

# Medical Information Models and Ontologies

Programme course

6 credits

Medicinska informationsmodeller och ontologier

TBMI03

Valid from: 2017 Spring semester

**Determined by**

Board of Studies for Electrical  
Engineering, Physics and Mathematics

**Date determined**

2017-01-25

## Main field of study

Biomedical Engineering

## Course level

Second cycle

## Advancement level

A1X

## Course offered for

- Computer Science and Engineering, M Sc in Engineering
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- Applied Physics and Electrical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, M Sc in Engineering

## 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

LAB1	Laboratory work	3 credits	U, G
TEN1	Written examination	3 credits	U, 3, 4, 5

## Grades

Four-grade scale, LiU, U, 3, 4, 5

## Department

Institutionen för medicinsk teknik

## Director of Studies or equivalent

Marcus Larsson

## Examiner

Håkan Örman

## Course website and other links

<http://www.imt.liu.se/edu/courses/TBMIo3>

## Education components

Preliminary scheduled hours: 42 h

Recommended self-study hours: 118 h

## Course literature

Taylor P. From patient data to medical knowledge: the principles and practice of health informatics. Malden (MA): Blackwell Publishing; 2006.

Komletterande kompendium

Referenslitteratur (standardiseringsdokument)

## Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at [http://stydokument.liu.se/Regelsamling/Innehall/Utbildning\\_pa\\_grund-\\_och\\_avancerad\\_niva](http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva).