UNIVERSITÄT TRIER

ICAN
Institute for Cognitive & Affective Neuroscience
@ Trier University

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@ Trier University

ICAN PhD Program

Table of Contents

Statute

Preamble

The PhD program in Cognitive and Affective Neuroscience at the University of Trier offers a structured, research-oriented education for early-career scientists in an interdisciplinary environment. It is supported by seven departments within the Institute for Cognitive and Affective Neuroscience (ICAN), each contributing its specific expertise and methodological diversity to cover a broad spectrum of modern cognitive neuroscience.

The program aims to systematically support PhD candidates in their scientific qualification and to prepare them for a career in research. Through structured training, participants acquire in-depth knowledge in cognitive, affective, and behavioral neuroscience, learn modern methods of experimental research, and receive systematic guidance in their scientific work. Additionally, mentoring and networking opportunities foster exchanges between PhD candidates and national as well as international researchers.

The program provides close integration with ongoing research projects within the participating departments and enables comprehensive training in key areas of cognitive neuroscience. These include the neural foundations of memory, attention, emotion regulation, and action control, social cognition and interaction, as well as psychological stress and strain. Methodologically, the program covers advanced techniques in functional and structural imaging (sMRI, fMRI, DTI, fNIRS), innovative EEG analysis techniques, as well as neurostimulation and biochemical methods.

With its interdisciplinary and methodologically diverse approach, the PhD program provides an excellent foundation for a scientific career in cognitive and affective neuroscience.

Participating Departments

The PhD program is supported by seven departments within ICAN at the University of Trier. These departments, with their specific expertise and research focus, cover a wide range of topics and methods in cognitive neuroscience, providing an outstanding environment for structured postgraduate training.

- General Psychology and Methodology (Prof. Frings; PD Pastötter)
- Biological and Clinical Psychology (Prof. Domes, Dr. von Dawans)
- General Psychology (Heisenberg Prof. Pfister)
- General Psychology: Cognition, Emotion, Action Regulation (Prof. Neumann)
- Cognitive Neuropsychology and Development (Prof. Fandakova)
- Neurocognitive Psychology (Junior Prof. Kamp)

- Cognitive, Affective, and Behavioral Neuroscience with a focus on Neurostimulation (Junior Prof. Kasten)

Objectives

The program complements the individual PhD research project by providing additional qualifications. The overarching goal is to comprehensively prepare participants for a scientific career in cognitive neuroscience. Specifically, the program promotes training in the following areas:

- Structured education in cognitive neuroscience
- Foundations of scientific work
- Practical training in modern methods of cognitive neuroscience
- Mentoring and networking opportunities

Content and Structure

The program covers a broad spectrum of research areas and methods within ICAN, including:

- Cognitive and physiological foundations of action control and attention
- Neural mechanisms of memory
- Social cognition and social interaction
- Neural and endocrine foundations of psychological stress and strain
- Neurocognitive development
- Cognitive and physiological foundations of emotion regulation and rule/norm violations
- Functional and structural imaging: sMRI, fMRI, DTI, fNIRS
- State-of-the-art EEG: oscillations, MVPA, RIDE decomposition
- Stimulation methods: tACS, tDCS, aTVNS
- Biochemical laboratory methods: endocrinology and immunology

The program is designed to last three years. During this period, workshops, lectures, and seminars covering the topics and methods mentioned above are offered on a continuous basis.

Admission and Eligibility

The program is generally open to:

- Enrolled PhD candidates at the University of Trier, Trier University of Applied Sciences, the University of Luxembourg, and PhD candidates at the Medical Campus Trier of the University of Mainz.

PhD candidates whose research topics align with cognitive, affective, and behavioral neuroscience may apply for admission. The ICAN PhD Committee makes individual admission decisions on a case-by-case basis.

Admission priority is based on PhD progress:

1. Newly admitted PhD candidates receive the highest priority.
2. First-year PhD candidates are considered secondarily.
3. Second-year PhD candidates receive the lowest priority.

Application Process

The selection process takes place twice a year at the beginning of each semester. Applications must be submitted by March 31 or September 30. The ICAN PhD Committee makes admission decisions within two weeks. The selection process is transparent and documented. Courses and events typically take place between May and August or November and February.

Application Documents

A complete application includes:

- A structured CV
- Application form (see appendix)

Number of Participants

The number of admitted participants per cohort is limited to a maximum of 12.

