Medical Information Models and Ontologies

Programme course

6 credits

Medicinska informationsmodeller och ontologier

TBMI03

Valid from: 2019 Spring semester

Determined by
Board of Studies for Electrical Engineering, Physics and Mathematics

Date determined
2018-08-31
Course level

Second cycle

Advancement level

A1X

Course offered for

- Master's Programme in Biomedical Engineering
- Computer Science and Engineering, M Sc in Engineering
- Information Technology, M Sc in Engineering
- Biomedical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, M Sc in Engineering
- Applied Physics and Electrical Engineering, M Sc in Engineering

Specific information

The course is offered every second year, even years. The course is temporarily suspended 2018.

Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites

Basic knowledge of anatomy and physiology, basic knowledge of medical informatics (corresponding to Medical Information Systems)

Intended learning outcomes

This course lets the student go deeper into the area of semantic interoperability among health care information systems, i.e. the issue of communication based on the meaning of the information. The overall aim is that participants should acquire knowledge and skills in order to be able to reason about the possibilities and prerequisites for automated
processing of patient data stored in disparate information systems. After completing the course, students are expected to be able to independently:

- Create information models based on given scenarios
- Discuss different ways of dividing an information system into components
- Describe different ways of interconnecting information models and ontologies
- Describe ongoing international standardization efforts and collaborative development projects
- Describe how terminologies and ontologies can be categorized and analyze the impact of their properties in different scenarios
- On a general level explain how language logics are classified and how their properties influence the creation and use of formal concept representations
- Apply tools for implementing and editing information models and ontologies

Course content

- Information models, process models, inference models, and ontologies
- openEHR and ISO/EN 13606: architecture, archetypes, and templates
- HL7 v3: RIM, CDA, and DCM
- Compound information models
- Classification, terminology, and ontology: history, properties, and applications
- Pre- and postcoordinated terminologies
- Mapping and ontology alignment
- Medical language processing
- Semantic Web(s)
- Description logics, semantics, and expressive power
- RDF, XML, and Web Ontology Language (OWL)
- SNOMED CT and IHTSDO
- Standardization: organizations, processes, and results

Teaching and working methods

The course consists of lectures, seminars, laboratory experiments, and home work.

Examination

| TEN1 | Written examination | U,3,4,5 | 3 credits |
LABI Laboratory work U,G 3 credits

Grades
F, 3, 4, 5

Subject area
Other Subjects within Technology

Disciplinary domain
Technology

Department
Department of Biomedical Engineering (IMT)

Director of Studies or equivalent
Marcus Larsson

Examiner
Håkan Örman

Education components
Preliminary scheduled hours: 42 h
Recommended self-study hours: 118 h