

SYLLABUS

Intelligent Technology - Computational Neuroscience I 15 credits P0065A

Framtidens intelligenta teknik - Teoretisk neurovetenskap I

Course syllabus admitted: Spring 2018 Sp 3 - Spring 2019 Sp 4

**DECISION DATE
2017-06-01**

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Framtidens intelligenta teknik - Teoretisk neurovetenskap I

First cycle, P0065A

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	U G#	Teoretisk neurovetenskap	Other Subjects within Technology

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and P0008A Intelligent Technology Cognitive Science and P0012A Intelligent Technology Computation & the Brain. Alternatively, corresponding knowledge acquired by university studies and/or working experience.

Selection

The selection is based on 1-165 credits.

Examiner

Peter Bengtsson

Course Aim

Fundamental knowledge and skills in Computational Neuroscience. The student is to integrate and elaborate upon knowledge gained from previous university courses in cognitive and biological neuroscience. Furthermore, the student will attain skills in simulating the information processes of the brain by means of computational models. The course is for everyone who wants to learn about a highly topical and exciting field of research.

Contents

Integration of the course content in P0008A Intelligent Technology – Cognitive Science and P0012A Intelligent Technology – Computation & the Brain, implying an elaboration upon knowledge about the neurological base for perception, cognition, emotion, action and motor control. Additionally, mathematical, computational and neural network models are used to simulate the information processes of the brain. One example of such a process is the treatment of information in the primary visual cortex, which can be simulated by means of Hebb's law. The law postulates that when a neuron A activates a second neuron B, the synaptic coupling between the two neurons is strengthened.

Realization

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

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. Assignments and laboratory sections.

Remarks

Students must register for the courses themselves, or contact ETKS educational administration eduetks@ltu.se, not later than three days after the quarter commences. Failure to do so can result in the place being lost. This rule also applies to students with a guaranteed place.

Taught in Swedish and English.

Associated courses in Intelligent Technology are:
P0008A Intelligent Technology of the future – Cognitive science;
P0012A Intelligent Technology – Computation & the Brain;
P0065A Intelligent Technology – Computational Neuroscience I;
P7010A Intelligent Technology – Cyborgs & Humanoid Robots;
P7045A Intelligent Technology – Neuroscience & Mathematics;
P7034A Intelligent Technology – Computational Neuroscience;
P7023A Intelligent Technology – Scientific Work.

Literature. Valid from Autumn 2014 Sp 1

Trappenberg, T. P. (2010). Fundamentals of Computational Neuroscience. 2nd Edition.
Additional literature will be added according to the teacher's instructions.

Course offered by

Department of Business Administration, Technology and Social Sciences

Items/credits

Number	Type	Credits	Grade
0001	Assignment report and laboratory work	15	U G#

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Director of Undergraduate Studies Daniel Örtqvist, Department of Business Administration, Technology and Social Sciences 2017-06-01

Syllabus established

by Director of Undergraduate Studies Bo Jonsson, Department of Business Administration, Technology and Social Sciences 2014-02-14