HELLENIC OPEN UNIVERSITY

"Data Science and Machine Learning"
DAMA Postgraduate Program

School of Science & Technology

Dimitris Kalles
Professor, DAMA Director

DAMA aims at …

- Delivering knowledge and developing skills on state-of-the-art methods and computing tools in Data Science and Machine Learning
  - in an accessible manner and by promoting active learning
- Combining knowledge of fundamental concepts and techniques with specific applications
  - so that its graduates will be aptly skilled in today's and tomorrow's labor market

HELLENIC OPEN UNIVERSITY

HOU in numbers

4 Schools

77 Study Programs

57 # Faculty

~2200 # Adjunct Faculty

~25000 Students (active)

~95000 Graduates

https://www.youtube.com/watch?v=1NpjflviFo8

https://numbers.eap.gr/

HELLENIC OPEN UNIVERSITY

HELLENIC OPEN UNIVERSITY

Open Universities & Distance Education

A Different Way to Learn

Distance Education

- Education without the classroom
- The students are free from the constraints of the time and the pace of study
- Independent and autonomous education:
  - Tutors will be accessible and supportive but they will give as much assistance as needed so that students can progress on their own

HELLENIC OPEN UNIVERSITY

What is really important in Distance Education?

- The "**Communication**" with the Educational Material

- The **Communication** with the Tutor and the Fellow-Students
  - ✓Tutorial Meetings (a Tutor meets 10-25 Students, for 4 hours, 5 times/year)
  - ✓Forum (mostly between a Tutor and Students)
  - ✓E-mails (mostly, 1-1)
  - ✓Phone (mostly, 1-1)

What is the Role of the Tutor in DE?

The Tutor in DE:

- Is **accessible**, **supportive** but he/she gives as much assistance as needed so that students can progress **on their own**
- Monitors the students' progress in doing their individual tasks
- **Encourages autonomous** learning
- Offers to students **immediate, effective and personalized** guidance

HELLENIC OPEN UNIVERSITY

Why are the Tutorial Meetings very Important to attend?

The Tutorial meetings help you to:

- Solve problems in a team
- Feel part of a team with the same concerns and goals
- Develop your group skills
- Get to know your peers better
- Be prepared for your tasks and your final exam
- Clarify any concepts that you might not understand
- Practice presentations (public speaking)
- Continue your studies by giving you motivations

Key aspects of HOU Educational Methodology

- Up-front, timely provision of all material, study schedule and activities calendar
- Small student groups (20-25 students)
- Flexible, multi-faceted communication (group/personalized, synchronous/asynchronous, etc.)
- Evaluation and feedback

HELLENIC OPEN UNIVERSITY

DAMA Modules (core, as of 2026-27)

DAMA501	**Linear Algebra and Calculus**	**(C, 15 ECTS)**
DAMA503	**Programming, Databases and Algorithms**	**(C, 15 ECTS)**
DAMA502	**Statistics and Optimization**	**(C, 15 ECTS)**
DAMA510	**Machine Learning**	**(C, 15 ECTS)**
DAMA600	**Mining of Massive Datasets**	**(C, 15 ECTS)**
DAMA610	**Deep Learning**	**(C, 15 ECTS)**

For the acquisition of the Master's Degree the successful attendance of the four compulsory course modules is required, for a total of 90 ECTS (1 ECTS = 25-30 hours).

After completing 90 ECTS, the student might also opt to attend:

DAMA700	**Applied Research and Development: Systems Practicum**	**(E, 15 ECTS)**

HELLENIC OPEN UNIVERSITY

DAMA Modules (flexible, as of 2026-27)

DAMA501	Linear Algebra and Calculus	(E, 15 ECTS)
DAMA503	**Programming, Databases and Algorithms**	**(C, 15 ECTS)**
DAMA502	Statistics and Optimization	(E, 15 ECTS)
DAMA510	**Machine Learning**	**(C, 15 ECTS)**
DAMA600	**Mining of Massive Datasets**	**(C, 15 ECTS)**
DAMA610	**Deep Learning**	**(C, 15 ECTS)**
DAMA700	Applied Research and Development: Systems Practicum	(E, 15 ECTS)

For the acquisition of the Master's Degree the successful attendance of the four compulsory course modules is required, for a total of 90 ECTS (1 ECTS = 25-30 hours).