Completion

Upon successful completion of the PhD program, participants receive a certificate and a transcript of records issued by the faculty dean, confirming their participation and fulfillment of all program requirements.

Description ICAN PhD Program

Welcome to the structured PhD program of the Institute of Cognitive & Affective Neuroscience (ICAN). Located in Trier, a city rich in history and culture, and characterized by its strong academic culture, our program aims to elevate the city's reputation as a prime location for advanced studies in cognitive neuroscience. It is designed to foster academic excellence and professional development, providing a comprehensive and flexible curriculum that equips students with cutting-edge skills and knowledge in the field of cognitive neuroscience. Here, at the crossroads of academia and practice, we offer an unparalleled educational experience supported by a diverse network of experts and state-of-the-art resources.

Program Structure and Features

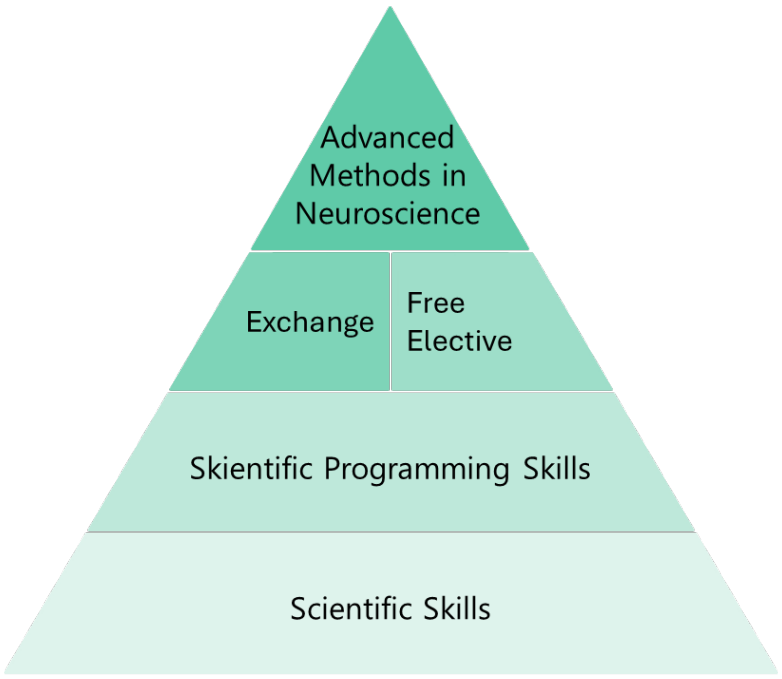
The PhD program is meticulously structured to provide a balanced mix of theoretical knowledge, practical skills, and research experience. Our goal is to cultivate a vibrant academic community where PhD candidates can thrive and collaborate, while also promoting the exchange of knowledge and the development of professional skills necessary for a successful career in neuroscience.

Program Modules

The PhD program is divided into five key modules, each designed to equip students with essential skills and knowledge:

1. **Scientific Programming Skills**: This module provides skills in experimental programming and data analysis that are essential for a successful career in cognitive neuroscience.
2. **Scientific Skills**: This module teaches basic academic skills like paper writing, scientific ethics, and career planning, to provide PhD students with all necessary tools to successfully navigate academia.
3. **Advanced Methods in Neuroscience**: This module provides in-depth and state of the art insights into key methods of neuroscience. PhD students select from a variety of workshops on advanced neuropsychological methods, such as fNIRS, fMRI, EEG, eye tracking, tDCS, tACS, tVNS, and Neurochemistry. These workshops are tailored to the interests and research needs of the students.
4. **Free Elective**: Encourages students to shape their own scientific profile by freely choosing academic courses they are interested in outside the confines of ICAN.
5. **Exchange**: This module is designed to bring PhD students into contact with other scientists and foster exchange. As part of this module students will participate in an eight

week lab-exchange, get regular mentoring, and participate in a buddy program that helps young scientists to get started in academia.



Building Blocks

Additional Activities

Supplementary to these modules, the program offers several activities designed to foster social cohesion and to chaperone PhDs during their studies. This includes regular PhD-meetings, social events, and the annual ICAN day.

