NEUROSCIENZE
DOTTORATO DI RICERCA

Titoli e syllabi dei corsi avanzati di ricerca previsti per il Dottorato in Neuroscienze

(corsi aggiuntivi rispetto ai corsi trasversali della Scuola di Dottorato)

Titles and syllabi of the advanced training courses of the PhD program in Neuroscience

(to be added to the training courses of the Doctoral School)

I diversi corsi sono organizzati in moduli indipendenti, in modo che ciascuno studente possa costruirsi in autonomia un percorso formativo personalizzato in base ai propri interessi ed alle proprie conoscenze.

The courses are organized as indipendent modules. PhD students can arrange their own schedule according to their personal interests and background.

SOMMARIO DEI CORSI

1. BASI DELLA RICERCA IN NEUROSCIENZE – *BASIS OF RESEARCH IN NEUROSCIENCE*

Il corso si prefigge di fornire agli studenti una solida base comune di conoscenze riguardanti aspetti fondamentali delle neuroscienze in ambiti diversi. I moduli sono rivolti sia a studenti interessati alle neuroscienze di base sia a quanti sono più indirizzati alle neuroscienze cliniche.

Aim of the course is to provide students with a common background of knowledge in the different aspects of Neurosciences. It is dedicated both to students involved in experimental and the clinical neurosciences.

1.1. Elementi di biologia molecolare applicati ai modelli cellulari - *Advances in molecular biology*

Teacher	*Alessandra Bulbarelli* Università degli studi di Milano Bicocca
Title	**Advances in molecular biology**
Typology of proposal	cycle of lectures
CFU/ECTS	1
Hours	8 hours (4 lessons, 2 hours each lesson)
Objectives	Presentation of the more recent advances in molecular biology. Lectures will be suitable for all PhD neuroscience students (I ,II or III years).
Short description of contents	The course will cover topics related recent molecular biology techniques: Molecular genetic in CNS tumors; Quantitative PCR: Next Generation Sequencing and High Resolution Melt; From recombinant DNA techniques to conditional modelling, from RMCE to genome editing techniques in in vivo experimental models - Examples in Neurosciences
Method	presentation
Evaluation	Written test
Participants (min/max)	Min: 4 ; max: no limitation
Calendar	To be determined according to the overall teaching plan
Notes	

1.2. Cell-to-cell communication nel sistema nervoso - *Cell to cell communication in the brain*

Teacher	*Silvia Coco* Università degli studi di Milano Bicocca
Title	**Cell to cell communication in the brain**
Typology of proposal	Cycles of lectures
CFU/ECTS	1
Hours	8

Objectives	The lectures given by experts in the topic will highlight the key features of cell to cell communication in the brain. Lectures will be suitable for all PhD neuroscience students (I, II or III years).
Short description of contents	Cell communication in brain: release of NT, extracellular vesicles, gap junctions, tunneling nanotubes. Brain cell intercommunication: building up the GABAergic inhibitory transmission Extracellular vesicles: biogenesis, functions, isolation and their application in mouse model of Alzheimer's disease. Unconventional autophagy: exophagy in neurodegenerative diseases.
Method	presentation
Evaluation	Written test
Participants (min/max)	At least 4, no maximum
Calendar	To be determined according to the overall teaching plan
Notes	Lecturers will be: Silvia Coco, University of Milano Bicocca Genni Desiato, University of Milano Bicocca Chiara Elia, Humanitas Research Institute Elena Lonati, University of Milano Bicocca Morris Losurdo, University of Milano Bicocca

1.3. Fisiologia e patologia delle cellule gliali - *Glial cells in health and disease*

Teacher	*Anna Maria Colangelo* Università degli Studi di Milano Bicocca
Title	**Glial cells in health and disease**
Typology of proposal	lectures
CFU/ECTS	1
Hours	8
Objectives	To give a comprehensive overview of the role and function of glial cells
Short description of contents	Glial cells in brain function Brain metabolism and neuro-metabolic coupling Alteration of glial function in neurodegenerative disorders
Method	presentation
Evaluation	Written test
Participants (min/max)	Min 3
Calendar	To be determined according to the overall teaching plan
Notes	OK for students of I-II-III year

1.4. Biologia e terapia delle malattie neurodegenerative - *Pathways, biomarkers and new therapies in neurodegenerative disorders*

