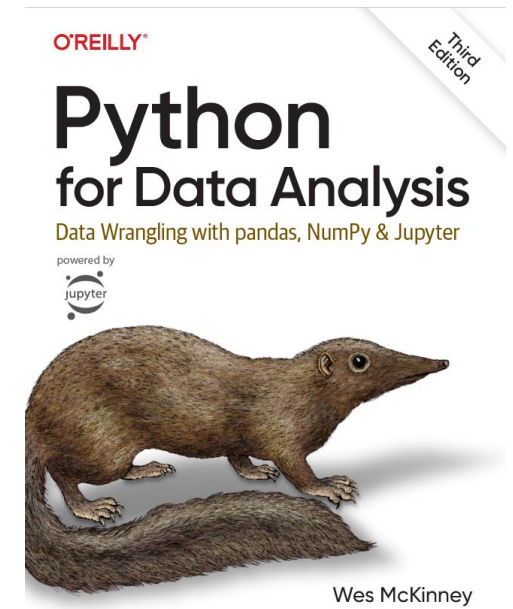
- YouTube Video from **Joma Tech**

What REALLY is Data Science? Told by a Data Scientist

<https://youtu.be/xC-c7E5PK0Y>

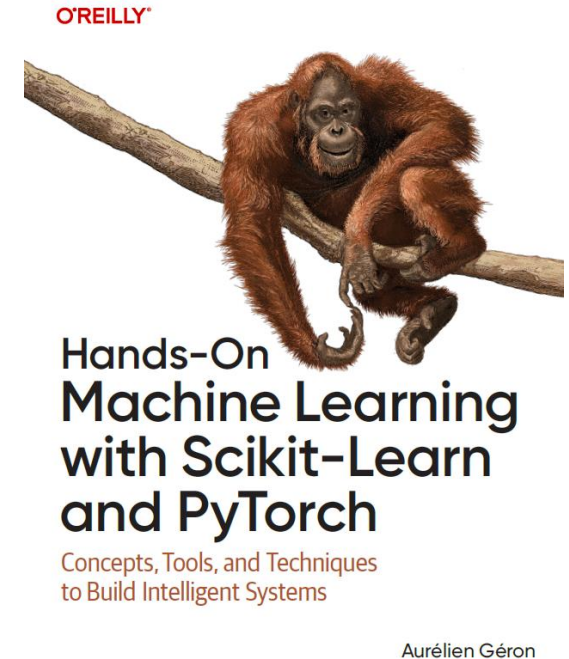
Textbooks

1. Wes McKinney, **Python for Data Analysis**: Data Wrangling with Pandas, NumPy, and Ipython, O'Reilly Media, 3rd Edition, 2022.
 2. Arshdeep Bahga and Vijay Madisetti, **Big Data Analytics**: A Hands-On Approach, 2019.
- Course slides at:
https://www.abandah.com/gheith/?page_id=3346



References

1. Aurélien Géron, **Hands-On Machine Learning** with Scikit-Learn and PyTorch: Concepts: Tools, and Techniques to Build Intelligent Systems, O'Reilly Media, 2025.
2. Jake VanderPlas, **A Whirlwind Tour of Python**, O'Reilly Media, 2016.
3. Joel Gurs, **Data Science from Scratch**, O'Reilly Media, 2015.



Course Objectives

- Introduce students to the practical techniques used in data analytics including loading, cleaning, preparation, wrangling, visualization, and analysis.
- Introduce students to the basic concepts and techniques in big data.

Course Outcomes

- Use Python and its specialized libraries to gain insight from data and solve problems.
- Know the main concepts and techniques used in handling big data and performing data analytics.

Course Outline

Week	Topic	Resources
1	Course Introduction	3
2+3	Pandas Data Structures, Essential Functionality & Descriptive Statistics	1
4+6	Data Loading, Storage and File Formats	1
6+7	Data Cleaning and Preparation	1
8	Data Wrangling: Join, Combine and Reshape	1
9+10	Plotting and Visualization with Matplotlib and Seaborn	1
11	Data Aggregation and Group Operations	1
12	Time Series	1
13	Introduction to Big Data	2
14	Big Data Architectures and Patterns	2
15	MapReduce Patterns	2

Policies

- Attendance is required
- Makeup exams need acceptable absence cause
- All submitted work must be yours
- Cheating will not be tolerated
- Join the [Microsoft Team](#)
- The use of any electronic or communication device is strictly prohibited during exams.
- Refer to the [relevant student bylaws](#).
- Check announcements on [Computer Engineering Dept](#) page.

Grading

Assessment tool	Mark	Topic(s)	Time
Quizzes	10%	Programming aspects	W2-W14
In-Class activities and participation	10%	Programming aspects	W2-W14
Midterm exam	30%	First 8 weeks	W8
Final exam	50%	All material	W16
Total	100%		

Important Dates

Date	Event
Mon 12/10/2026	First Lecture
Wed 4/11/2026	Quiz 1
Wed 2/12/2026	Midterm Exam
Wed 30/12/2026	Quiz 2
Wed 13/1/2027	Last Lecture
Wed 13/1/2027	Last Date to Withdraw
Sun 17/1 – Thu 28/1/2027	Final Exam Period

Questions