Key Goals:

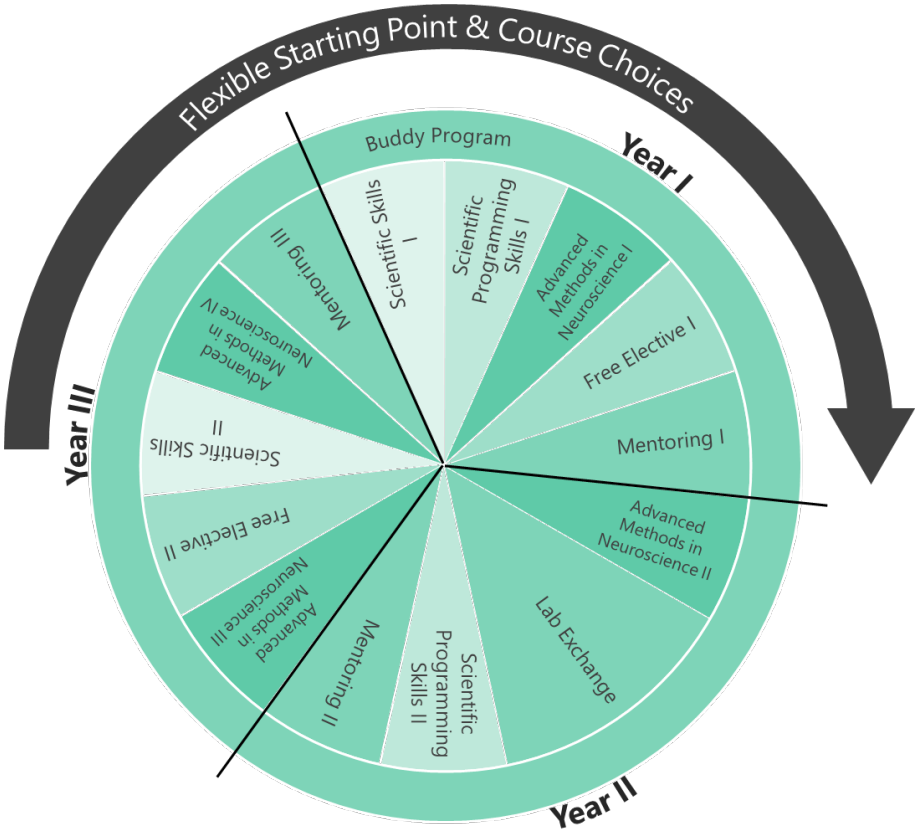
1. **Offering International-Level Training**: We provide PhD training that meets the highest international standards, preparing our graduates for successful careers in academia and beyond.
2. **Promoting Knowledge Exchange**: Our program fosters the sharing and passing on of knowledge, encouraging intellectual growth and innovation.
3. **Strengthening Cohesion and Team Spirit**: We emphasize the importance of collaboration and community within our institute, ensuring a supportive and cohesive environment for all.

Advantages of Our Program:

- **Broad Network of Experts**: Our institute boasts a wide array of specialists in various fields of neuroscience, including renowned psychology professors from Trier University

and the University of Luxembourg, medical professionals from local hospitals, and experts in electrical engineering and logopedics from Trier University of Applied Sciences. This diverse expertise provides PhD students with a rich pool of knowledge and multiple perspectives on cognitive neuroscience.

