PHYSICAL ACTIVITY AND HEALTHY BRAIN FUNCTIONS

FYSISK AKTIVITET OCH HÄLSOSAMMA HJÄRNFUNKTIONER

7.5 credits - 7.5 högskolepoäng

Course code: HBFYSA
Level: Bachelor's level
Main Field of Study: Sport Science
Progressive specialization: G1F
Disciplinary Domain: Sports
Subject group: Public Health
Established by: Utbildnings- och forskningsnämndens kursplaneutskott 2025-12-05
Version: 4
Valid from: Spring semester 2026

Entry requirements

Anatomy and Physiology, 7.5 credits.

Intended learning outcomes

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After completing the course, the student will be able to:

Knowledge and understanding
• Describe basic aspects of brain structure and function that are important for cognitive abilities and mental well-being,
• Explain the extent to which physical activity influences neurophysiological functions relevant to cognitive abilities and mental well-being such as neuroplasticity, blood flow, and neurotransmitters,
• Describe and evaluate methods used to measure cognitive abilities and mental well-being, such as cognitive tests, questionnaires, and brain imaging,

Skills and abilities
• Analyze data focused on the acute and long-term effects of physical activity on cognitive abilities and mental well-being,
• Formulate and justify a study aimed at investigating the relationship between physical activity and brain-related outcomes in a selected target group,

Judgment and approach
• Discuss applications of physical activity to promote cognitive abilities and mental well-being among groups of individuals with varying conditions and health status.

Course content

The course includes the following components:

• **Introduction to brain structure and function (iHSoF):** Basic knowledge about the brain's structure, function, and its connection to cognition and mental well-being.
• **Neuroplasticity and biological mechanisms (Mek):** In-depth understanding of how physical activity affects brain health through changes in blood flow, neurotransmitters, and neural

adaptations.
• **Methods for measuring brain health (Mät):** Overview of common methods such as questionnaires, cognitive tests, and brain imaging techniques (e.g., MRI) for assessing brain function.
• **Laboratory sessions (Lab):** Practical exercises on how physical activity influences cognition in both the short and long term, including test administration and group data collection.
• **Applications in different populations (Appl):** Examples of how physical activity can promote brain health in children, patients, and older adults.

Examination

The course examinations are as follows.

(2501) Skriftlig examination, 6 hp
(2501) Written examination, 6 credits

(2502) Laboration, 1.5 hp
(2502) Laboratory session, 1.5 credits

When students are examined, the obligations and rights are set accordingly with GIS's policies and regulations.
For each examination, one regular examination opportunity and one regular re-examination opportunity are arranged.
The regular re-exam (second opportunity) is offered no earlier than two weeks and no later than six weeks after the student has been notified of the results from the first examination.
In addition to the regular exam and re-exam, further re-exams (third or more) are provided for both theoretical and practical parts. At least three examination opportunities shall be offered within one year for each assessment.

A student who does not fully meet the requirements of an examination may, after a decision by the examiner, be given an opportunity to complete the exam to achieve a passing grade.
It is only possible to complete up to a passing grade, not a higher one. Normally, the complementary assignment is given when the grade from the original exam is announced.
The completion must be submitted within two weeks after the student has received the exam results, but before the next re-exam.

If the student fails to meet this deadline, the failed grade remains, and the student must retake the exam.

If the student has a decision from GIH (Swedish School of Sport and Health Sciences) regarding special pedagogical support due to a disability (NAIS certificate) or other reasons, the examiner may allow an adapted exam or an alternative examination method.

Students' rights and obligations in connection with examinations follow GIH's rules and regulations.

Course requirements

If a student misses a compulsory course element, the examiner may allow a replacement assignment.
This must be submitted no later than at the end of the sub-course or full course.
If the student has an approved decision from GIH for special pedagogical support (NAIS

certificate) or other reasons, the examiner may allow an adapted or alternative form of assessment.

Grades

Grades awarded in the course are:
Pass with distinction (VG), Pass (G), and Fail (U).

To receive a **Pass (G)** for the entire course, all examinations must be passed.
To receive **Pass with distinction (VG)** for the course, a Pass with distinction is required on the written exam.

At the latest by the start of the course, students must receive detailed information about the grading criteria for each level.

Student influence and course evaluation

In accordance with Chapter 1, Section 14 of the Higher Education Ordinance (1993:100), a written course evaluation is conducted after the course ends.
Feedback from the evaluation is shared with students afterward.
Course evaluations focus on students' learning and the pedagogical process, where learning outcomes, activities, and assessment results form the basis for pedagogical reflection and quality development.

Type of instruction

Teaching is conducted through lectures, group assignments, demonstrations, individual work, practical applications, and laboratory sessions.
The course will be taught in English.

Other information

If a course is discontinued or undergoes major changes, students are guaranteed at least three additional examination opportunities (in addition to the regular exam) within one year, but no longer than two years after the course has been discontinued or changed.

Literature and list of references

Lars Nyberg. *Kognitiv neurovetenskap – nya teorier och tillämpningar* [Cognitive Neuroscience – New Theories and Applications].
ISBN: 9789144138138. Year of publication: 2002; revised edition 2020. Article number: 7867-03

Scientific articles will be provided on Canvas at a later stage.