

Knowledge Graph Engineering

Knowdive Research Group

September 3, 2024

Part 0

Course Organization

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- 2 Part 1 - The Reuse Problem
- 3 Part 2 - State of the Art
- 4 Part 3 - Knowledge Graphs
- 5 Part 4 - Entity Base
- 6 Part 5 - The iTelos Methodology
- 7 Part 6 - KG Evaluation and Exploitation

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Objectives

- Learn what it is and how to build a Knowledge Graph (KG).
- Learn how to use, and re-use, high quality and reusable data.
- Learn how to represent diverse, and purpose-specific information.
- Learn a methodology to build quality and reusable KGs.
- Learn tool and instruments to implement the above methodology.

Prerequisites

- **Data management:** basic programming skills in python and/or java/javascript.
- **Databases modeling:** ER modeling, Ontology modeling if possible, Ontology definition desirable.
- **Attitude to teamwork.**

Course Modality - The Theory

The theory enables the practice

The theory lectures will be focused on:

- First part of the course:
 - Data Representation
 - Data Heterogeneity
 - Data Diversity
- Second part of the course:
 - Entity data representation
 - Knowledge Graph Construction (KGC)
 - iTelos methodology for KGC

Course Modality - The Practice

The course practical activities apply the iTelos methodology in real-world case studies.

- The course starts with 2.5 weeks of theoretical introduction. Then, from the third week, the course will include parallel lectures for both theory and practice.
- The practical lectures aim to explain how to concretely apply the iTelos methodology over real-world projects assigned to student groups.

Course Modality - Following the course

- The theoretical lectures describe the problems to solve, and the solutions proposed by the iTelos methodology;
- The practical lectures describe how to implement your projects, following the iTelos methodology.
- The students (grouped in teams) will have to implement a complete KGC project (focused on real case studies assigned by tutors).

It is strongly suggested:

- The presence in the classroom for the theoretical lectures and their following discussions.
- Ask questions in class!
This will help you to know what you didn't understand.
- Strong cooperation between the team members is required to carry on the project's development along the course.

Exam Modality - Intermediate evaluations

- After the completion of each iTelos phase (both concerning theory and practice) the students will have to provide an **intermediate report** of the work done so far.
- The intermediate report will be evaluated, allowing the tutors to lead the teams towards the right direction by correcting possible errors during the methodology implementation.
 - Moreover, the evaluation of the intermediate reports, will be considerde for the final vote.

Exam Modality - Final evaluation

- The final exam will consist of a presentation of the KGE project developed along the course and finalized achieving the output which fulfills the initial project's purpose.
- Additional questions will be asked by the tutors over both the course theory and practice.
- The course final grades will be composed by the grades obtained for each intermediate evaluations plus the final presentations grade.