HELLENIC OPEN UNIVERSITY

DAMA Modules (all compulsory, up to 2025-26)

First Year →	DAMA50 Mathematics for Machine Learning
First Year →	DAMA51 Foundations in Computer Science
Second Year →	DAMA60 Algorithmic Techniques and Systems for Data Science and Machine Learning
Second Year →	DAMA61 Numerical and Computational Techniques for Data Science and Machine Learning

For the acquisition of the Master's Degree the successful attendance of the four compulsory course modules is required, for a total of 120 ECTS (1 ECTS = 25-30 hours).

HELLENIC OPEN UNIVERSITY

Study Schedule (DAMA51 snapshot)

STUDY SCHEDULE DAMA 51 2024-25						
Study Weeks	Study Dates (From)	Study Dates (To)	Chapters from Book 1 [GtIDA]	Chapters from Book 2 [DSBDA] (or Book 3 [ItR]	Written Assign.	Tutorial Meetings
1	01/10/2024	06/10/2024	Chapter 1 - Introduction Chapter 2 - Practical Data Analysis: An Example Chapter 3 - Project Understanding			
2	07/10/2024	13/10/2024	Appendix A - Statistics, A1, A2	Chapter 1 - Introduction to Big Data Analytics		
3	14/10/2024	20/10/2024	Appendix A - Statistcs, A3	Chapter 2 - Data Analytics Lifecycle		Tutorial 1
4	21/10/2024	27/10/2024	Appendix A - Statistics, A4			
5	28/10/2024	03/11/2024	Appendix B - The R Project	Book 3 [ItR]		
6	04/11/2024	10/11/2024		Chapter 3 - Introduction to R		
7	11/11/2024	17/11/2024	*Appendix C - KNIME*	Chapter 3 - Exploratory Data Analysis		
8	18/11/2024	24/11/2024	Chapter 4 - Data Understanding I, 4.1, 4.2, 4.3, 4.3.1, 4.4, 4.5, 4.6, 4.7	Chapter 3 - Statistical Methods for Evaluation	HW1	
9	25/11/2024	01/12/2024	Chapter 4 - Data Understanding II, 4.3.2	*Chapter 11 - In-Database Analytics*		Tutorial 2
10	02/12/2024	08/12/2024	Chapter 4 - Data Understanding III 4.8			
11	09/12/2024	15/12/2024	Chapter 5 - Principles of Modeling I, 5.1, 5.2, 5.3			
12	16/12/2024	22/12/2024	Chapter 5 - Principles of Modeling II, 5.4, 5.5, 5.6			
13	23/12/2024	29/12/2024	CHRISTMAS HOLIDAYS			
14	30/12/2024	05/01/2025	Chapter 6 - Data Preparation			
15	06/01/2025	12/01/2025	Chapter 7 - Finding Patterns, 7.1 Hierarchical Clustering		HW2	
16	13/01/2025	19/01/2025	Chapter 7 - Finding Patterns, 7.2 Notion of (Dis-)Similarity			Tutorial 3
17	20/01/2025	26/01/2025	Chapter 7 - Finding Patterns, 7.3 Prototype-Based Clustering	Chapter 4 - Clustering		

Tutorial Meetings: Do not miss them!

