



DEPARTMENT OF CLINICAL NEUROSCIENCE

K8F5684, Sensory Perception in Clinical and Practice and Research, 1.5 credits (hec)

Sensorisk perception i klinisk praktik och forskning, 1,5 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus was approved by the The Committee for Doctoral Education on 2023-12-27, and was last revised on 2024-02-03. The revised course syllabus is valid from autumn semester 2024.

Responsible department

Department of Clinical Neuroscience, Faculty of Medicine

Prerequisite courses, or equivalent

No prerequisite courses, or equivalent, demanded for this course.

Purpose & Intended learning outcomes

Purpose

The course aims to introduce students to human sensory perception with a focus on clinical utility and research. The neurological and evolutionary principles underlying vision, hearing, smell, taste, touch, and additional methods of perception will be introduced.

Intended learning outcomes

Upon completion of the course, the doctoral candidate will be able

- 1) To show an understanding of the evolutionary and historical context for sensory neuroscience
- 2) To be able to differentiate between conscious perception and sub-conscious processing
- 3) To outline basic scientific methods for how to assess human sensory processing
- 4) To show an understanding for common sensory deviations in clinical medicine

Course content

The course will introduce the historical and evolutionary context for our senses, so as to provide

an understanding for why humans operate and behave the way we do. Beyond the traditional five senses of vision, hearing, taste, smell, and touch, we will discuss several other sensory modalities available to humans, including the vestibular system. The neurological principles guiding the integration of these senses will be outlined, with special reference to subconscious and conscious decision-making. These systems will then be tested through a series of practical experiments, giving students a chance to reflect on blind-spots in human perception and how to implement these in a scientific and clinical setting. Finally, common sensory pathologies will be discussed.

Forms of teaching and learning

Each sensory modality will be presented through a series of lectures, where key-points will be summarized through anonymous in-class quizzes. Associated with each set of lectures will be a practical experiment illustrating how sensory perception can be evaluated, carried out as group-assignments. Time will be given for self-studies in preparation for the examination.

Language of instruction

The course is given in English

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

Workshops and quizzes are obligatory, as is participation in the final examination.

Forms of assessment

The examination will be in the form of a short individual presentation on a medical condition influencing sensory perception. The presentation should include:

- 1) The mechanism of injury of the condition and its impact on the sensory system,
- 2) A description of how and what we evaluate when assessing the condition in a clinical or academic setting, and
- 3) A discussion on how the condition may affect the patient's symptoms and quality of life.

The presentation will be followed by a group discussion lead by a student opponent. Students must play an active role during both their presentation and opponency, showing that all intended learning outcomes have been achieved to pass the examination.

Course literature

Recommended literature:

Books:

- Kandel, E. R. Principles of neural science. 5th ed. edn, (McGraw-Hill, 2013).
(Information regarding specific neural processes will be retrieved from "Part V – Perception")

- Simon, R. P., Aminoff, M. J. & Greenberg, D. A. Clinical neurology. 10th edition edn, (McGraw-Hill Education, 2018).
(see chapters “Neuro-Ophthalmic Disorders”, “Disorders of Equilibrium”, and “Sensory Disorders”)
- Biller, J. Practical Neurology. (Wolters Kluwer, 2017).
(see the chapter “Approach to the Patient with Hearing Loss”)
- Welge-Luessen, A. & Hummel, T. Management of Smell and Taste Disorders : A Practical Guide for Clinicians. (Thieme Medical Publishers, Incorporated, 2013).
(see the chapters on functional anatomy for smell and taste, as well as chapters “Smell and Taste Disorders – Diagnostic and Clinical Work-Up”, “Taste Testing”, and “Taste Disorders”)

Reading material on sensory evolution:

- Land, M. F. & Fernald, R. D. The evolution of eyes. Annual review of neuroscience 15, 1-29 (1992).
- Hoover, K. C. Smell with inspiration: the evolutionary significance of olfaction. American Journal of Physical Anthropology 143, 63-74 (2010).
- Breslin, P. A. An evolutionary perspective on food and human taste. Current Biology 23, R409-R418 (2013).
- Clack, J. A. Evolutionary biology: The origin of terrestrial hearing. Nature 519, 168 (2015).
- Koch, C., Massimini, M., Boly, M. & Tononi, G. Neural correlates of consciousness: progress and problems. Nature Reviews Neuroscience 17, 307-321 (2016).
- Prescott, T. J. & Dürr, V. The world of touch. Scholarpedia 10, 32688 (2015).