PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

HARMONIZATION MASTER'S TRAINING OFFER

ACADEMIC/PROFESSIONALIZING

Establishment	Faculty / Institute	Department
University of Khemis	Matter and Computer	Mathematics and
Miliana	Science	Computer Science

Field: Mathematics and Computer Science

Major: Computer science

Specialty: Artificial Intelligence and Big Data

Academic year: 2023/2024

I - Identity card of the Master

1 - Localization of the training offer:

Faculty (or Institute): Matter and Computer Science Department: Artificial Intelligence

2 – Background and objectives of the training

A - Conditions of access

Students who have completed a **Bachelor's degree** in the field of **Mathematics and Computer Science**, specializing in **Computer Science**, or an equivalent qualification, are eligible to apply for this Master's program.

Admission is based on an application review and is subject to the availability of seats. The number of available seats is determined by two main factors: the **available supervisory resources** and the **academic performance achieved during the Bachelor's degree in Computer Science**.

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B - Objectives of The Training

The objective of the **Master's program in Artificial Intelligence and Big Data** is to provide students with **high-level education**, enabling them to integrate seamlessly into the socioeconomic sector, join public or private research institutions, and pursue careers in either theoretical or applied research of the highest quality.

The IABD Master's program offers a comprehensive theoretical and practical curriculum covering the core areas of Artificial Intelligence, Data Science, Machine Learning and Deep Learning, Databases, Big Data and Cloud Computing, Optimization, as well as Image and Natural Language Processing. The program aims to train data science and big data specialists with a strong grasp of the concepts, models, and tools of artificial intelligence.

This Master's program provides **in-depth training** in **Big Data and Data Science** and their applications. Graduates can take on **various computer engineering roles**, particularly as **Data Analysts, Data Scientists, Analytics Consultants, and Data Engineers** in both public and private sectors. Additionally, they may pursue a **Ph.D. in Computer Science**, with a focus on **Artificial Intelligence, Data Science, or Natural Language Processing**.

C - Targeted job profiles and skills

The impact of the field of **Artificial Intelligence** is highly significant due to its **key role** in technological applications that have become essential in the real world. These include **data mining in e-commerce, social network analysis, automated trading in real markets, sensor networks, and many others**.

A graduate of the **Master's in Artificial Intelligence and Big Data (IABD)** program is expected to:

✓ Acquire in-depth and solid knowledge in Computer Science, particularly in Artificial Intelligence, Large-Scale Data Processing and Analysis, Knowledge Extraction from Complex Data, Information Representation and Visualization, among others.

✓ Design and develop intelligent systems for managing large-scale, heterogeneous, or linked data on the web.

✓ Master the **design and implementation of learning systems**, from **raw data processing to performance evaluation**.

✓ Be introduced to scientific research, including academic writing, presentation techniques, and the use of advanced computational tools, while adopting a scientific approach.

D - Regional and national potential for the employability of graduates

Upon completing the program, graduates can either **enter the workforce** as holders of a **Master's degree in Artificial Intelligence and Big Data** or **pursue a Ph.D. in Computer Science**. Whether at the **local, regional, national, or international level**, IABD graduates will possess the necessary **skills and expertise** to work in various **public and private sectors**.

Career opportunities after completing the Master's program include:

- Artificial Intelligence Engineer
- Data Scientist, Data Engineer, or Data Analyst
- Data Warehouse and Database Administrator
- Cloud Architecture Expert
- Big Data Application Designer/Developer
- Research and Development Engineer

E – Monitoring indicators of the training

A transfer is permitted **to and from** other specializations deemed **closely related**. However, the transfer can only be granted **after a thorough review of the candidate's application** by the academic committee.

F – Supervision capacity: 20 students.