Teacher	*Carlo Ferrarese* Università degli Studi di Milano Bicocca
Title	**Pathways, biomarkers and new therapies in neurodegenerative disorders**
Typology of proposal	Cycle of lectures
CFU/ECTS	1
Hours	8
Objectives	To present current translational research on pathways and biomarkers for early diagnosis and new targeted therapies
Short description of contents	molecular mechanisms of neuronal damage (protein misfolding, excitotoxicity, oxidative stress, neuroinflammation) biomarkers in patients new therapeutic trials based on biomarkers
Method	Interactive lectures, with presentation of experimental data and current literature
Evaluation	Current literature presentation
Participants (min/max)	1/10
Calendar	May 8-15-22-29, 2017 From 11:00 to 13:00
Notes	Place: Biblioteca Clinica Neurologica, Ospedale San Gerardo, Settore C, VI piano

1.5. Il ruolo della neuroinfiammazione nella patogenesi delle malattie neurologiche - *Neuroinflammation in health and disease*

Teacher	*Maria Foti* Università degli Studi di Milano-Bicocca
Title	**Neuroinflammation in health and disease**
Typology of proposal	Cycle of lectures
CFU/ECTS	1
Hours	8
Objectives	The students will be able to: Explain how the immune system and cellular brain components contribute to neurological disease Describe the types and effector functions of resident and peripheral immune cells in the human brain, in health and disease
Short description of contents	In this course, the diverse and complex interactions between the brain and the immune system from the perspective of current, cutting-edge research papers will be explored. The course will provide an extensive knowledge of the role of inflammation in nervous system health and disease. Inflammation is

	involved in many central nervous system (CNS)-regulated physiological processes (including energy balance, sleep, memory and synaptic plasticity), and is a key host defence response to acute and chronic peripheral and central disorders. Research into neuroinflammation is a major field that aims to develop new therapeutic interventions to treat all major nervous system disorders including stroke, brain trauma, epilepsy, Alzheimer's disease and neuropathies. This unit will cover the important role of inflammatory molecules as key mediators of CNS functions and will provide basic knowledge on the pathogenesis of, and inflammatory responses to acute and chronic nervous system disorders.
Method	Presentation
Evaluation	Each student will prepare a presentation based on a recent topic research papers. Critical reading and presentation skills will be evaluated.
Participants (min/max)	11
Calendar	To be determined according to the overall teaching plan
Notes	

1.6. Pathways molecolari e neurotossicità – *Molecular pathways and neurotoxicity*

Teacher	*Mariarosaria Miloso* Università degli Studi di Milano Bicocca
Title	**Molecular pathways and neurotoxicity**
Typology of proposal	Lecture
CFU/ECTS	1
Hours	8
Objectives	The goal of the teaching activity is to introduce Phd students to knowledge and study of molecular pathways involved in neurotoxicity mechanisms of different neurotoxic substances.
Short description of contents	Study of molecular pathways involved in neurotoxicity of: 1. naturally occurring elements; 2. biological compounds; 3. synthetic compounds; 4. therapeutic drugs; 5. abused substances
Method	Lecture with example
Evaluation	Written examination
Participants (min/max)	Minimum 4
Calendar	To be determined according to the overall teaching plan
Notes	Suggested year of attendance: I, II, III

1.7. Effetti dell'inquinamento ambientale sul sistema nervoso - *Effects of air pollution on neurodegenerative diseases*

Teacher	*Paola Palestini* Università degli Studi di Milano Bicocca
Title	**Effects of air pollution on neurodegenerative diseases**
Typology of proposal	Cycle of lectures
CFU/ECTS	1
Hours	8
Objectives	To present an overview of the more recent findings on the effects of air pollution on the nervous system
Short description of contents	In this cycle of seminars will be presented: • Definition of air pollution and Particular Matter (PM), chemical composition, methods of detection and quantification, European laws. • Effects on human health (pulmonary and cardiovascular) • CNS effects and possible implication in neurodegenerative diseases onset
Method	Presentation and Interactive lecture
Evaluation	yes
Participants (min/max)	10
Calendar	To be determined according to the overall teaching plan
Notes	Suggested for I and II year

1.8. La staminalità nelle neuroscienze - *The concept of staminality in neuroscience*

Teacher	*Arianna Scuteri* Università degli Studi di Milano Bicocca
Title	**The concept of staminality in neuroscience**
Typology of proposal	Cycle of lectures
CFU/ECTS	1
Hours	8
Objectives	- To clarify the "stemness" concept for the Nervous System. - To explore the stem cell potential for research and therapy.
Short description of contents	• The stem cell features • The stem cells in the Nervous system: neurogenesis • Methods to potentiate endogenous neurogenesis • From stem cells to neurons: therapeutic approaches.
Method	Interactive lecture
Evaluation	Questionnaire
Participants (min/max)	4-10
Calendar	To be determined according to the overall teaching plan
Notes	Suggested Year of attendance: I, II and III.

