

CMPS 460 – Machine Learning

Syllabus and Course Admin



Dr. Abdelkarim Erradi

Department of Computer Science & Engineering

Qatar University

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Outline

- Course introduction
- Grading
- Policies

About the Instructor

- **Dr. Abdelkarim Erradi**
 - **Office:** H07 - C309, College of Engineering
 - **Phone:** 4403 4254

Office hours:

- **Male - Monday 1:30pm to 2:30pm at H07-C309**
- **Female - Wednesday 12:15pm to 1:15pm at H07-A399**
- You can talk to me **after** class if you have quick issues/questions
- Best way to contact me is via **MS Teams chat**

Course Learning Outcomes

1. Understand the basic theoretical concepts and fundamental principles of machine learning
2. Compare and contrast various approaches to machine learning.
3. Gain **hands-on experience** with solving a real-world problem with appropriate machine learning techniques.
4. **Design, implement, and analyze** machine learning solutions

Prerequisites

- **Proficiency in Python.** All class assignments will be in Python. See that your level of knowledge is sufficient by going over the following tutorials
 - <https://docs.python.org/3/tutorial/>
 - <https://docs.scipy.org/doc/numpy/user/quickstart.html>
- **College Level Calculus, Linear Algebra.** You should be comfortable taking derivatives and understanding matrix/vector operations and notation
 - See <https://people.engr.tamu.edu/guni/csce689/files/linalg.pdf>
- **Basic Probability and Statistics.** You should be familiar with basics of probabilities, Gaussian distributions, mean, standard deviation, etc.
 - See <https://people.engr.tamu.edu/guni/csce689/files/prob.pdf>

Schedule

Topics	Weeks	Chapters
Introduction to Machine Learning	1	1
Working with Data	2	2, 3, 6, 7
Classification Models	2	18, 19, 20, 21
Regression Models	2	23, 24
Artificial Neural Networks	4	25, 26
Clustering	2	13, 14, 15
Project Presentations & Exams	2	

Your Grade is Based on

Assignments: 20% - 5 assignments

Quizzes: 15% - 4 take 3

(no makeup for missed quizzes)

Project & Presentation: 15%

Midterm Exam: 20% - Week 7 (Monday TBD)

Final Exam: 30%

Quizzes & Assignments

- **Quizzes:**
 - Short (~10 minutes) quizzes on BB
 - Quizzes will mostly include multiple-choice questions / short questions covering main concepts that were discussed in class
 - These quizzes will give you a good idea of your level of understanding
- **Assignments:**
 - You will implement common ML algorithms in Python
 - You will be graded separately on each algorithm