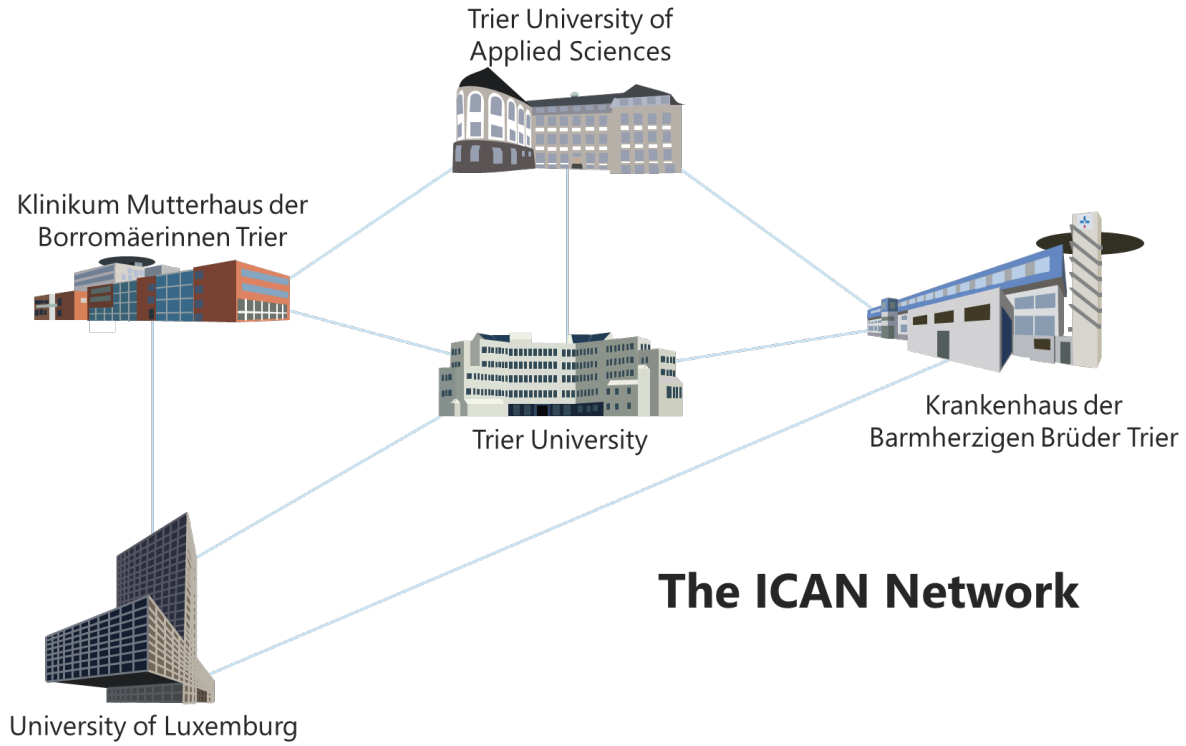
- **Flexibility and Openness**: Unlike many rigid PhD programs, ours is designed to be flexible, allowing students to begin their studies at any time and immediately benefit from our comprehensive program. Additionally, the ICAN PhD program is open to all PhD candidates who are interested in cognitive neuroscience and seek further formal training, not only those who are supervised by ICAN members.
- **Certification**: Upon completion, candidates receive an official certificate from Trier University, signifying their advanced education and training in cognitive neuroscience, which is a significant asset for their future scientific careers.



Program Cycle

Lecturers at the ICAN

The ICAN is a hub for researchers dedicated to exploring the neural basis of human cognition, affect, and behavior. Bringing together neuroscience experts from the Trier area, ICAN fosters collaborative research through regular colloquia, workshops, and training courses, with a special emphasis on nurturing young scientists. Serving as the central scientific platform in the region, ICAN promotes the exchange of expertise and cooperative research efforts in core neuroscientific methods.



Prof. Dr. Christian Frings

- **Institution:** Tier University
- **Department:** Cognitive Psychology
- **Areas of Expertise:** Action Control, Feature Binding, Memory, Executive Functioning, (Multisensory) Perception
- **Neuroscientific Techniques:** EEG, fNIRS, tDCS/tACS, tVNS

Prof. Dr. Gregor Domes

- **Institution:** Trier University
- **Department:** Clinical and Biological Psychology
- **Areas of Expertise:** Social Cognition, Stress, Psychobiology, Clinical Psychology
- **Neuroscientific Techniques:** fMRI, Biochemistry

Prof. Dr. Yana Fandakova

- **Institution:** Trier University
- **Department:** Developmental Cognitive Neuroscience
- **Areas of Expertise:** Developmental Psychology, Task Switching, Memory, Brain Plasticity
- **Neuroscientific Techniques:** fMRI, fNIRS

Jun.-Prof. Dr. Siri-Maria Kamp

- **Institution:** Trier University
- **Department:** Neurocognitive Psychology
- **Areas of Expertise:** Memory, Memory in Clinical Populations and Older Adults, Attention, Executive Functioning
- **Neuroscientific Techniques:** EEG

Prof. Dr. Roland Neumann

- **Institution:** Trier University
- **Department:** General Psychology: Cognition, Emotion, Action Regulation
- **Areas of Expertise:** Emotional Information Processing, Emotion and Behavior, Implicit Social Cognition
- **Neuroscientific Techniques:** Electromyography

