Basic Neuroscience
for Organisational Research and Economics

Course instructors
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Course specifications: at least 2 SWS (21 hours class time), 3 ECTS.

Application procedure

Goal and target audience
PhD students interested in acquiring basic knowledge of neuroscience methods

Application process e-mail to
franziska.emmerling@tum.de

Course aims
What this course is
This seminar aims at teaching the basics of cognitive neuroscience and how it is applied more or less meaningfully in management and organisational research. We will specifically focus on non-invasive brain stimulation, electroencephalogram, and functional Magnetic Resonance Imaging. Graduate students will be enabled to understand these methods, successfully read respective papers and their method section, and to assess the potential as well as the pitfalls of neuroscientific methods in their fields of research.

Course objectives
At the end of the seminar graduate students will be able:

1. ... to evaluate if, when, and how it is meaningful to include neuroscientific methods into the methodology of organisational research.

2. ... to debate the pros and cons of neuroscience in behavioural science.
3. ... to understand what non-invasive brain stimulation is and does, as well as to easily read any brain stim paper (including the methods section).

4. ... to understand what electroencephalogram is and does, as well as to easily read any electroencephalogram paper (including the methods section).

5. ... to understand what functional Magnetic Resonance Imaging (fMRI) is and does, as well as to easily read any fMRI paper (including the methods section).

6. ... to familiarise themselves with concrete empirical examples of neuroscientific studies the field of organisational research and behavioural economics and the debates those studies triggered in their respective fields.

The seminar objectives will be achieved by: attending and participating actively in class; reading and discussing the assigned materials; and drafting an oral presentation including slides and hand-outs for one specific paper.

Preliminary schedule

Session I: 31.07., 9:30-12:00 & 13:00-15:00, Seminarraum Z577, TUM School of Management. Corner Luissenstraße and Arcisstraße, Arcisstraße 21, 80333 München

Session II: 07.08., 9:00-12:00 & 13:00-16:00, Seminarraum Z577, TUM School of Management. Corner Luissenstraße and Arcisstraße, Arcisstraße 21, 80333 München

Session III: 08.08., 9:00-12:00 & 13:00-16:00, Seminarraum Z577, TUM School of Management. Corner Luissenstraße and Arcisstraße, Arcisstraße 21, 80333 München

Session IV: 14.08., 9:00-12:00 & 13:00-16:00, Seminarraum Z577, TUM School of Management. Corner Luissenstraße and Arcisstraße, Arcisstraße 21, 80333 München

Core readings

Session I: The why and when in social neuroscience

Please read before the first session:

Session II: Focus eye-tracking

Methodological papers
Empirical papers


Session III: Focus Electroencephalogram

Methodological papers


Chapter 2 (all other Chapters are also very worth reading) of Dickter, C. L., & Kieffaber, P. D. (2013). EEG methods for the psychological sciences. Sage.


Empirical papers


Session IV: Focus functional Magnetic Resonance Imaging

Methodological papers


Empirical papers


Course procedures

The seminar will include four sessions (first session a 4.5 hours, three further sessions a 6 hours).

Session I: The why and when in social neuroscience
During this session, we will discuss when and why it can be useful to apply neuroscientific methodology to behavioural science. We will unravel the empirical potential of neuroscientific methodologies, while not neglecting their limitations. The session will include ppt-input from the course instructor, group discussion, and a panel debate. During our first session, we will, furthermore, decide together who will present which methodological and empirical literature for the focus-sessions and other organisational questions.

Session II: Focus eye-tracking
During this session, we will focus on eye-tracking. First, we will discuss the method, how it works, the various ways of using it, (dis)advantages, and its risks. We will figure out, how to fruitfully read a paper, which employs eye-tracking, without being experts on eye-tracking. The afternoon will be dedicated to an in-depth approach of how to use eye-tracking with hands on.

Session III: Focus functional Electroencephalogram
During this session, we will focus on Electroencephalogram (EEG). First, we will discuss the method, how it works, the various ways of analysing EEG data, (dis)advantages, and its risks. We will figure out, how to fruitfully read a paper, which employs EEG, without being experts on EEG. The afternoon will be dedicated to an in-depth approach of how to use EEG with hands on.

Session IV: Focus functional Magnetic Resonance Imaging
During this session, we will focus on functional Magnetic Resonance Imaging (fMRT). First, we will discuss the method, how it works, the various ways of analysing fMRI data, (dis)advantages, and its risks. We will figure out, how to fruitfully read a paper, which employs fMRI, without being experts on fMRI. The afternoon will be dedicated to an in-depth approach of how to use fMRI data with hands on.

Assessment

The main delivery is a presentation of ca. 30 minutes on either a methodological or an empirical paper. Graduate students will work on those presentations either on their own or in pairs and they are expected to prepare a) a set of informative and well-designed slides on their topic (no text, but visuals to support their oral presentations) and b) a hand-out for their fellow students which includes all essential information on their topic. Assuming that the postgraduate students participate regularly and actively in class and prepare well for their presentations, they will receive a certificate, passing the seminar.