1.9. Neurogenetica - *Neurogenetics*

Teacher	*Lucio Tremolizzo* Università degli Studi di Milano-Bicocca
Title	**Neurogenetics**
Typology of proposal	Cycle of lectures
CFU/ECTS	1
Hours	8
Objectives	Learning principles of neurogenetics, i.e. genetic applied to neurological and psychiatric disorders
Short description of contents	Principles of genetics applied to the field of neuroscience Behavioral and cognitive phenotypes Motor phenotypes I (strength) Motor phenotypes II (quantity/quality of movement)
Method	Presentation
Evaluation	Multiple choice test
Participants (min/max)	5/15
Calendar	To be determined according to the overall teaching plan
Notes:	Year of attendance: any

2. TECNICHE APPLICATE ALLE NEUROSCIENZE – *METHODS IN NEUROSCIENCE*

Verranno affrontate diverse tecniche e metodologie di ricerca che trovano applicazione sia nell'ambito delle neuroscienze di base sia in quelle cliniche. I moduli di questo corso saranno tenuti da docenti con esperienza specifica nei vari argomenti e quindi potranno sia introdurre i neofiti all'utilizzo di tali tecniche sia rappresentare un momento di crescita e confronto per i dottorandi che già le utilizzano.

Aim of this course is to introduce to basic techniques used both in experimental and clinical neurosciences. Each topic will be addressed by experienced teachers, who will introduce the beginners to the use of such methods as well as help the more skilled ones to improve their abilities.

2.1. Test comportamentali preclinici – *Behavioral test in preclinical neuroscience*

Teacher: name and affiliation	*Gianfranco Caselli* Rottapharm Biotech
Title	**Behavioral test in preclinical neuroscience**
Typology of proposal	Workshop
CFU/ECTS	1
Hours	12
Objectives	The aim of this teaching activity is to introduce those students without this background to the basics of behavioral testing in vivo using animal models
Short description of contents	Understanding the basis of behavioral testing in animals Observing the application of behavioral testing in healthy animals Observing the application of behavioral testing in animal modles of neuropathic pain
Method	Lecture with exercise/practice
Evaluation	No
Participants (min/max)	2-5
Calendar	To be determined according to the overall teaching plan
Notes	

2.2. Principi e metodi per meta-analisi nelle neuroscienze cliniche - *Meta-analyses in neurosciences: an introduction*

Teacher	*Giuseppe Carrà* Università degli Studi di Milano-Bicocca
Title	**Meta-analyses in neurosciences: an introduction**
Typology of proposal	Workshop
CFU/ECTS	1
Hours	8
Objectives	Acknowledge basic principles and procedures of commonly-used methods for meta-analysis following both PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) and MOOSE (Meta-analysis of Observational Studies in Epidemiology) guidelines

Short description of contents	Introduction to epidemiology in neurosciences Different measures of association for results synthesis in meta-analysis The publication bias issue Risk of bias and quality assessment
Method	Presentation Interactive lectures Lectures with exercise/practice
Evaluation	Final practical session to assess students' learning
Participants (min/max)	Min 3 max 10
Calendar	To be determined according to the overall teaching plan
Notes	

2.3. Istopatologia generale e neuropatologia - *General histopathology and neuropathology*

Teacher	*Guido Cavaletti* Università degli Studi di Milano Bicocca
Title	**General histopathology and neuropathology**
Typology of proposal	Workshop
CFU/ECTS	1
Hours	12
Objectives	The aim of this teaching activity is to introduce those students without this background to the basics of histology and to allow them to practice on selected specimens the simples methods to prepare slides for microscopic observation
Short description of contents	Understanding the basis of fixation, embedding and cutting for light and electron microscopy Cutting of samples for light microscopy Staining and observation of the specimens
Method	Lecture with exercise/practice
Evaluation	No
Participants (min/max)	3
Calendar	To be determined according to the overall teaching plan
Notes	

