Course syllabus for

Artificial Intelligence in Mental Healthcare, 3 credits

Artificiell intelligens inom mental hälso- och sjukvård, 3 hp
This course syllabus is valid from spring 2024.
Please note that the course syllabus is available in the following versions:
Spring2024 , Spring2025

Course code	1QA142
Course name	Artificial Intelligence in Mental Healthcare
Credits	3 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Not applicable
Level	First cycle, in-depth level of the course cannot be classified
Grading scale	Pass, Fail
Department	Department of Clinical Neuroscience
Decided by	Education committee CNS
Decision date	2023-12-13
Course syllabus valid from	Spring 2024

Specific entry requirements

A minimum of 60 credits in health care or medicine. And proficiency in English equivalent to English B/English 6.

Objectives

Objective
The purpose of the course is to introduce the topic of artificial intelligence (AI) focused on theoretical development and practical application in mental healthcare and to stimulate a scientific approach.

Learning outcomes
The student will after completed course be able to understand opportunities and challenges that contemporary AI-tools offer in context of clinical psychology and psychiatry, including:

Knowledge and understanding

- Identify strengths and limitations of man versus machine and how the clinician of tomorrow may be a combination of both
- Articulate and discuss ethical considerations with respect to the development and implementation

of AI tools
- Describe the basic concepts of conversational agents (chatbots) for online psychotherapy
- Give examples of machine learning applications in mental healthcare

Skills

- Use an AI-tool to produce speech-to-text, text-to-text, text-to-visual output
- Contribute to the development of a machine learning model
- Present orally and in writing the strengths and limitations of that particular model
- Communicate ethical challenges posed by clinical AI implementation examples

Approach

- Get acquainted with suitable scientific literature in the field of AI-focused digital healthcare
- Get exposed to critical quality assessment of said literature.

Content

The course provides a comprehensive interdisciplinary perspective on both opportunities and challenges of AI in mental healthcare. Using theory and real-world examples, students will gain insight into the particular strengths and limitations of humans versus machines. Focus areas include conversational agents, suicide prediction, and applied machine learning for the purpose of improved tailored treatment, monitoring, and care. These topics will also be studied and debated from an ethical perspective. Lectures will be supported by collaborative seminars on cutting-edge findings. Interactive workshops will provide possibilities for both theoretical development and hands-on construction of AI-tools.

Teaching methods

The work format in the course involves both teacher-supported and individual study sessions. The teacher-supported activities consists of lectures, workshops, journal club with seminar discussion, and in parts the group project work. Independent study is done in the form of self-study, reflection, reading, and project work. The group project work will render oral and written output. There will be an individual multiple-choice test. Continuous learning will be stimulated through active participation in discussions.

Examination

The course is examined through one multiple choice exam and a group project report, including its oral presentation. The course will be held on site and presence is mandatory. Re-exam opportunity follows standard practices.

Absence from or non-fulfillment of mandatory course elements
The examiner decides whether, and if so how, absence from or unfulfillment of compulsory course elements can be made up for. Study results cannot be reported until the student has participated in or fulfilled compulsory course elements, or compensated for any absence/ failure to fulfill in accordance with instructions from the examiner. Absence from or unfulfillment of a compulsory course element may imply that the student can not retake the element until the next time the course is offered.

Possibility of exemption from the syllabus' regulations on examination
If there are special grounds, or a need for adaptation for a student with a disability, the examiner may decide to deviate from the syllabus' regulations on the examination form, the number of examination

opportunities, the possibility of supplementation or exemptions from the compulsory section/s of the course etc. Content and learning outcomes as well as the level of expected skills, knowledge and attitudes may not be changed, removed or reduced.

Transitional provisions

If the course is cancelled or goes through substantial changes, information about interim regulations will be stated here.

Other directives

The course is offered exclusively in English.

Course evaluation will be carried out in accordance with the guidelines established for education at Karolinska Institutet.

Literature and other teaching aids

Obligatory literature

Obligatory literature

McCradden, M; Hui, K; Buchman, D. Z
Evidence, ethics and the promise of artificial intelligence in psychiatry

2023
URL: Länk
Ingår i:
Journal of medical ethics : journal of the Society for the study of medical ethics

London : The soc., 1975-
ISSN:0306-6800 LIBRIS-ID:8260978
49 (2023) :8, s. 573579

Building machines that learn and think like people
Lake, Brenden M; Ullman, Tomer D; Tenenbaum, Joshua B; Gershman, Samuel J

2017
URL: Länk
Ingår i:
The behavioral and brain sciences : an international journal of current research and theory with open peer commentary

Cambridge : Cambridge U.P., 1978-
ISSN:0140-525X LIBRIS-ID:3490698
(2017) s. 253

Jordan, M.I; Mitchell, T. M
Machine learning: Trends, perspectives, and prospects

2015
URL: Länk
Ingår i:
Science

Washington,c 1883- : 1883-
ISSN:0036-8075 LIBRIS-ID:8258315
URL:
http://www.du.se/proxy.aspx?=http://search.ebscohost.com/login.aspx?direct=true&db=afh&jid=SCI&site
Fulltext online (1997-2004)
349 (2015) :6245, s. 255-260

Shmueli, Galit
To Explain or to Predict?
2010
URL: Länk
Ingår i:
Statistical science : a review journal of the Institute of Mathematical Statistics
Beachwoof : Institute of Mathematical Statistics, 2000-
LIBRIS-ID:9994290
25 (2010) s. 289-310

Recommended other literature

The elements of statistical learning : data mining, inference, and prediction
Hastie, Trevor; Tibshirani, Robert; Friedman, Jerome; Bagley, Cindee
Johanneshov : MTM, 2018 - 2 CD-R (56 tim., 19 min.)
LIBRIS-ID:19hd9694zg2s7f70

Other obligatory literature, including articles and other learning material is provided via the learning platform