DAMA51-HΛE41

Sun, 20 Oct 2024, 4:00 PM

Group event

ΟΣΣ1 DAMA51-HΛE41

ΑΙΘΟΥΣΑ

https://hou.webex.com/meet/kalles

DAMA51 - FOUNDATIONS IN COMPUTER SCIENCE

DAMA51-HΛE41

AMA 51 2024-25

Study Weeks	Stud (F		Chapters from Book 2 [DSBDA] (or Book 3 [ItR]	Written Assign.	Tutorial Meetings
1	01/1				
2	07/1		Chapter 1 - Introduction to [illegible]		
3	14/1		Chapter 2 - Data Analytics Lifecycle		Tutorial 1
4	21/1				
5	28/1		Book 3 [ItR]		
6	04/1		Chapter 3 - Introduction to R		
7	11/1		Chapter 3 - Exploratory Data Analysis		
8	18/1	4.5, 4.6, 4.7	Chapter 3 - Statistical Methods for Evaluation	HW1	
9	25/1		*Chapter 11 - In-Database Analytics*		Tutorial 2
10	02/1				
11	09/1				
12	16/1				
13	23/1	CHRISTMAS HOLIDAYS			
14	30/1				
15	06/0			HW2	
16	13/0	y			Tutorial 3
17	20/0	ring	Chapter 4 - Clustering		

HELLENIC OPEN UNIVERSITY

2 or 3 Written Assignments (plus quizzes/activities)

Please pay attention:

- Do not leave the submission of your assignments to the last days or hours
- If the system crashes, you are part of the problem
- The confusion and stress is what you give to yourselves by submitting as late as you can
- The deadlines cannot be extended

How to calculate the total grade

The average of the written assignments	→	30% (or 40%) of the total grade
Final exam	→	70% (or 60%) of the total grade

Pay Attention

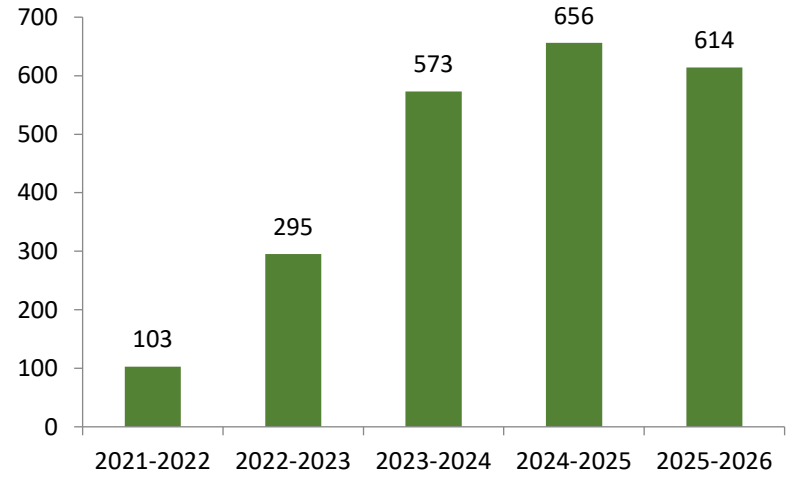
You cannot take the final exam if the average of the written assignments is lower than 5

HELLENIC OPEN UNIVERSITY

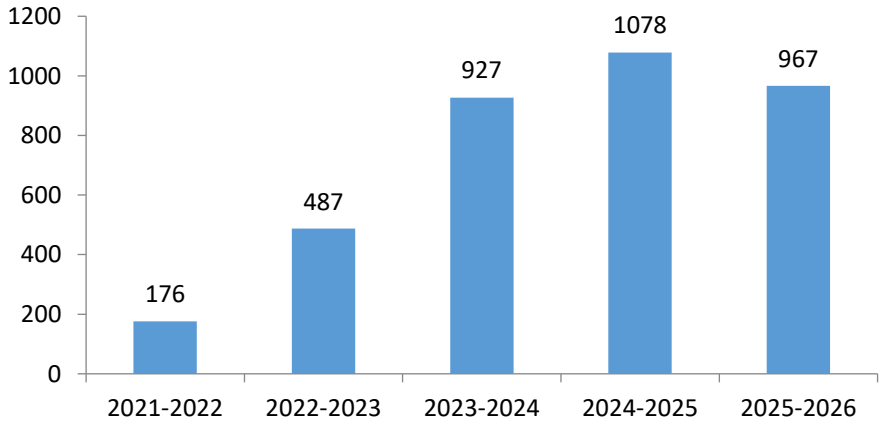
ΕΛΛΗΝΙΚΟ ΑΝΟΙΚΤΟ ΠΑΝΕΠΙΣΤΗΜΙΟ

Interesting statistics (DAMA)

