

SYLLABUS

Intelligent Technology - Neuroscience & Mathematics 15 credits P7045A

Framtidens intelligenta teknik - Neurovetenskap & matematik

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

**DECISION DATE
2017-06-01**

Intelligent Technology - Neuroscience & Mathematics 15 credits P7045A

Framtidens intelligenta teknik - Neurovetenskap & matematik

Second cycle, P7045A

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

Entry requirements

Minimum of 90 ECTS in technology, medicine and/or natural sciences. Alternatively, minimum of 90 ECTS including one of the courses P0008A Intelligent Technology of the Future - Cognitive Science or P0012A Intelligent Technology - Computation & the Brain. University courses in basic algebra and calculus equivalent to 15 ECTS, or corresponding knowledge acquired by university studies and/or working experience, are recommended.

Selection

The selection is based on 30-285 credits

Examiner

Peter Bengtsson

Course Aim

The student gains understanding of the brain from cell to network. In parallel, the student learns how to use current computational and mathematical models of the nerve cell and the information processing by neural networks. The course is for everyone who wants to learn about a highly topical and exciting field of research. Advanced knowledge and skills in neuroscientific computation and simulation.

Contents

In incremental computer experiments the course covers and integrates computational models from the nerve cell components to networks, moving from the simple to the complex. The course includes modeling of nerve cell processes by differential equations and linear algebra, synaptic transmission by probabilistic methods and system level neuroscience by signal processing theory.

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

Gabbiani, F. & Cox, S. J. (2010). Mathematics for Neuroscientists. 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, 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