

## Logic Programming (C003783)

**Course size** *(nominal values; actual values may depend on programme)*

**Credits 6.0**

**Study time 180 h**

**Course offerings and teaching methods in academic year 2024-2025**

A (semester 2)

Dutch

Gent

seminar

lecture

**Lecturers in academic year 2024-2025**

Scholliers, Christophe

WE02

lecturer-in-charge

**Offered in the following programmes in 2024-2025**

[Bachelor of Science in Computer Science](#)

**crdts**

6

**offering**

A

**Teaching languages**

Dutch

**Keywords**

Programming languages, Logic programming, Backtracking, Unification, Prolog

**Position of the course**

The student immerses himself in logical programming paradigms.

It is intended that she / he:

- masters the practical use of a logical programming language;
- masters the concepts, programming techniques and data structures that are common in this paradigm;
- acquires insight into the connections between logic programming, functional programming and object-oriented programming
- gains insight into the underlying evaluation mechanisms of this language

**Contents**

- taal: SWI Prolog, notions of other logic programming languages
- execution mechanisms: unificatie, backtracking, lazy evaluation
- data structures: graphs, cyclic data structures
- meta interpreters
- forward vs backward chaining
- programming with constraints
- Natural deduction and semantics of predicate logic

(Not all topics will be covered every year)

**Initial competences**

Being able to program in a functional programming language like Haskell.

**Final competences**

- 1 The student understands the syntax and semantics of first-order logic.
- 2 He/she recognizes which logical problems can be tackled with propositional or predicational logic and which can't.
- 3 The student can write small to mid sized programs in a logical programming language.
- 4 The student understands the datastructures of the language and can apply them in a project.
- 5 He/she can apply tools for automated reasoning.

**Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

### **Conditions for exam contract**

This course unit cannot be taken via an exam contract

### **Teaching methods**

Seminar, Lecture

### **Extra information on the teaching methods**

Theory: Lectures, Exercises: Lectures with discussion, Seminar: coached exercises on PC.

### **Study material**

Type: Handbook

Name: Clocksin, William F., and Christopher S. Mellish. \*Programming in PROLOG\*. Springer Science & Business Media, 2003'

Indicative price: € 65

Optional: no

Type: Handbook

Name: Sterling, Leon, and Ehud Y. Shapiro. \*The art of Prolog: advanced programming techniques\*. MIT press, 1994'

Indicative price: Free or paid by faculty

Optional: yes

### **References**

### **Course content-related study coaching**

The theory is explained in detail during the lectures. Additional explanations can be obtained when necessary. The seminars and practical exercise sessions are aimed at enhancing the understanding of the theoretical principles. An electronic learning environment supports the communication between students and teachers. Feedback after the project work allows monitoring of the individual study progress for the course. Lecturer and assistant are available for the student who have questions about the theory or the exercises.

### **Assessment moments**

end-of-term and continuous assessment

### **Examination methods in case of periodic assessment during the first examination period**

Written assessment

### **Examination methods in case of periodic assessment during the second examination period**

Written assessment

### **Examination methods in case of permanent assessment**

Assignment

### **Possibilities of retake in case of permanent assessment**

examination during the second examination period is possible

### **Extra information on the examination methods**

The students are evaluated on a project assignment. Furthermore there is theory-exam which verifies whether the student masters the treated course materials.

### **Calculation of the examination mark**

1st exam: periodic (50%) and permanent (50%) evaluation.

When a student obtains a grade less than 10/20 for either the theory or the project, the total end grade will be maximally the highest failing grade 9/20.

If the student does not pass the non-periodical evaluation, it can be retaken with a new project assignment.