

Educational course: Neuroimaging – 19.11.2025 – 21.11.2025,

Location: CEITEC MU, Brno, Czech Republic,

Masaryk University Campus, Building E35, Seminar room 145

Detailed program

Wednesday 19th November

Time	Description
8:30-9:15	Registration of participants
9:15 – 9:25	Introduction to the course (<i>Michal Mikl</i>)
9:25 – 10:15	Anatomical and physiological backgrounds to brain mapping (<i>Pavel Hok</i>)
10:15 – 10:30	Coffee break
10:30 – 12:00	Overview of MRI principles for non-physicists (<i>Zenon Starčuk</i>)
12:00 – 13:00	Lunch
13:00 – 14:45	fMRI basics • Principles of fMRI (<i>Michal Mikl</i>) • fMRI data preprocessing (<i>Anežka Kovářová</i>) • Statistical analysis of fMRI data (<i>Martin Gajdoš</i>) • Overview of fMRI connectivity (<i>Martin Gajdoš</i>)
14:45 - 15:00	Coffee break
15:00 – 17:00	Advanced fMRI and related topics • How to prepare acquisition of fMRI data (<i>Michal Mikl</i>) • fMRI neurofeedback (<i>Pavla Horká Linhartová</i>) • Dynamical signatures of resting state activity (<i>Jan Fousek</i>) • Basics of human brain perfusion imaging with ASL (<i>Martin Gajdoš</i>) • Data quality issues in MRI/fMRI (<i>Michal Mikl</i>)

Thursday 20th November

Time	Description
9:00 – 10:30	Electrophysiological methods in brain mapping • EEG data preprocessing (<i>Martin Lamoš</i>) • Analysis of EEG microstates (<i>Tomáš Jordánek</i>) • High-density EEG data analysis (<i>Martin Lamoš</i>)
10:30 – 10:45	Coffee break
10:45 – 11:30	Electrophysiology and fMRI • Simultaneous EEG-fMRI (<i>Radek Mareček</i>) • SignalPlant - software for EEG data handling and deep learning (<i>Filip Plešinger</i>)
11:30 – 12:15	Diffusion MRI • Principles of DWI and fiber tracking (<i>Jan Valošek</i>)
12:15 – 13:15	Lunch
13:15 – 15:00	Practical session in MRI labs • Placed at MAFIL labs (2nd underground floor) • Two parallel groups: A) simultaneous EEG-fMRI recording, B) advanced fMRI approaches and fMRI accessories
15:00 – 15:15	Coffee break
15:15 – 16:30	Morphometry • Principles and methods of brain morphometry (<i>Pavel Říha</i>) • Group analysis in morphometry and other advanced topics (<i>Radek Mareček</i>)

Friday 21th November

Time	Description
9:00 – 10:30	Noninvasive brain stimulation techniques • Transcranial magnetic stimulation- basic principles and applications (<i>Luboš Brabenec</i>) • Transcranial electric stimulation- basic principles and novel methods of NIBS (<i>Monika Pupíková</i>) • Combination of NIBS with other neuroimaging techniques (<i>Lubomíra Nováková</i>)
10:30 – 10:45	Coffee break
10:45 – 11:30	Differences between animal and human studies. technical aspects of animal studies. Quantitative imaging, physiological models, and Perfusion (<i>Ondřej Macíček</i>)
11:30 – 12:15	Neuroimaging studies and data – practical aspects • Data workflow and data formats in neuroimaging. FAIR data, preparation of publicly available datasets (<i>Tomáš Slaviček</i>) • How to prepare and conduct neuroimaging study – practical hints (<i>Michal Mikl</i>)
12:15 – 13:15	Lunch
13:15 – 15:30	fMRI data processing with SPM - practical session Processing of fMRI data in SPM12 with example dataset (<i>Kateřina Ingrová / Tereza Švestková</i>)