Prof. Dr. Roland Pfister

- **Institution:** Trier University
- **Department:** General Psychology
- **Areas of Expertise:** Motor Function, Action Control, Rule Breaking, Statistics
- **Neuroscientific Techniques:** EEG, EMG

Jun.-Prof. Dr. Florian Kasten

- **Institution:** Trier University
- **Department:** Neurostimulation
- **Areas of Expertise:** Effects of Brain Stimulation on Neural Activity and Processing
- **Neuroscientific Techniques:** tDCS/tACS, EEG

Dr. Christoph Geißler

- **Institution:** Trier University
- **Department:** ICAN
- **Areas of Expertise:** Working Memory, Stress, Action Control, Executive Control
- **Neuroscientific Techniques:** fNIRS, tVNS

Dr. Bernadette von Dawans

- **Institution:** Trier University
- **Department:** Clinical and Biological Psychology
- **Areas of Expertise:** Stress, Stress and Development, Stress and Health, Social Interaction
- **Neuroscientific Techniques:** Biochemestry

Dr. Simon Merz

- **Institution:** Trier University
- **Department:** Cognitive Psychology
- **Areas of Expertise:** Motion perception, Multisensory Integration, Number-Space Association
- **Neuroscientific Techniques:** Electrotactile Stimulation

Dr. Bernhard Pastötter

- **Institution:** Trier University
- **Department:** Cognitive Psychology
- **Areas of Expertise:** Action Control, Cognitive Control, Memory
- **Neuroscientific Techniques:** EEG, tDCS/tACS

Dr. Katharina Schwarz

- **Institution:** Trier University
- **Department:** General Psychology
- **Areas of Expertise:** Sense of Agency, Action Selection, Action Motivation, Sustainability Behavior, Mental Wellbeing
- **Neuroscientific Techniques:** fMRT, EEG, Biochemestry

Prof. Dr. Klaus Peter Koch

- **Institution:** Trier University of Applied Sciences
- **Department:** Electrical Engineering
- **Areas of Expertise:** Electrical Diagnostics, Artifact and Signal Transmission, Measurement Techniques, Electromagnetic Artifacts in Electrophysiological Measurements
- **Neuroscientific Techniques:** EEG, ECG

Prof. Dr. Stefanie Jung

- **Institution:** Trier University of Applied Sciences
- **Department:** Logopedics
- **Areas of Expertise:** Language Association, Symbol Learning, Language Processing, Early Literacy Development, Therapeutic Games
- **Neuroscientific Techniques:** fNIRS

Prof. Dr. André Schulz

- **Institution:** University of Luxembourg
- **Department:** Clinical Psychophysiology Laboratory at
- **Areas of Expertise:** Interoception and Interoceptive
- Brain Network Stimulation, Stress, Psychosomatics, Learning and Memory
- **Neuroscientific Techniques:** ECG

Prof. Dr. Robert Kumsta

- **Institution:** University of Luxembourg
- **Department:** Biopsychology
- **Areas of Expertise:** Stress, Gene-Environment Interaction, Epigenetics, Developmental Psychopathology, Mental Health, Oxytocin
- **Neuroscientific Techniques:** Neurogenetics, Biochemistry

Additionally, the departments at Krankenhaus der Barmherzigen Brüder Trier and Klinikum Mutterhaus der Boromäerinnen provide invaluable insights into neuroscience from a clinical application perspective, supplementing ICAN's research with real-world medical expertise. Their collaboration ensures that neuroscientific findings are effectively translated into clinical practice, enriching both research and patient care.

Module Plan

Overview

Module 1. Scientific Programming Skills	Module 2. Scientific Skills	Module 3. Advanced Methods in Neuroscience
Basic in Programming (2 ECTSe)	Scientific Paper Writing (2 ECTSe)	Functional Near-Infrared Spectroscopy (fNIRS) (3 ECTSe)
Data Analysis with R, Matlab and Python (2 ECTSe)	Open Science Practices/ including ethics (2 ECTSe)	Functional Magnetic Resonance Imaging (fMRI) (3 ECTSe)
Programming Experiments in PsychoPy (2 ECTSe)	Scientific Career/ Writing Grant Proposals (2 ECTSe)	Electroencephalogram (EEG) (3 ECTSe)
Module 4. Free elective (examples)	**Module 5. Exchange**	Eye Tracking and Pupillometry (3 ECTSe)
Courses of the GUT (2 ECTSe)	Lab-Exchange (10 ECTSe)	Transcranial Direct and Alternating Current Stimulation (tDCS and tACS) (3 ECTSe)
University didactics (2 ECTSe)	Mentoring Program (1 ECTSe)	Transcutaneous Vagus Nerve Stimulation (tVNS) (3 ECTSe)
	Buddy-Program/ Mentoring (5 ECTSe)	Neurochemistry (3 ECTSe)

Note. For each module, the **ECTS equivalent** (ECTSe) is given as a rough estimate of the module's workload.