2.4. Diagnostica molecolare per immagini in neuroscienze - *PET-based molecular imaging in neuroscience*

Teacher	*Rosa Maria Moresco* Università degli Studi di Milano-Bicocca
Title	**PET-based molecular imaging in neuroscience**
Typology of proposal	Introductory seminars

CFU/ECTS	1
Hours	8
Objectives	To learn fundamentals of research and diagnostic application of PET based in vivo molecular imaging of the brain. To understand results of a study based on the use of PET
Short description of contents	a) design and preclinical and clinical development of novel potential diagnostic agents; b) general use in clinical practice or animal model development c) use of PET based molecular imaging for drug development
Method	Interactive lectures, exercises
Evaluation	Written. Question on the potential use of PET imaging in different experimental paradigms
Participants (min/max)	5
Calendar	To be determined according to the overall teaching plan
Notes	

2.5. Tecniche di stimolazione cerebrale non invasive nelle neuroscienze cognitive - *Non-invasive brain stimulation techniques in cognitive neuroscience*

Teacher	*Leonor Josefina Romero Lauro* Università degli Studi di Milano-Bicocca
Title	**Non-invasive brain stimulation techniques in cognitive neuroscience**
Typology of proposal	Small course
CFU/ECTS	2
Hours	16
Objectives	-presenting the theoretical framework and the mechanisms of action of three non-invasive brain stimulation techniques: Transcranial Magnetic Stimulation (TMS), Transcranial Direct Current Stimulation (TDCS), an integrated system combining TMS and Electroencephalography (TMS-EEG) -Discussing examples of the use of these techniques for research in the field of cognitive neuroscience -Providing the basic practical knowledge for the use of the techniques
Short description of contents	The mechanism of action of three non-invasive brain stimulation techniques: TMS, tDCS and TMS-EEG The use of TMS, tDCS and TMS-EEG for research purposes in the field of cognitive neuroscience Practical class on tDCS: setting and choosing the stimulation parameters, electrodes montage, electrode positioning according to the 10-20 EEG system. Practical class on TMS: setting and choosing the stimulation parameters, determining the resting motor threshold, using the neuronavigation system to guide coil positioning,

	Practical class on TMS-EEG: setting and choosing the stimulation parameters, using the neuronavigation system, collecting one session of TMS-Evoked potentials (TEPs), hints on TEPs data analysis
Method	The theoretical framework, the mechanisms of action and the use of the TMS, tDCS, TMS-EEG in cognitive neuroscience will be held in interactive lecture. The practical classes will be held in small groups in the TMS and TMS-EEG labs in the Department of Psychology, Ed. U6.
Evaluation	A multiple choice test
Participants (min/max)	5-10
Calendar	To be determined according to the overall teaching plan
Notes	

2.6. Elettrofisiologia dei sistemi corticali: epilettogenesi ed epilessia - *Basic Mechanism of Epilepsy*

Teacher	*Giulio Sancini* Università degli Studi di Milano-Bicocca
Title	**Basic Mechanism of Epilepsy**
Typology of proposal	Cycle of lectures
CFU/ECTS	1
Hours	8
Objectives	The goal is to equip students with the knowledge they need to understand the fundamental concepts underlying current research in the neurophysiology of central circuits. Lectures will allow students to learn how to identify interesting biological questions and feasible approaches to address the questions.
Short description of contents	experimental work introduces the student to the main electrophysiological research techniques structure and function of ion channels, generation and propagation of action potential, firing properties and physiology of synaptic transmission the hypersynchronous discharge: persistent neuronal changes and circuitry rearrangement
Method	Interactive lectures, includes problem sets and reading of original papers
Evaluation	Final evaluation by written test (multiple choice)
Participants (min/max)	4/20
Calendar	To be determined according to the overall teaching plan
Notes	Suggested for students attending the 1 year of the PhD program

3. MODELLI SPERIMENTALI IN NEUROSCIENZE – *EXPERIMENTAL MODELS IN NEUROSCIENCE*

Obiettivo di questo corso è presentare ai dottorandi una panoramica dei modelli sperimentali applicabili nell'ambito delle neuroscienze, fornendo anche informazioni di tipo normativo. Questo corso è rivolto sia a quanti già si occupano di ricerca preclinica sia a quanti si avvicinano a questo tema per la prima volta.

Aim of this course is to present an overview of the experimental models used in the field of the neurosciences, with a particular attention to the current regulations and rules. It is open both to students who already work in preclinical research and to the beginners in this field.