II – Semester organization card for teaching

1- Semester 1 :

Teaching Unit	Semi- Annual Hourly Volume	We	eekly Ho	urly Volu	me	Coeff	Credits	Evaluation method	
	14-16 Weeks	С	TD	TP	other			Continuous	Exam
Fundamental T Unit									
F.T.U 11	112h30					11	20		
Advanced Algorithms and Complexity	67h30	1h30	1h30	1h30	3h	3	5	40%	60%
Combinatorial Optimization	45h		1h30	1h30	1h30	2	4	40%	60%
F.T.U 12	112h30								
Machine Learning	67h30	1h30	1H30	1h30	1h30	3	6	40%	60%
Artificial Intelligence: Principles and Applications	45h		1h30	1h30	3h	3	5	40%	60%
Methodological T Unit									
M.T.U 1	90h00					4	7		
Data Analysis	45h		1h30	1h30	1h30	2	3	40%	60%
Introduction to Data	45h	1h30		1h30	1h30	2	4	40%	60%
Discovery T Unit									
D.T.U 1	22h30					1	1		
Cybersecurity	22h30			1h30	1h30	1	1		100%
Transversals T Unit									
T.T.U 1	22h30					1	1		
General English	22h30		1h30		1h30	1	1	40%	60%
Total Semester 1	360H	4H30	9H	10h30		17	30		

Semester 2:

Teaching Unit	Semi- Annual Hourly Volume	Wee	ekly Hou	rly Volui	me	Coeff (Credits	Evaluation method	
	14-16 Weeks	С	TD	TP	other			Continuous	Exam
Fundamental T Unit									
F.T.U 21	112h30					11	20		
Deep Learning	67h30	1h30	1h30	1h30	3h	3	6	40%	60%
Metaheuristics and Evolutionary Algorithms	45h	1h30	1h30		1h30	3	5	40%	60%
F.T.U 22	112h30								
Advanced Databases	67h30	1h30	1H30	1h30	1h30	3	5	40%	60%
Data Mining	45h	1h30	1h30		1h30	2	4	40%	60%
Methodological T Unit									
M.T.U 21	90h00					4	7		
Software Engineering	45h	1h30	1h30		1h30	2	4	40%	60%
Business Intelligence and Data Visualization	45h	1h30		1h30	1h30	2	3	40%	60%
Discovery T Unit									
D.T.U 21	22h30					1	2		
Internet of Things	22h30	1h30			1h30	1	2		100%
Transversals T Unit									
T.T.U 21	22h30					1	1		
Scientific Research Methodology	22h30		1h30		1h30	1	1	40%	60%
Total Semester 2	360H	10H30	9H00	4h30		17	30		

Semester 3:

Teaching Unit	Semi- Annual Hourly Volume	Wee	ekly Hou	rly Volu	me	Coeff	Coeff Credits	Evaluation method	
	14-16 Weeks	С	TD	TP	other			Continuous	Exam
Fundamental T Unit									
F.T.U 21	180h00					9	18		
Deep Learning	67h30	1h30	1h30	1h30	3h	3	6	40%	60%
Metaheuristics and Evolutionary Algorithms	45h	1h30	1h30	1h30	1h30	3	6	40%	60%
Data Mining	67h30	1h30		1h30	1h30	3	6	40%	60%
Methodological T Unit									
M.T.U 21	135h00					6	9		
Software Engineering	45h	1h30		1h30	1h30	2	3	40%	60%
Advanced Databases	45h	1h30		1h30	1h30	2	3	40%	60%
Business Intelligence and Data Visualization	45h	1h30	1h30		1h30	2	3	40%	60%
Discovery T Unit									
D.T.U 21	22h30					1	2		
Internet of Things	22h30	1h30			1h30	1	2		100%
Transversals T Unit									
T.T.U 21	22h30					1	1		
Scientific Research Methodology	22h30	1h30			1h30	1	1	40%	60%
Total Semester 2	360h00	12h00	7h30	6h		17	30		

Semestre 4 Field: Mathematics and Computer Science

Major: Computer science

Specialty: Artificial Intelligence and Big Data

Stage in a company sanctioned by a memory and a defense.

Credit	Coeff	Total Hours (T.H.)	
			Personal Work
			Internship in a Company
			Seminars
			Other (Specify)
30	17	360h00	Total for Semester 4