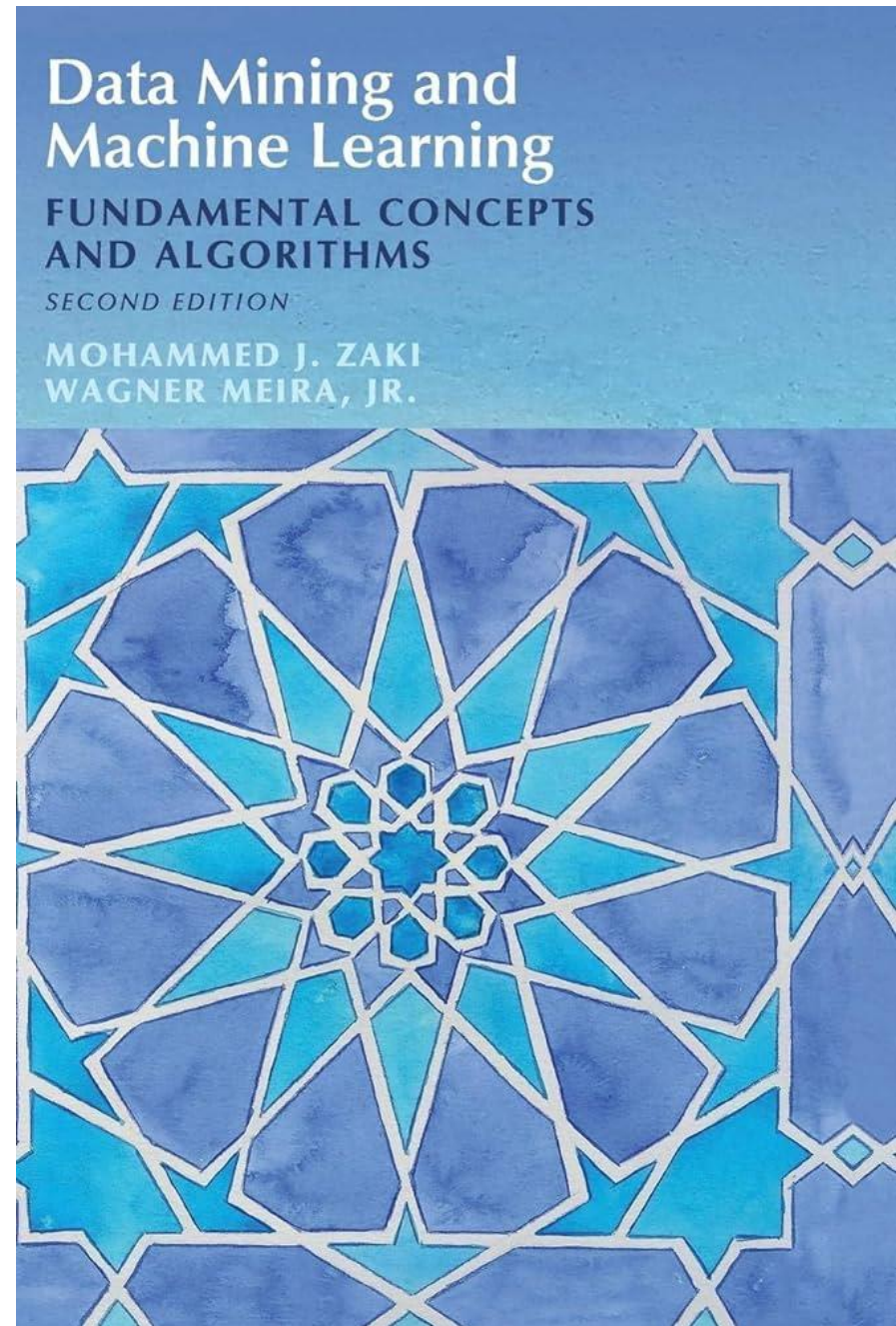
Exams and Project

- Exams assess understanding of concepts
- Project apply ML to real problem (you select the desired problem, design, implement, test and present).

Recommended Textbook

Mohammed J. Zaki, Wagner Meira, Jr., *Data Mining and Machine Learning: Fundamental Concepts and Algorithms*, 2nd Edition, Cambridge University Press, March 2020. ISBN: 978-1108473989. Available online [here](#)

**Plenty of online
resources will be
provided**



- Access the book
@
<https://learning.oreilly.com/library/view/hands-on-machine-learning/9781098125967/>
- Login using your
QU email and
password

