

<b>Course title: Clinical Neurosciences I</b>				
<b>Identification number</b>	<b>Workload</b>	<b>Credits</b>	<b>Frequency of occurrence</b>	<b>Duration</b>
M-Neuro-AM11 a-d	180h	6	SS	one semester
1	<b>Type of lessons</b> a) Lectures b) Practical c) Seminar	<b>Contact times</b> a) 30 h b) 45 h c) 15 h	<b>Self-study times</b> 90 h (Preparation and post-processing of lectures, practical and exam)	<b>Intended group size</b> a) ca. 20 b) ca. 20 c) ca. 20
2	<p><b>Aims of the module and acquired skills</b></p> <p><b>Main educational objective</b> is to provide expertise in the current scientific approaches in clinical neurosciences with a focus on psychiatric disorders. Moreover, the aim is that students are able to transfer the methodological and conceptual expertise to apply these in own independent research projects.</p> <p><b>After finishing the module</b>, students will have acquired knowledge about i) the operationalised classification systems in psychiatry, ii) the neurobiological foundations of major psychiatric disturbances. Moreover, students will acquire theoretical and practical expertise in state-of-the-art methodological approaches such as machine-learning, clustering and network modelling.</p> <p><b>Methods /Models</b> Psychopathology, operationalised classification criteria, structural and functional neuroimaging, genetics, deep brain stimulation, machine-learning, clustering, network modelling.</p>			
3	<p><b>Contents of the module</b></p> <ul style="list-style-type: none"> <li>• Neurobiological Models of psychiatric disturbances (e. g. schizophrenia, dementia, affective diseases, autism spectrum disorder)</li> <li>• Neuroscientific methods including structural and functional neuroimaging, genetics and cognitive neuroscience methods</li> <li>• Methodological approaches in clinical neurosciences including machine learning for prediction, clustering and network modeling</li> <li>• At the end of the semester, the studied concepts and acquired theoretical knowledge in machine-learning methods, will be practiced during a blocked tutorial (most likely online via Zoom). Using the R statistical learning software, we will practice implementing machine learning analysis pipelines for e.g. personalized prediction or clustering.</li> </ul>			
4	<p><b>Teaching/Learning Methods</b> Seminar, presentation, practical tutorial sessions, guidance to independent research</p>			
5	<p><b>Requirements for participation</b> Enrollment in the Master's degree course "Experimental and Clinical Neurosciences" at the University of Cologne <b>Additional:</b> Basic knowledge in neuroanatomy, neurophysiology and biology</p>			
6	<p><b>Type of module examination</b> Regular participation, preparation of a scientific talk during the seminar, active participation in practical tutorial <b>Examination:</b> presentation</p>			
7	<p><b>Requirement for the allocation of credits</b> Regular participation, successful presentation in seminar, successful participation in methods tutorial</p>			
8	<p><b>Compatibility with other Curricula</b> none</p>			

9	<p><b>Significance of the module mark for the overall grade</b></p> <p>In the Master's degree course "Experimental and Clinical Neurosciences": 6 % of the overall grade (see also appendix of the examination regulations)</p>
10	<p><b>Module coordinator</b></p> <p>Prof. Dr. Joseph Kambeitz, 0221 478 4024, joseph.kambeitz@uk-koeln.de</p>
11	<p><b>Additional information</b></p> <p><b>Literature:</b></p> <ul style="list-style-type: none"> <li>• Relevant Peer-Review Literature (Selected by Faculty)</li> <li>• Bear MF, Connos BW, Paradiso MA: Neurowissenschaften. Spektrum Verlag, 3. Aufl. 2016;</li> <li>• Gareth J, Witten D, Hastie T, Tibshirani R: An Introduction to Statistical Learning with Tutorials in R. Springer. <a href="https://www.statlearning.com/">https://www.statlearning.com/</a></li> </ul>