

PNRR Achieve-It project funded by Italian Ministry of
University and Research (MUR)

ACHIEVE-IT

Academic Collaboration through Higher International
Education for a Viable and Equitable Africa with Italy CUP:
D91I23001030006

Winter School

LOGIC AND MACHINE LEARNING

CALL FOR APPLICATION

GENERAL INFORMATION

The University of Ferrara, within the framework of the PNRR Achieve-It project “Academic Collaboration through Higher International Education for a Viable and Equitable Africa with Italy (ACHIEVE-IT)” - CUP: D91I23001030006 -, announces a call for applications for the selection of **9 researchers and university lecturers** to participate in the advanced training course titled “**LOGIC AND MACHINE LEARNING**”.

Description of course content

This advanced course is designed to focus on the intersection between formal logic and machine learning, from both a theoretical and practical point of view. Our objective is to explore basic and advanced concepts in formal logic intended as tools to express machine learning concepts.

In the first part, we shall start with introductory material in logic ‘as a tool’, from propositional to first-order logic, concepts such as satisfiability, validity, entailment and minimization of formulas. Then we shall move to non-classical logic, and, in particular, to modal, temporal and spatial logics, extending the previous ideas to





this more general context. Then, we shall introduce the concept of many-valued, classical and non-classical logic, as a further extension and generalization.

In the second part of the course, we shall move to symbolic machine learning models, and we shall focus on two key aspects: how these models can be used to learn from both tabular and non-tabular data, and how they can be seen as logical tools. Then, we shall move to the idea of logical explanations of machine learning models, with standard and advanced techniques.

The course will be organized into five classes of three hours each. Each class will be then paired with a practice, hands-on lecture, of one hour, for a total of 4 hours per day, 5 days (Monday to Friday). All practice will be guided and will be focused on solving practical problems.

Ideally, by the end of the course, the attendees will be able to design, solve, and explain an advanced machine learning problem using logical tools. Examples will include modern published results.

The school is organized with the help of the [ACLAI-Lab](#), at the University of Ferrara.

Planned activities:

The course will include theory and practice sessions (3+1 hours) per day. Participation in the course includes **5 days of in-person attendance** at the **University of Witwatersrand** (Johannesburg). The course will take place from **January 12 to January 16, 2026**.

Benefits of the Mobility Grant

Selected participants will benefit from:

- A fully funded training period.
- Opportunities for academic exchanges and collaboration.
- Exposure to innovative methodologies.
- Potential to establish long-term research and teaching collaborations.

Target Audience

This call is specifically addressed to researchers and lecturers in the fields of computer science, mathematics, logics, data science, statistics, and affine fields from the following universities:

South Africa:

- South Africa-**University of the Witwatersrand**, Johannesburg
- South Africa- **University of Johannesburg**, Johannesburg
- South Africa-**University of Pretoria**, Pretoria
- South Africa-**Stellenbosch University**, Stellenbosch

Non-South Africa:



-
- Cabo Verde- **Universidade Lusofona**, Mindelo
- Ethiopia- **Hawassa University**, Hawassa
- Kenya- **Kenyatta University**, Nairobi
- Rwanda- **Catholic University of Rwanda**, Butare
- Rwanda -**University of Rwanda**, Kigali
- Sénégal- **UCAD Université Cheikh Anta Diop**, Dakar

FINANCIAL SUPPORT

The financial support must be considered to cover the expenses related to travel and the stay abroad. The amount is related to the days of actual stay in the host institution. In particular, the funding is as follows:

South Africa beneficiaries:

- 1) Maximum 1200€ for travel, health insurance, food and accommodation (except for members of South Africa-University of the Witwatersrand, Johannesburg)

Non-South Africa beneficiaries:

- 1) Maximum 1500€ for visa, health insurance, food and accommodation
- 2) Maximum 1500€ for flight tickets

Note: a compensation is possible between the cost groups 1) and 2).

REQUIREMENTS AND APPLICATION PROCEDURE

To be eligible, candidates must meet the following requirements:

- Being members of the academic staff of one of the listed universities (target audience section of this document)
- Pursuing academic work in fields relevant to the course
- Providing a self-certification of knowledge of English language (at least B2 level)

Application Submission: Deadline: 1st September 2025

To submit an application for enrolment, candidates must complete the online application form available at:

https://docs.google.com/forms/d/e/1FAIpQLSdgDRGhqo9RBnmt_k0OeeVZaJvIEbgET257LaIUlctTL_KPxg/viewform?usp=dialog

The application must include:



- Proof of affiliation with one of the listed institutions
- Completed application form
- A Curriculum Vitae (including a list of publications)
- A motivation letter
- Self-certification of English language knowledge or official certification of English language knowledge (at least B2)

SELECTION PROCEDURE

The selection of candidates will be carried out on a 100-point scale, distributed as specified in the evaluation criteria. A merit ranking will be established based on the scores obtained, and admission to the course will be granted to candidates with the highest scores until all available places are filled.

1. Relevance of CV to the course objectives: Max. 40 points.

- Fully Relevant:** The item is directly and entirely aligned with the specified topic of the course
- Mostly Relevant:** The item is significantly aligned with the specified topic of the course with only minor deviations.
- Partially Relevant:** The item is somewhat aligned with the specified topic of the course but with notable gaps or inconsistencies.
- Not Relevant:** The item has no discernible alignment with specified topic of the course

2. Publications relevant to the course topic: 2 points per publication, Max. 20 points.

3. Teaching and leadership experience: Max. 10 points.

- Teaching hours per year
- Institutional assignments (coordinators, directors, etc.)

4. Motivation letter: Max. 10 points.

5. The career time perspective will be considered, with preference given to individuals who have a longer-term career trajectory. Max. 20 points.

Age of the candidate	Pts
25-35	20
36-45	15
46-55	10
More than 55	5

Gender will be taken into account during the selection process. In cases where two candidates have equal qualifications and scores, preference will be given to promote gender balance and to the younger applicants

Selection Committee

The Selection Committee will consist of:

- At least one Administrative Staff member from the University of Ferrara
- At least two UNIFE professors responsible for organizing the course.

The final ranking will be communicated to all applicants. The Selection Committee will evaluate the submitted applications and compile a ranking list, which will be communicated to the participants in the competition by **the end of September 2025**.

Grounds for Rejection

The host university reserves the right to refuse staff for the mobility grant on the basis of objective impediments that are inconsistent with its regulations. These may include:

- a) Failure to submit the required information of the selected staff within the stipulated deadline;
- b) Non-compliance with the application procedures set forth by the sending university;
- c) Failure to meet the language proficiency requirements specified by the partner institution;
- d) Incompatibility between the proposed teaching plan and the educational offerings of the host institution;
- e) Issues related to entry and stay regulations in the host country.

POST-SELECTION REQUIREMENTS

Selected candidates must confirm their acceptance within 10 days of notification by sending the acceptance to the University of Ferrara, copying the message to their home university.

Upon acceptance, the following steps will be required:

1. Define and sign the Mobility and Financial Agreement.
2. Comply with the administrative requirements of the hosting institution (University of Ferrara)

Withdrawal from the mobility grant may be made provided it occurs prior to the purchase of the flight tickets and the disbursement of the planned funding. Any withdrawal after these steps will necessitate full reimbursement of the funds already allocated.

FURTHER INFORMATION

For any additional information, clarifications or inquiry, please do not hesitate to contact:

Guido Sciavicco : guido.sciavicco@unife.it

Cc: alessia.bitti@unife.it

Approvato con delibera del Consiglio di Amministrazione nella seduta del 23 luglio 2025 (approved by Unife's Board on 23rd July 2025)