Certificate and Partial Achievements

To successfully complete the ICAN PhD program and get the certificate participants must at least fulfill the following achievements:

- **Module 1**: At least 2 out of 3 courses.
- **Module 2**: At least 2 out of 3 courses.
- **Module 3**: At least 4 out of 6 courses
- **Module 4**: At least 2 courses
- **Module 5**: All courses

This amounts to 40 ECTSe points and a workload of 1200 hours.

Note that at least **2/3 of the courses** must be completed at the ICAN.
The Lab Exchange can take place outside the ICAN but not before the official start of the ICAN PhD program.
In addition to the certificate participants get a detailed “**Transcript of Records"** for the ICAN PhD program that specifies their achievements during the ICAN PhD program.

Partial Achievements

Participants that do not complete the ICAN PhD program or guests that just participate in some particular courses can receive records for their achievements within the program:

- **"Certificate of Attendance"** for each attended event
- **Ongoing evaluation of partial achievements** by the ICAN PhD Commission.
- **"Transcript of Records"** of their partial achievement of the ICAN PhD program.

List of modules

Module 1. Scientific Programming Skills

Scientific Programming Skills provides essential training in experimental programming and data analysis. These courses occur regularly in a three-year cycle.

Module Coordinator: Prof. Dr. Roland Pfister

Courses

Basic Programming Skills

Attendance Time: 2 days (16 hours)
Self-study: 44 hours
Total Workload: 60 hours
Content: Basic programming concepts, data types and structures, functions, loops and conditional statements, principles of good coding, documentation and debugging.
Learning Goal: Understanding fundamental concepts in programming, writing small scripts.
Assessment: Coding homework
Detailed description: This two-day workshop introduces basic concepts of programming exemplified using the Python programming language. On day one, participants are introduced to fundamental programming constructs such as loops, conditional statements, data types and data structures and functions. They will learn to apply these concepts using small programming examples that they will finish in self-study. On day two, the course will cover principles of "good coding", i.e. code efficiency and readability (i.e., documentation, naming conventions for variables and functions). Participants will also learn how to identify and handle coding errors, and evaluate the correctness of computer code. Finally, the course will show how coding principles are implemented in other languages such as R, Matlab or C.

Programming Experiments in PsychoPy

Attendance Time: 1 day (8 hours)
Self-study: 52 hours
Total Workload: 60 hours
Content: PsychoPy interface, building routines and loops, custom code, online experiments, PsychoPy outputs.
Learning Goal: Independently program experiments in PsychoPy.
Assessment: Completion and submission of a coding project.

Detailed description: This one-day workshop (4 hours of instruction plus 4 hours of project work) introduces participants to the PsychoPy environment. Participants will learn to navigate PsychoPy's interface, build experimental routines and loops, utilize pre-designed components, and incorporate custom Python code. The workshop also includes designing online experiments and understanding PsychoPy outputs and common pitfalls. Participants will begin a small coding project during the workshop and complete it independently to demonstrate their ability to program experiments in PsychoPy.

Data Analysis with R, Matlab and Python

Attendance Time: 2 days (16 hours)
Self-study: 44 hours
Total Workload: 60 hours
Content: Tidyverse, statistical analyses (outlier analyses, t-tests, ANOVAs, HLM, non-parametric testing), transferring knowledge to Python and MatLab.
Learning Goal: Independently preprocess and analyze experimental data.
Assessment: Completion and demonstration of an analysis pipeline.
Detailed description: Over two days (8 hours of instruction plus 8 hours of project work), this workshop equips participants with data analysis skills using R, Python, and MatLab. Day one focuses on data transformation with Tidyverse, and standard statistical analyses such as outlier detection, t-tests, ANOVAs, hierarchical linear modeling, and non-parametric testing. On day two, these skills are transferred to Python and MatLab, highlighting the similarities and differences between the languages. Participants will start developing an analysis pipeline for their experimental data, which they must complete and demonstrate independently to ensure it is suitable for their data sets.