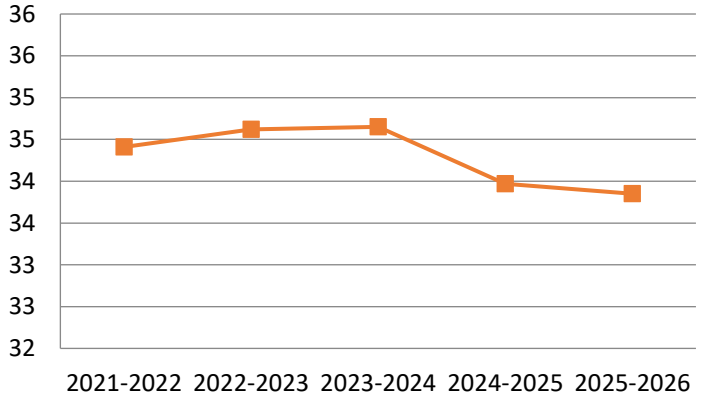
Active students per academic year



Number of Module enrollements per academic year



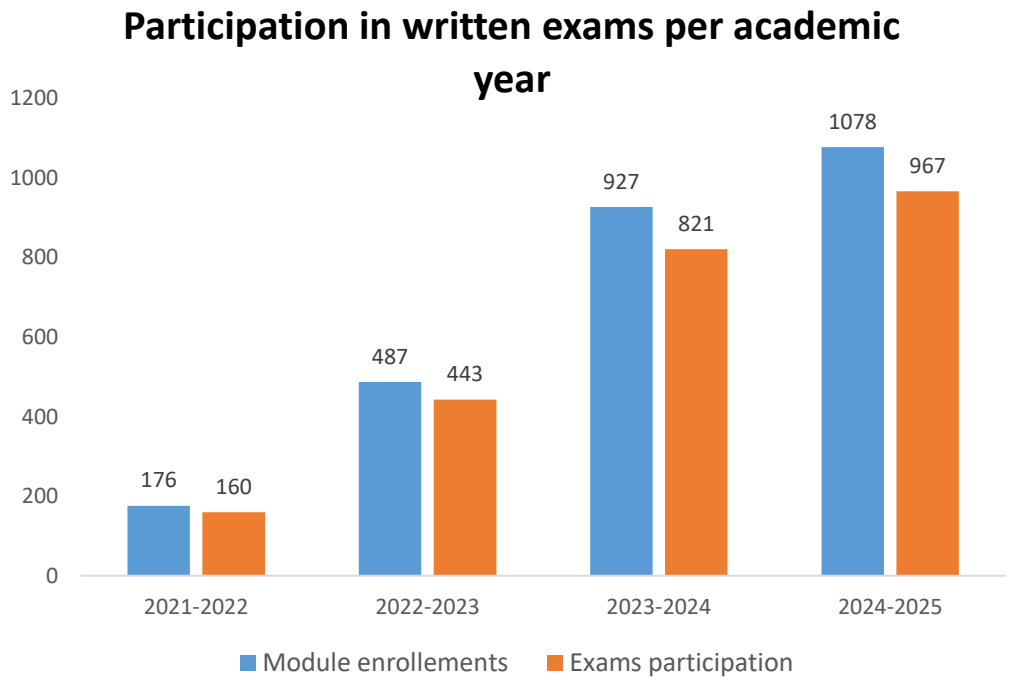
Average newcomers age per enrollement year