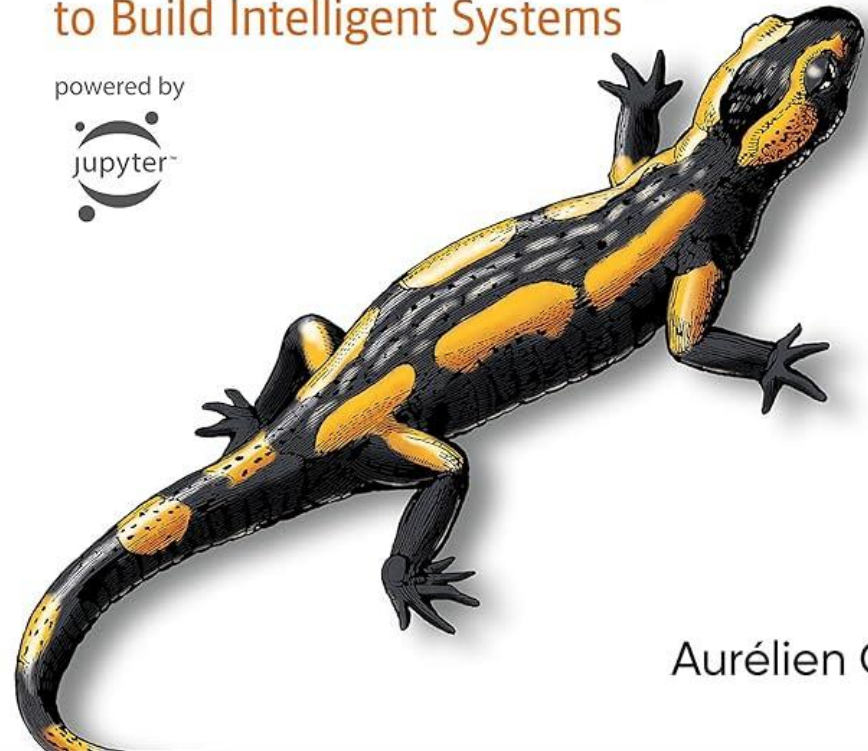
O'REILLY®

Third
Edition

Hands-On Machine Learning with Scikit-Learn, Keras & TensorFlow


Concepts, Tools, and Techniques
to Build Intelligent Systems

powered by



Aurélien Géron

How to succeed in this course....

- ❑ Do your weekly assigned readings
- ❑ **Read the slides before you come to the class**
- ❑ **Exercise a lot – study as many examples as possible**
 -  – Understand and enhance the examples I provide as well as the ones in the textbook and the ones in the provided resources
- ❑ **Attend and participate in class**
 - ❑ Many of the exam questions are from the class explanation
- ❑ Do all the assignments and project yourself. Actively contribute to your project.
- ❑ Seek help when needed and ask questions (and do it EARLY): During Lectures & Come to office hours



We learn swimming by swimming and we learn
ML by practicing it!

If you cannot implement it, then you simply
do not understand it

Software we will use

- VS Code
- Jupyter Notebook
- GitHub Desktop
- Anaconda
- Other tools will be communicated to you as we go



**GitHub will be used to deliver Slides,
Examples, Assignments, and Project**

<https://github.com/cmeps460s24/cmeps460-content>

Check it regularly!

Communication

- Post your technical questions to <https://github.com/cmpps460s24/cmpps460-content>

Do NOT send me by email

- To contact me do not send emails but use **Microsoft Teams** chat
- For **guidance** on technical issues come to office hours NOT by email

Important Notes

- **Attendance...** QU attendance policies will be enforced
 - Do not miss classes/labs
- **Start your assignments and project early!!!**
- This is a senior-level course and students are expected to learn independently as much as needed in order to complete the course requirements
 - Do not expect me to find/fix your code bugs
 - Do not expect me to find and fix your technical issues
 - => I can only give you high level suggestions and guidance

No 'Free Riding' allowed

- 'free riders' (who do not contribute much) => not acceptable and not fair for hardworking students
 - You must actively contribute to your project and do your ultimate best to deliver the best possible results
 - Otherwise you will be asked to do the project alone
 - **Report free-riders early**



Plagiarism / Cheating

- “Getting an unfair academic advantage”
 - Using other people's work as your own
 - Not doing your assignments yourself
- All the code you submit must be your own
 - Only exception: Code I have provided or explicitly authorized
 - **NO** code you have found on the web. **NO** sharing with others.
- **Do your homework and project yourself**
 - Do NOT copy from each other or from the Internet - **I will know it!**
 - You can be picked-up randomly to explain your implementation
 - Cheating will be treated very seriously
- Penalties START with a zero on the assignment, failing the course! and other disciplinary actions as per QU policy

To do before next class

- Install the required software: VS Code & GitHub desktop (see announcement on Teams)
- Decide your team members and enter them in the spreadsheet on Teams
- Create your GitHub account (firstname-quUsername)
- Prepare any questions you might have



I wish you a fruitful and enjoyable journey!