ensia The National School of Artificial Intelligence
المدرسة الوطنية العليا للذكاء الاصطناعي

Data Structure and Algorithms 2

Course Organisation

Dr. Fouzia ANGUEL

2nd year / S3

September 2024 – January 2025

Course Instructors

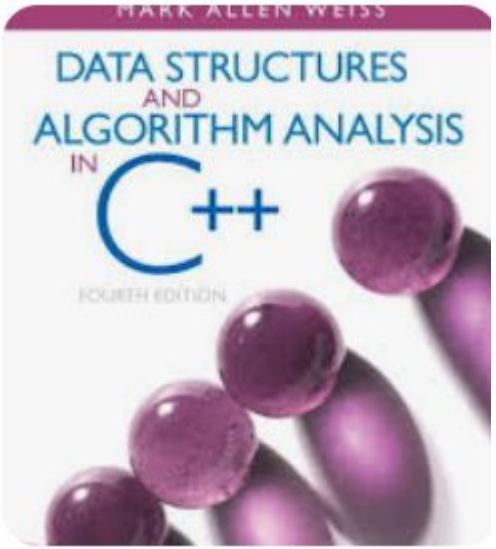
Lectures 1h30/**Week**	**Dr. ANGUEL Fouzia**	**Section 1 & 2**
Tutorials 1h30/Week	Dr. ANGUEL Fouzia	G2-G9
	Dr. DEGHBOUCH Hichem	G1-G5-G11
	Dr. LOUNIS Ouarda	G6-G10-G12
	Dr.CHERIET Abdelhakim	G3-G4-G7-G8
Labs 1h30/Week	Dr. IBLAIDEN Farah	G2-G3-G4-G5- G6-G8-G10-G11
	Dr.CHERIET Abdelhakim	G1-G7-G9-G12
Office Hours	Dr. ANGUEL Fouzia	**Monday** 13:30-15:00 **Thursday** 13:30-15:00

Course Objectives

- Demonstrate an understanding of some important advanced algorithms and data structures.
- Analyze a given problem and identify the computing requirements appropriate for its solution.
- Apply appropriate algorithmic design paradigms and data structures for solving a given problem.
- Reason about the correctness and performance of the resulting algorithms.
- Analyze the time complexity of algorithms using Big O, Big Ω, and Big Θ notations.
- Understand how different data structures affect the performance of algorithms.

Textbook

Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, 4th edition, Pearson, 2014



Prerequisites : Algorithms & C++ programming, Object Oriented Programming ,Fondamental mathematics

Assessment and Grading

Final Examination January 2025	50 %	
Course Work 50 %	Midterm Examination	20 %
	2 Homework Assignments	10%
	2 in class Quizzes	15%
	Attendance Labs & tutorials	5%

Course Schedule (14 weeks)

Week	Chapters	
1	1 Programming: A General Overview	25/09/2024
2,3	2. Algorithm Analysis	
4,5	3. Lists, Stacks, and Queues	
6	4. Trees	
	Quiz #1	/11/2024
7	4. Trees	
	Midterm Exam	
8,9	5. Hashing	
10,11	6. Priority Queues (Heaps)	
	Quiz #2	/12/2024
12,13	7. Sorting	
14	8. Graphs	
	Final Exam	/01/2025

Other References

- D. S. Malik, Data Structures Using C++, 2nd Edition,Course Technology - Cengage Learning, 2010.
- John Carey, Shreyans Doshi, & Payas Rajan, C++ Data Structures and Algorithm Design Principles: Leverage the power of modern C++ to build robust and scalable applications, Packt Publishing, 2019.
- Sartaj Sahni; Data Structures, Algorithms, and Applications in C++; Silicon Press; 2004.
- Adam Drozdek, Data Structures and Algorithms in C++, 4th Edition, Cengage Learning / Course Technology, 2012.
- Michael T. Goodrich, Data Structures and Algorithms in C++, 2nd Edition, Wiley, 2011.