

SYLLABUS

Artificial Intelligence within the Healthcare System 7.5 credits M7016H

Artificiell intelligens inom sjukvården

Course syllabus admitted: Autumn 2023 Sp 1 - Present

**DECISION DATE
2022-02-14**

Artificial Intelligence within the Healthcare System 7.5 credits M7016H

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Second cycle, M7016H

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	U G#	Medicinsk teknik	Other Subjects within Technology

Entry requirements

D0033E Maskininlärning och mönsterigenkänning, 7,5 hp

Selection

The selection is based on 30-285 credits

Course Aim

After passing the course, the student should be able to describe the different medical decision support systems used in Swedish hospitals, and the information on which these are based. Furthermore, the student should be able to present and explain the essential parameters that form the basis of a patient record and describe how these can be linked to different types of decision support systems.

The student should also be able to demonstrate the ability to develop a simple concept for an intelligent medical decision support system for a specific disease, and apply this to a small set of simulated health data.

The student should furthermore be able to evaluate which areas of health care where AI-based medical technology solutions have great potential to be useful, and to assess the challenges associated with the introduction of new medical technologies in health care.

Contents

Artificial intelligence (AI) will be an important part of tomorrow's healthcare systems in most developed countries. With new medical technology tools for early detection and prevention of diseases, health data can be used systematically and strategically to keep us healthier for longer throughout our lives and to detect various diseases or risk of diseases at a very early stage. Intelligent medical decision support systems enable healthcare providers to work more efficiently and provide the right support at the right time. This course will introduce students to the basic concepts of medical decision support systems currently used in major Swedish hospitals. The course will also include and explain important parameters such as prevalence, sensitivity, specificity, predictors, and the meaning of evidence-based healthcare. Based on the knowledge of AI that students have already acquired in the programme, they will develop a simpler concept of intelligent medical decision support system for a specific disease (e.g. heart failure, cancer or pain) by taking into account important parameters in healthcare, and present this to their fellow students. The course also addresses how new medical aids, such as AI-based support systems, can be implemented within the Swedish healthcare system and the challenges associated with the introduction of new medical technologies in healthcare.

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The teaching consists of lectures where students are trained in different concepts used in health care related to information management. Through project work where students are asked to develop a simple concept for AI-based medical decision support, their skills are trained in collaborating on the development of algorithms that can be applied to simulated health data. Furthermore, students are trained in written and oral presentation of their completed project work. Through guest lectures, students are trained to gain an understanding of the challenges associated with the introduction of AI-based medical decision support in healthcare, and to be able to evaluate in which areas AI-based medical technology solutions have great potential to create benefits.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. The course is examined by written individual examination and completed project work. Grading is according to the U G scale. A passing grade requires that all learning outcomes have been met.

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Course offered by

Department of Health, Education and Technology

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Written individual exam	U G#	5	Mandatory	S23	
0002	Project work	U G#	2.5	Mandatory	S23	

Last revised

by Anna Öqvist, Director of Undergraduate Studies at the Department of Health, Education and Technology 2022-02-14

Syllabus established

by Anna Öqvist, Director of Undergraduate Studies at the Department of Health, Education and Technology 2022-02-14