FACULTY OF MATHEMATICS PHYSICS AND INFORMATICS
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Matfyz Ontology

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1. Introduction

1.1 Purpose

This ontology is designed to organize and structure information about the faculty in a way that can be understood by both machines and people. It defines important elements as well as the relationships between them.

The main goals of the ontology is to help with connecting course requirements to degrees as well as finding and relieving situations where the workload on persons might be difficult to manage.

1.2 Scope

This ontology covers important parts contained within the faculty such as:

- Building and Rooms
- Academic Staff and categorisations of Students
- Academic programs, Courses and Departments they're under
- Relationships that connect them

However this ontology **does not** cover the following:

- Personal student records nor their grades and other such data
- Non-academic staff
- Real time scheduling of events within the faculty

2. Design

2.1 Competency questions

2.1.1 Places

- What buildings does the faculty have?
- How many rooms does each building have?

2.1.2 People

- Who are the people comprising the academic staff?
- Which staff members teach which specific courses?
- Which office does a specific staff member occupy?

2.1.3 Programs, Degrees and Courses

- What degree programs does the university offer?
- Which courses are part of a specific degree program?
- What type of credits does a course offer in different programs?

2.2 Sources

For this ontology we took information from the websites provided by the faculty

itself as it is the most up-to-date and reliable source available.

- https://fmph.uniba.sk/pracoviska
- https://fmph.uniba.sk/programy
- https://fmph.uniba.sk/studium/magisterske-studium
- https://candle.fmph.uniba.sk/miestnosti
- https://sluzby.fmph.uniba.sk/infolist/sk

2.3 Constraints and Limitations

2.3.1 Logical constraints

- A student must be enrolled in exactly one program
- A staff member must teach some course and fall under exactly one department
- A course must be taught by some staff member
- A building must contain some room
- etc.

2.3.2 Scope limitations

- The ontology does not store grades or personal student data
- Non-academic staff are not included due to lack of data
- The ontology itself does not handle any room assignments or scheduling

2.4 Tools Used

- Protegé - visualizing the ontology
- Python - gathering and adding information to the ontology

3. Implementation

3.1 Structure (Juráška)

3.1.1 Classes

- Places - Building, Room + subclasses
- Staff - Division of academic staff members
- Students - Bachelor, Master, PhD
- Degrees - types of study programs
- Departments
- Courses

3.1.2 Object properties

- Room, People placement
- Course-Teacher assignment
- Course-Degree connection with type of credit given

3.2 Gathering data (Beluško, Juráška)

To build a well-structured faculty ontology, we first needed to collect relevant data. This step primarily involved web scraping data from available sources and transforming it into a usable format using Python.

3.3 Adding the data (Beluško)

The next step was to populate it with individuals from the gathered data and interconnecting them using object properties. This was done using Python libraries that support RDF and OWL manipulation.