3.1. Sperimentazione animale: criticità, aspetti etici e normativi - *Animal testing: critical items, ethical issues and regulation*

Teacher	*Federica Avezza* Università degli Studi di Milano-Bicocca
Title	**Animal testing: critical items, ethical issues and regulation**
Typology of proposal	Lecture
CFU/ECTS	1
Hours	8
Objectives	Notes of animal testing, with highlights on ethical issues and rules, for animal facility users and non-users.
Short description of contents	Laboratory animal science Regulations in force on animal testing Ethical issues on animal testing
Method	Interactive lecture. Possible external experts participation.
Evaluation	Written exam
Participants (min/max)	6-20
Calendar	To be determined according to the overall teaching plan
Notes	Suggested for students attending the I and II year of the PhD program

3.2. I modelli animali di malattia in neuroscienze - *Animal models of human disease in neuroscience*

Teacher	*Paola Marmiroli* School of Medicine and Surgery – Università of Milano-Bicocca
Title	**Animal models of human disease in neuroscience**
Typology of proposal	Lecture
CFU/ECTS	1
Hours	8
Objectives	The aim of the teaching is to explain how the use of animal models could improve our knowledge of human diseases, evaluate the problems

	connected with the management of animal models and with the extrapolation of data from animals to humans.
Short description of contents	Main points of the lectures: The reason for using animal models and problems associated with animal experimentation. Evaluation of the different kinds of animal models and examples of established models, with particular regard to the most commonly used animals in biomedical research: the laboratory mouse and rat. Description and analysis of animal models of some specific human diseases.
Method	Interactive lecture
Evaluation	Multiple choice test
Participants (min/max)	Minimum: 4
Calendar	To be determined according to the overall teaching plan
Notes	Suggested for students attending the I and II year of the PhD program

3.3. La "GLP" nella sperimentazione preclinica - *Good Laboratory Practice (GLP) and preclinical studies*

Teacher	*Gabriella Nicolini* Università degli Studi di Milano Bicocca
Title	**Good Laboratory Practice and preclinical studies**
Typology of proposal	Lecture
CFU/ECTS	1
Hours	8
Objectives	The goal of the teaching is to explain to Phd students the principles of Good Laboratory Practice (GLP) defining a set of rules and criteria for a quality system concerned with the organisational process and the conditions under which non-clinical health and environmental safety studies are planned, performed, monitored, recorded, reported and archived.
Short description of contents	GLP main points: 1.Resources: Organisation, personnel, facilities and equipment; 2. Characterisation: Test items and test systems; 3. Rules: Protocols, standard operating procedures (SOPs); 4. Results: Raw data, final report and archives; 5. Quality Assurance: Independent monitoring of research processes
Method	Lecture with example
Evaluation	Multiple choice test
Participants (min/max)	Minimum 4
Calendar	To be determined according to the overall teaching plan
Notes	

4. NEUROSCIENZE CLINICHE – *CLINICAL NEUROSCIENCE*

I moduli di questo corso sono rivolti principalmente (ma non esclusivamente) ai dottorandi del track di Neuroscienze cliniche e presentano un approccio sul campo a quello che è la ricerca che si svolge nel reparto di Neurologia dell'Ospedale San Gerardo a Monza.

This course is devoted mainly but not only to students interested in clinical neurosciences. The different modules will focus on the clinical research that is carried out at the Neurology department of the San Gerardo Hospital in Monza.

4.1. Neuropsicologia clinica e sperimentale – *Clinical and experimental neuropshychology*

Teacher	*Ildebrando Appollonio* Università degli Studi di Milano-Bicocca
Title	**Clinical and experimental neuropsychology**
Typology of proposal	Neuropsychological Lab frequency
CFU/ECTS	1
Hours	8
Objectives	Surveillance on neuropsychological approach and research
Short description of contents	Standard psychometric evaluations Draft of NPS reports Experimental NPS approach
Method	Attendance of a NPS Lab and Service
Evaluation	At least 80% of programmed hour frequency
Participants (min/max)	1/4
Calendar	To be determined according to the overall teaching plan
Notes:	Place: Servizio e Laboratorio di Neuropsicologia, Clinica Neurologica, Ospedale San Gerardo, Settore C, piano 6.