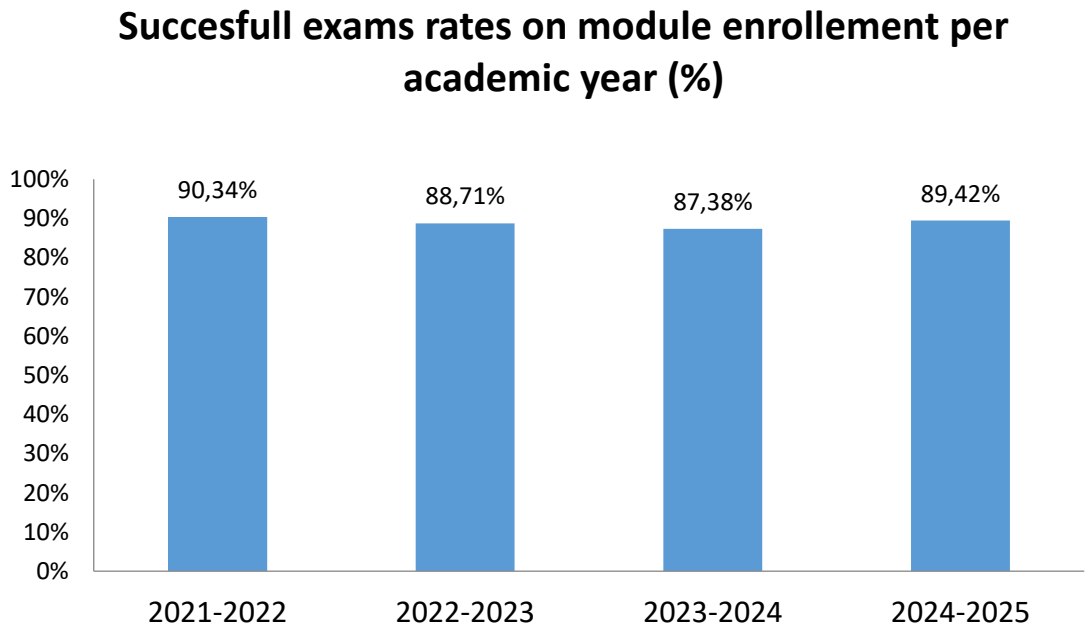


HELLENIC OPEN UNIVERSITY

ΕΛΛΗΝΙΚΟ ΑΝΟΙΚΤΟ ΠΑΝΕΠΙΣΤΗΜΙΟ

Participation in written exams (DAMA)



