Affective Neuroscience: Emotions, Cognition, and Behavior
Draft syllabus

Semester & Location: Fall 2018 - DIS Stockholm
Type & Credits: Core Course - 3 credits
Core Course Study Tours: Paris, France
Major Disciplines: Neuroscience, Psychology
Faculty Members: Élodie Cauvet
Program Director: Carla Caetano - cca@dis.dk

Time & Place: Monday/Thursday 8:30 – 9:50, Location: TBD

Description of Course
Prerequisite: One semester of neuroscience, physiological psychology, or biological psychology at university level
Co-requisite: Enrollment in Affective Neuroscience Research Lab

How do we understand the interplay of human emotions and their neural networks? This course applies findings from the interdisciplinary field of neuroscience and the psychological studies of cognition, emotion, and personality. Basic, complex, and social emotions are explored from the perspective of, for example, the subjective experience of emotion, non-conscious processes, how emotions are interpreted, expressed, or regulated. Affective systems, neural networks, and their relationship to cognitive processes such as attention, learning, memory, and decision making are addressed. Where relevant, human brain imaging findings, pathological conditions, treatment and cultural perspectives are considered.

Learning Objectives
By the end of this course, students should be able to:
- Discuss the main theoretical perspectives in affective neuroscience
- Contrast the physiological and neurological correlates underlying different emotions
- Critically analyze the impact of emotions on cognitive processes, including - but not limited to - higher order functions
- Compare and discuss the alterations of affect and its regulation in terms of cognitive and neural processes within the pathological and non-pathological framework
- Reflect upon the developmental milestones of emotions and their regulation in terms of behavior and neurological process
- Integrate the different levels of emotion processing (cognitive, psychological and neurological) and their interplay into multimodal models
- Discuss the key approaches to studying emotions and their regulation integrating neuroscience and cognitive psychology
- Critically evaluate research methods used in the affective neuroscience field
- Carry out a specific literature review with critical perspective on a selected topic
- Present, discuss and criticize scientific papers
- Critically reflect on the main issues, including ethics, validity etc. arising from the study of emotion
The following topics will be covered during the course:

**Theme 1: Basics of neurobiology of emotion**
- Neuroanatomy and brain organization
- Hormonal systems
- Autonomic nervous system

**Theme 2: Basics and introductory theory in cognitive psychology**
- Higher Order cognitive functions
- Cognitive and psychological theories of emotion
- Interplay of cognition emotion and behavior
- Psychological theories of emotion and the role of neuroscience

**Theme 3: Techniques used in affective neuroscience research**
- Neuroimaging
- Physiological measures
- Psychological measures

**Theme 4: Eliciting emotions**
- Emotion and the body
- Emotion and olfaction
- Emotion and music
- Emotion and language

**Theme 5: Emotions: from basics to complex**
- Excitement, pleasure, desire
- Anger, disgust and fear
- Happiness
- Social emotions: moral, social and empathy

**Theme 6: Emotion and cognition**
- Emotion and attention: bias and top down effects
- Emotion and memory
- Emotion regulation and the prefrontal cortex
- Emotion and reward
- Emotion and consciousness

**Theme 7: Variability in emotion**
- Sex differences
- Aging
- Cultural differences in emotion
- Affective disorders
Faculty

Élodie Cauvet obtained her PhD in Cognitive Neuroscience, from Pierre & Marie Curie University in Paris (France). Her research interest started with language acquisition in infants leading to the study of the cerebral processing of language and music in adults. She became interested in neurodevelopmental disorders starting with developmental dyslexia then expanding into autism spectrum disorders as well as ADHD. She is using techniques from psychology as well as neuroimaging in her research, this includes MRI (anatomical and functional) as well as EEG and eye tracking. She has been conducting her latest research at Karolinska Institutet Center for Neurodevelopmental Disorders (KIND). Her interests include social cognitive skills, empathy and emotion processing within the whole spectrum of functioning from typicality to disorders such as ASD. With DIS since 2016.

Reading (Examples):

Books: (selected chapters)


Articles (Selected):


Emotion regulation development


**Seasonal depression**


**Field Studies (examples)**

**In Stockholm**
Clinsics: Emotion regulation in children
Clinics - Habilitering: Treating anxiety with Mindfulness
Research: Emotion lab (KI or Stockholm University)
Research: Johan Lundsröm’s group at KI: emotion processing in relation to olfaction (aversive olfactory learning ...)

**Study Tours**

**Core Course Week and Short Study Tour**: Göteborg

**Theme**: Variability in emotion processing: from typicality to atypicality

**Long Study Tour- Paris:**

**Theme**: Eliciting emotions and how to measure them

Examples:

Palais de la Découverte or Cité des sciences et de l’industries
Methods: Arts et Métiers
Methods: Visit of ultra-high field magnet at Neurospin + potentially nuclear reactor for producing radiotracer, if possible.
School of medicine museum
Visit of one hospital/clinic
Guest Lecturers (examples)
E.g., Experts in the field will be invited to discuss Swedish/European perspectives pertaining to research and practice in the field

Lab: Refer to the co-requisite syllabus for all details

Evaluation
Grading

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<thead>
<tr>
<th>Assignment</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Attendance &amp; Participation</td>
<td>15%</td>
</tr>
<tr>
<td>Tests (2 tests at 15% each)</td>
<td>30% (Total)</td>
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<tr>
<td>Group Presentation (10%) with short paper (15%)</td>
<td>25% (Total)</td>
</tr>
<tr>
<td>Final Integration Paper</td>
<td>30%</td>
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Detailed assignment description /rubric will be available via Canvas/in-class/handouts/