

**Logic**

Code: 100314  
ECTS Credits: 6

Degree	Type	Year	Semester
2500246 Philosophy	OB	2	1

**Contact**

Name: María Pilar Dellunde Clave  
Email: pilar.dellunde@uab.cat

**Use of Languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: No

**Teachers**

María Pilar Dellunde Clave  
Roger Deulofeu Batllori

**Prerequisites**

None.

**Objectives and Contextualisation**

How can an artificial intelligence represent knowledge? Logic is an interdisciplinary study that plays a very important role in answering current questions of this nature. The aim of this subject is, first of all, to make an introduction to the fundamental logical notions: logical consequence, satisfaction, consistency and logical equivalence. Secondly, the aim is to provide students with the basic techniques for the logical analysis of deductive reasoning, with special attention to philosophical reasoning. The subject, however, can be taken by people from other specialties. The nature of the subject is fundamentally practical, but it will also reflect on the main problems of Philosophy of Logic, introducing a historical perspective that takes us from Aristotle to today's artificial intelligence. Throughout the course we will use different tools, such as deductive games and immersive role-playing games, which aim to enhance creativity in philosophical argumentation.

**Competences**

- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- Using the symbology and procedures of the formal sciences in the analysis and building of arguments.

## Learning Outcomes

1. Ability to maintain an appropriate conversation.
2. Autonomously searching, selecting and processing information both from structured sources (databases, bibliographies, specialized magazines) and from across the network.
3. Correctly, accurately and clearly communicating the acquired philosophical knowledge in oral and written form.
4. Effectively communicating and applying the argumentative and textual processes to formal and scientific texts.
5. Explaining the specific notions of the History of Philosophy.
6. Formulating arguments for and against an issue, using proper vocabulary, conceptual precision and argumentative coherence.
7. Recognising and implementing the following teamwork skills: commitment to teamwork, habit of cooperation, ability to participate in the problem solving processes.
8. Regularising arguments of any source and calculating its logical correctness.
9. Solving problems autonomously.

## Content

1. Introduction to formal logic.
2. Propositional logic: First steps towards symbolization. Connectives.
3. Semantics of propositional logic. Assignments of truth values. Truth tables. Tautologies, contradictions and contingent formulas.
4. Satisfaction and logical consequence. Logical equivalence.
5. Natural deduction for propositional logic
6. Syntax of first order logic.
7. Semantics of first order logic. Structures. Truth in a structure.
8. History and Philosophy of Logic: from Aristotle to Artificial Intelligence

## Methodology

- Combination of theoretical and practical classes.
- Deductive games
- Philosophical immersive role-playing games
- Joint resolution of exercises.
- Self-learning activities.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Deductive games workshop	20	0.8	2, 3, 4, 6, 1, 7, 9
Solve problems in classroom	29	1.16	8, 6
Type: Supervised			
Deductive games workshop work	26	1.04	2, 3, 4, 6, 1, 7, 9
Type: Autonomous			

Solve problems	30	1.2	8, 9
Study of concepts	25	1	8, 6, 9

## Assessment

There are three evaluation activities: two synthesis tests, and a series of exercises within a writing workshop. The first test will evaluate the content on propositional logic, and will be worth 45% of the grade; the second test will evaluate the contents of first-order logic, and will be worth 45% of the grade. The exercises done in the writing workshop will be worth 10% of the grade.

The two logic tests will be carried out, one in November, and the other in December. The third activity will be done throughout the course. At the time of carrying out each evaluation activity, the teacher will inform the students (via Moodle) of the procedure and date of review of the qualifications.

In order to participate in the final exam, students must first be evaluated in the two synthesis tests, and have obtained a minimum of 3 points (adding the results of the two tests). "Non-evaluable" will be considered only those who have not performed any of the three evaluation activities.

In the event of a student committing any irregularity that may lead to a significant variation in the grade awarded to an assessment activity, the student will be given a zero for this activity, regardless of any disciplinary process that may take place. In the event of several irregularities in assessment activities of the same subject, the student will be given a zero as the final grade for this subject.

In the event that tests or exams cannot be taken onsite, they will be adapted to an online format made available through the UAB's virtual tools (original weighting will be maintained). Homework, activities and class participation will be carried out through forums, wikis and/or discussion on Teams, etc. Lecturers will ensure that students are able to access these virtual tools, or will offer them feasible alternatives.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Classroom practices	20%	15	0.6	3, 5, 4, 8, 1, 9
Deductive games workshop work	30%	3	0.12	2, 4, 6, 1, 7, 9
Synthesis Test	50%	2	0.08	3, 5, 8, 6, 9

## Bibliography

Mandatory: P. D. Magnus, Forallx, University at Albany, State University of New York, 2021.  
<https://forallx.openlogicproject.org>

Optional:

1. C. Badesa, I. Jané, R. Jansana, *Elementos de lógica formal*, Ariel, 2007.
2. J. Barwise and J. Etchemendy, *The Language of first-order logic*, 3era ed., Center for the Study of Language and Information, cop. 1992.
3. Coursera Course: *Logic, language and information*.  
<https://www.coursetalk.com/providers/coursera/courses/logic-language-and-information-1>
4. Stanford Encyclopedia of Philosophy: <http://plato.stanford.edu/>
5. Gateway to Logic. <http://logik.phl.univie.ac.at/~chris/gateway/formular-uk.html>
6. The Logic Café, <http://thelogiccafe.net/PLI/>

## **Software**

No specific software is needed