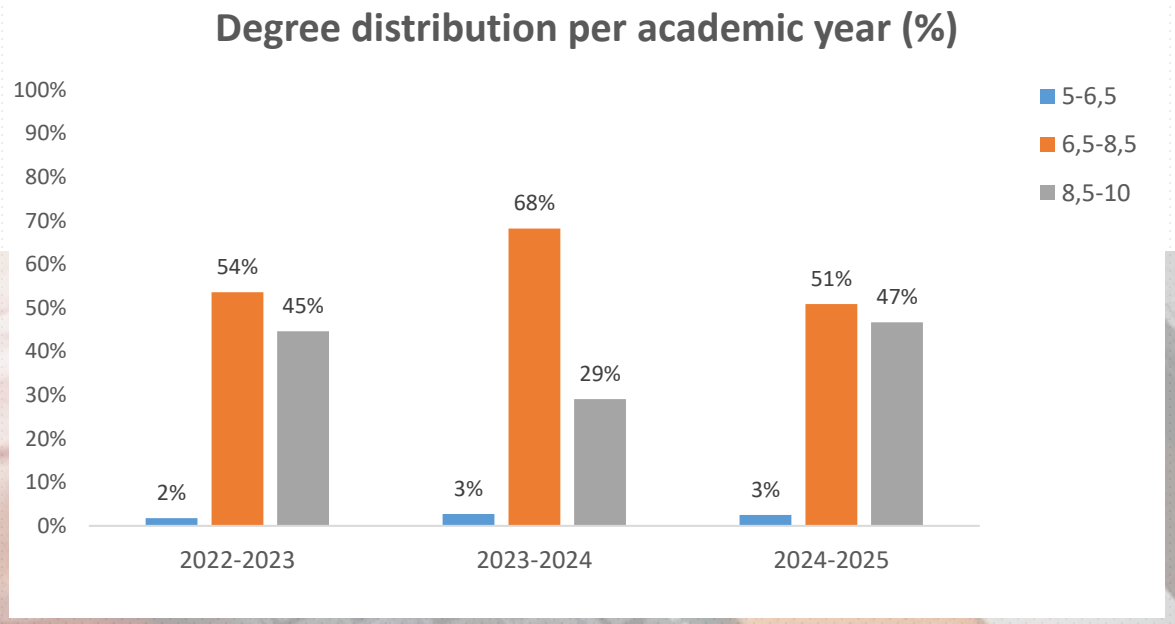


HELLENIC OPEN UNIVERSITY

ΕΛΛΗΝΙΚΟ ΑΝΟΙΚΤΟ ΠΑΝΕΠΙΣΤΗΜΙΟ

Graduates (DAMA)

Average time to complete studies: 2,21 years
Up to now: 404 graduates
Average graduates' age: 36 years

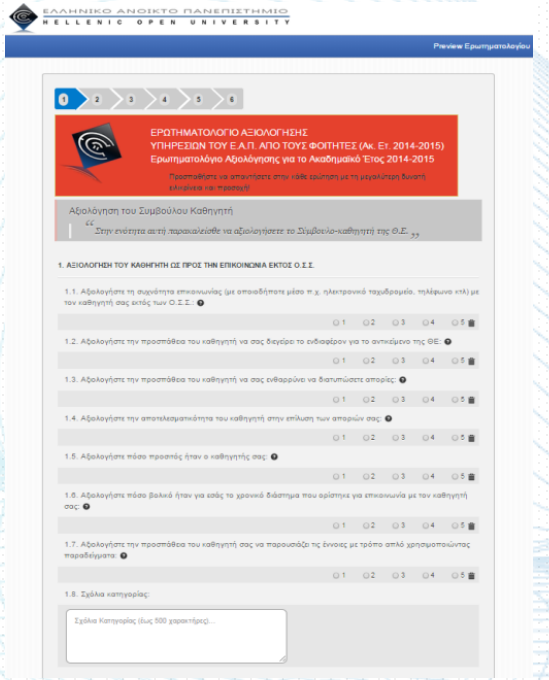


HELLENIC OPEN UNIVERSITY

ΕΛΛΗΝΙΚΟ ΑΝΟΙΚΤΟ ΠΑΝΕΠΙΣΤΗΜΙΟ

Evaluation of DAMA

DAMA participates in external evaluations / certifications as defined from Hellenic Authority for Higher Education (HAHE)



- ✓ The programme is evaluated internally, annually, from students (participation over 50%) regarding:
  - Tutors
  - Educational material
  - Module Organization
  - Administrative services
  - Infrastructures
- ✓ The evaluation is anonymous and voluntary and is performed through the completion of an electronic questionnaire.

Μονάδα Εσωτερικής Αξιολόγησης
ΕΛΛΗΝΙΚΟ ΑΝΟΙΚΤΟ ΠΑΝΕΠΙΣΤΗΜΙΟ

HELLENIC OPEN UNIVERSITY

When do we reach the module Coordinator and the Director of the program?

Tutor → **Module Coordinator** → **Program Director**

- Prior to the contact with the Module Coordinator, **extensive communication** has to be taken place with your Tutor on the matter.
- The Module Coordinator **is only to be reached** in case there was no satisfactory outcome.
- The Program Director should be contacted only if communication between you and the Module Coordinator, was not also fruitful.

HELLENIC OPEN UNIVERSITY

We can promise that we will provide a supportive instruction to all of you.

However, our dedication is expected to be matched by your willingness to put forth your best effort.

HELLENIC OPEN UNIVERSITY

Have a new academic year full of creativity!

HELLENIC OPEN UNIVERSITY