

## DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE


 Summer School in  
 Knowledge Representation and  
 Reasoning

**Speakers:** *Francesco Calimeri*, *Norm Krumpe*, *Francesco Ricca*

**Abstract:**

This course will expose students to established techniques for representing common sense knowledge in a language that machines can understand and use in automated reasoning. Students will study a logical language for knowledge representation, Answer Set Prolog (ASP), and methods for using ASP to encode different types of knowledge. They will apply ASP reasoning algorithms for solving complex tasks. Students will learn about practical applications of ASP created by the research group at University of Calabria.

*Programme*

1. What is Computer Programming?

A brief history of computing and programming

- Logo and Lisp
- Java and Processing
- Prolog

2. What is Knowledge Representation?

What is Artificial Intelligence?

Guest speaker: Prof. Francesco Calimeri

- The Turing test
- The Winograd schema challenge

3. Answer Set Programming (ASP)

Guest speaker: Prof. Francesco Ricca

- Datalog
- Special features of ASP.
- Formal semantics of ASP
- The Gelfond-Lifschitz reduct
- Weak constraints, aggregates,
- "Guess and check" methodology

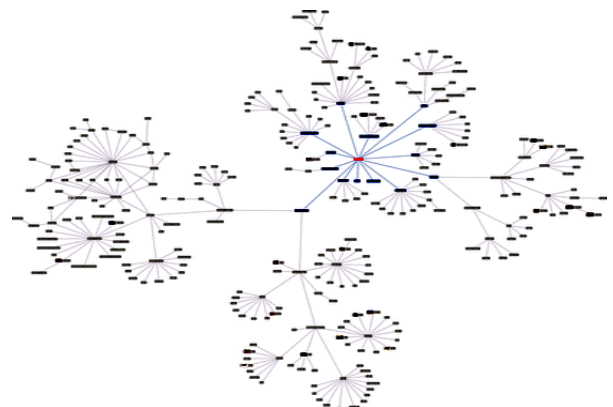
4. Logic-based intelligent agent design

5. Modeling dynamic domains in ASP

6. Temporal Projection, Question Answering and Planning in ASP

7. Reasoning about defaults in ASP

8. Applications of ASP



**Period**  
 May and June 2017

**Room**  
 MT12- 30B