4.2. Neuropsicologia e malattie neurodegenerative – Neuropsychology and neurodegenerative disorders

Teacher	*Ildebrando Appollonio* Università degli studi di Milano Bicocca
Title	**Neuropsychology and neurodegenerative disorders**
Typology of proposal	Cycle of lectures
CFU/ECTS	2
Hours	16
Objectives	Presentation of current research on selected neuropsychological topics.
Short description of contents	Foundations of Neuropsychology Cognitive aging Neuropsychological tests and evaluation

	Memory, amnesic syndromes and Alzheimer's disease Executive functions, Fronto-temporal degenerations and amyotrophic lateral sclerosis Focal and degenerative Aphasia, Agnosia and Semantic dementia
Method	Interactive lectures with case reports and updated literature review
Evaluation	No final evaluation (16 hours of course)
Participants (min/max)	4/8
Calendar	The 4 Mondays of March 2017 (6,13,20,27), 2:30-6:30 pm
Notes	Place: Biblioteca Clinica Neurologica, Ospedale San Gerardo, Settore C, piano 6.

4.3. Neuroimmunologia clinica – *Clinical neuroimmunology*

Teacher	*Guido Cavaletti* Università degli Studi di Milano Bicocca
Title	**Clinical neuroimmunology**
Typology of proposal	Workshop
CFU/ECTS	1
Hours	8
Objectives	The aim of this teaching activity is to introduce those students without a clinical background in neurology to the neurological examination and to the recognition of signs and symptoms of neuroimmunological diseases, with a focus on Multiple Sclerosis
Short description of contents	Understanding the basis of the neurological examination of the central nervous system Assisting to an outpatient clinic activity as observers Reporting in summary the results of a clinical assessment of real patients
Method	Lecture with exercise/practice
Evaluation	Yes (evaluation of the summary report)
Participants (min/max)	3
Calendar	To be determined according to the overall teaching plan
Notes:	

4.4. Neuropatie periferiche – *Peripheral neuropathies*

Teacher	*Guido Cavaletti* Università degli Studi di Milano Bicocca
Title:	**Peripheral neuropathies**
Typology of proposal	Workshop
CFU/ECTS	1
Hours	8

Objectives	The aim of this teaching activity is to introduce those students without a clinical background in neurology to the neurological examination and to the recognition of signs and symptoms of peripheral nerve damage
Short description of contents	Understanding the basis of the neurological examination of the peripheral nervous system Assisting to an outpatient clinic activity as observers Reporting in summary the results of a clinical assessment of real patients
Method	Lecture with exercise/practice
Evaluation	Yes (evaluation of the summary report)
Participants (min/max)	3
Calendar	To be determined according to the overall teaching plan
Notes	

4.5. Neuropsichiatria e neurologia comportamentale - *Behavioural neurology and neuropsychiatry*

Teacher	*Andrea Cavanna* Aston University, Birmingham (UK)
Title	**Behavioural neurology and neuropsychiatry**
Typology of proposal	Cycle of lectures
CFU/ECTS	1
Hours	8
Objectives	Presentation of the main principles of behavioural neurology
Short description of contents	Introduction to behavioural neurology and neuropsychiatry Behavioural neurology of movement disorders Behavioural neurology of epilepsies
Method	Interactive lectures
Evaluation	Written test
Participants (min/max)	2-10
Calendar	To be determined according to the overall teaching plan
Notes	suggested year of attendance: III

4.6. La fMRI nelle neuroscienze cognitive e cliniche: dalla teoria aal pratica - *The fMRI technique in cognitive and clinical neuroscience: from theory to practice*

Teacher	*Eraldo Paulesu* Università degli Studi di Milano Bicocca
Title	**The fMRI technique in cognitive and clinical neuroscience: from theory to practice**
Typology of proposal	Cycle of lectures split in theoretical presentations + lab exercises on portable computers
CFU/ECTS	2
Hours	16

Objectives	The student will learn the methodological principles and the fundamental analytical techniques of fMRI in activation paradigms and in resting state studies
Short description of contents	• The biological and biophysical foundations of fMRI • Main applications in cognitive neuroscience • Principles of experimental design in fMRI • Principles of data-analysis of fMRI data with practical exercises on portable PCs
Method	Lectures with exercises/practice
Evaluation	Multiple choice questionnaire. Practical exercise of the analysis of fMRI data.
Participants (min/max)	4-20
Calendar	To be determined according to the overall teaching plan
Notes:	Participants should carry their laptop and install the software MATLAB, MRIcron and SPM12. There is a campus licence for MATLAB while MRicron and SPM12 are academic freeware. Year of attendance: indifferent