



**Karolinska  
Institutet**

Course syllabus for

## **Cognitive Processes, 15 credits**

Kognitiva processer, 15 hp

This course syllabus is valid from spring 2024.

Please note that the course syllabus is available in the following versions:

[Spring2013](#) , [Spring2014](#) , [Spring2015](#) , [Spring2016](#) , [Spring2017](#) , [Spring2020](#) , [Spring2022](#) , [Spring2023](#) , Spring2024

Course code	2PS029
Course name	Cognitive Processes
Credits	15 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Psychology
Level	G2 - First cycle 2
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Clinical Neuroscience
Decided by	Programnämnd 8
Decision date	2012-11-06
Revised by	Education committee CNS
Last revision	2024-09-25
Course syllabus valid from	Spring 2024

## **Specific entry requirements**

Passed results of the first semester (at least 7,5 credits) of the Study Programme in Psychology.

## **Objectives**

### ***Module 1, Statistics***

#### ***Learning goals***

On completion of the course, the student should be able to

- discuss and use the meaning of descriptive statistical concepts (e.g. various measures of dispersion and measures of central tendency) as well as concepts central to statistical inference (e.g. statistical power, p-value, significance, sampling distribution)
- independently analyse behavioral data with an emphasis on comparisons between groups by means of analyses of variance methodology.

#### ***Skills and attitudes***

On completion of the course, the student should be able to

- identify and justify appropriate descriptive and inferential statistical methods, given a data set or research question
- perform and interpret calculations (e.g. correlation, ANOVA)
- use the statistics program Jamovi

## ***Module 2, Cognition***

### *Learning goals*

On completion of the course, the student should be able to

- define the concepts of cognition and cognitive neuroscience and briefly describe the historical development of the subject and its current status as scientific subject
- account for central concepts, theories and methods within cognitive psychology (e.g. brain imaging, cognitive plasticity, memory functions, languages, visuospatial ability, intelligence, executive functions, problem solving and decision making)
- account for the neurobiological basis for the above functions
- account for individual differences (e.g. sex, age) and conditions (e.g. sleep) in relation to cognitive processes.

### *Skills and attitudes*

On completion of the course, the student should be able to

- reflect on how to handle test situations and test results with a starting point in his/her initial experience of administrating cognitive tests.

## ***Module 3, Integration of cognition and statistics***

### *Learning goals*

On completion of the course, the student should be able to

- account for important concepts and principles within the framework of research on cognitive processes (eg experimental manipulation, informed consent and statistical argumentation/inference).

### *Skills and attitudes*

On completion of the course, the student should be able to

- design experimental studies
- analyze collected behavioral data with variance analysis methodology
- carry out a scientific experiments and report this in writing
- critically review own and others' results and show understanding of the meaning of statistical significance
- demonstrate the ability to reflect on research ethics, based on their initial experience of collecting and analyzing data from cognitive tests.

# **Content**

The course consists of the following three modules:

## **Statistics, 3.0 hp**

Grading scale: VU

The module provides a repetition of previous statistics, but also deals with statistical correlations, analysis of variance, non-parametric tests, power calculation and statistical pitfalls. Practical knowledge is provided in computer labs.

## Cognition, 9.0 hp

Grading scale: VU

The module deals with human cognition and covers areas of cognitive psychology such as method, working memory, episodic memory, semantic memory, implicit memory functions, cognitive plasticity, language functions, intelligence, executive functions, problem solving and decision making. In addition, how sleep and gender interact with cognitive performance is touched upon. In most cases, all areas are highlighted from a cognitive theory perspective, where cognitive theories are presented, but also from a biological perspective, where the biological basis for the cognitive functions is presented. With the help of practical exercises, discussions and student presentations during seminars, in-depth and applied knowledge of cognitive functions is provided.

## Integration of cognition and statistics, 3.0 hp

Grading scale: GU

The module consists of laboratory work, in which aspects of cognition is examined in an experiment (multifactorial design), where research ethics, problem formulation, data collection, data analysis (analysis of variance) and interpretation of the data are performed in groups, and then documented and presented in a written scientific report. Finally, the laboratory reports are discussed at a critical review occasion.

## Teaching methods

### *Module 1, Statistics*

Teaching in statistics starts immediately after the course introduction and consists of web lectures, teacher-led teaching and practical computer exercises. There are also quizzes on reviewed material.

### *Module 2, Cognition*

Cognitive psychology is taught through web lectures and teacher-led lectures interspersed with seminars, workshops and practice sessions.

### *Module 3, Integration of cognition and statistics*

To integrate acquired knowledge in statistics and cognition, the students carry out their own investigation and analyze and report the results of this laboratory.

Some course elements in module 2 and 3 are compulsory, see the heading "Examination".

## Examination

*Module 1, Statistics*, is examined in the following way:

a) written exam, is graded U, G or VG

The module is graded as the exam; U, G or VG.

*Module 2, Cognition*, is examined in the following way:

a) written exam, is graded U, G or VG

b) compulsory quizzes

c) compulsory active participation at seminars and training opportunities, according to instructions in schedule

The module is graded U, G or VG. The grade G on the module requires G on the written exam as well as fulfillment of compulsory course elements. The grade VG on the module requires VG on the written exam as well as fulfillment of compulsory course elements.

*Module 3, Integration of cognition and statistics*, is examined in the following way:

a) writing of a laboratory report in which the student, together with course mates, reports the results of a completed investigation, is graded U or G

b) compulsory attendance at the introductory lecture, attendance and active participation in the group work and at supervision and opposition sessions, according to instructions in schedule.

The module is graded U or G. The grade G requires G on examination assignment a), as well as fulfillment of compulsory course elements.

#### *Course grade*

The entire course is graded U, G or VG.

The grade G on the entire course requires at least G on all three modules.

The grade VG on the entire course requires VG on module 2, and at least G on module 1 and 3.

#### *Absence from or unfulfillment of compulsory 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 exception from the course 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

The course has been cancelled and was offered for the last time in the spring semester of 2024. Examination will be provided until the spring of 2026 for students who have not completed the course.

## Other directives

Course evaluation takes place according to KI's local guidelines. Results and possible measures are returned to the students on course web.

Teaching in English may occur.

## Literature and other teaching aids

### Mandatory literature

The latest editions of the literature should be used.

*Borg, Elisabet; Westerlund, Joakim*

#### **Statistik för beteendevetare. : Faktabok**

3., [uppdaterade och omarb.] uppl. : Malmö : Liber, 2012 - 552 s.

ISBN:978-91-47-09737-1 (korr.) LIBRIS-ID:13434322

[Library search](#)

*Navarro, Danielle J.; Foxcroft, David R.*

#### **Learning statistics with jamovi: A tutorial for psychology students and other beginners**

University of New South Wales, 2019

URL: <https://www.learnstatswithjamovi.com/>

*Purves, Dale.*

**Principles of cognitive neuroscience**

2nd ed. : Sunderland, Mass. : Sinauer Associates, c2013.

ISBN:978-0-87893-573-4 LIBRIS-ID:13905270

[Library search](#)

*Reisberg, Daniel*

**Cognition : exploring the science of the mind**

7e, international student edition. : New York : W. W. Norton et Company, [2019] - xxiii, 585, A-27, G-20, R-49, C-5, I-26 pages

ISBN:9780393665093 LIBRIS-ID:w656z86gt8l766wh

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