Module 2. Scientific Skills.

Scientific Skills provides essential training in basic academic skills like paper writing, scientific ethics, acquiring funding, and career planning. These courses occur regularly in a three-year cycle.

Module Coordinator: Prof. Dr. Christian Frings

Courses

Scientific Writing

Attendance Time: 1 day (8 hours)

Self-study: 52 hours
Total Workload: 60 hours
Content: Structure of a scientific paper, writing sections (introductions, methods, results, discussions), use of graphics.
Learning Goal: Write state-of-the-art scientific papers.
Assessment: Submission of a draft paper for structured feedback.
Detailed description: This one-day workshop (4 hours of instruction plus 4 hours of project work) guides participants through the process of writing high-quality scientific papers. Instruction covers the structure of scientific papers and best practices for writing introductions, theory sections, methods, results, and discussions. Participants will also learn how to effectively use graphics to illustrate their research. To complete the workshop, participants must submit a draft of a current paper for structured feedback, aiming to develop the skills necessary to produce state-of-the-art scientific publications.

Open Science Practices/ Ethical Conduct in the Neurosciences

Attendance Time: 1 day (8 hours)
Self-study: 52 hours
Total Workload: 60 hours
Content: Ethical guidelines, open science principles, fraud cases, replication crisis, writing ethics proposals, pre-registration on PsychArchives and OSF, informed consent, writing IRB applications, authorship, plagiarism, scientific fraud
Learning Goal: Understand the importance of scientific ethics and open science.
Assessment: Writing and signing a statement on scientific conduct and open science promotion as well as drafting an IRB application including informed consent
Detailed description: In this one-day workshop, participants will learn about the importance of open science practices. Topics include proper treatment of research participants, open data and open code practices, and unethical practices such as p-hacking and data manipulation. The workshop discusses significant fraud cases and the replication crisis, emphasizing the consequences of improper scientific conduct. Participants will also learn how to write ethics proposals and pre-register studies on platforms like PsychArchives and OSF. To complete the workshop, participants must write and sign a statement committing to ethical scientific conduct and promoting open science. In addition to the general ethical principles of scientific work, the focus will be on the specifics of neuroscientific experiments with humans. These include questions of information, deception about the purpose of the study, debriefing, chance findings, problems with subjects who are unable to give consent and research with vulnerable groups. The workshop should enable participants to write a meaningful application to an IRB or ethics committee that includes all essential aspects of informed consent. In addition to this practical aspect, other ethically relevant topics will be covered, including fraudulent authorship, plagiarism, theft of ideas, abuse of power, falsification of

data, and scientific misconduct in general. Participants will be sensitized to these issues and receive recommendations on how to deal with such situations.

How to Plan a Scientific Career/ Writing Successful Grant Proposals

Attendance Time: 1 day (8 hours)
Self-study: 52 hours
Total Workload: 60 hours
Content: Planning a scientific career, applying for academic jobs, discussion on career hurdles. Designing a research program and writing research proposals
Learning Goal: Gain tools to plan and navigate a scientific career including writing grant proposals.
Assessment: Participation in workshop activities.
Detailed description: This one-day workshop helps participants plan their scientific careers and navigate the academic job market. The workshop covers essential career components such as publishing, teaching experience, and methodological skills, as well as challenges like the "publish or perish" culture, work-life balance, and gender inequality in academia. The workshop aims to provide a realistic picture of an academic career and the tools needed for successful career planning. In addition, participants get the basics to write a proposal according to the guidelines of the German Research Council. Beyond this, participants will learn how to set up a proposal in a manner to maximize their chances of success. This includes proper theoretical introduction that illustrates the importance of the research topic and guides towards the research question and the planned studies, clear and appealing description of the research programme, including the proper use of method graphics, as well as proper formatting of a proposal. The workshop aims to prepare participants for writing their first research proposal.

Module 3. Advanced Methods in Neuroscience

Module 3 Advanced Methods in Neuroscience provides in-depth knowledge and hands-on experience with various neuropsychological methods. Two workshops are selected each year by PhD students through a voting process. Our aim is to offer a program of in-depth methodological training that meets the interests of the majority but also offers the opportunity to get to know new methods. The workshops are offered by external and internal experts on the respective methods.

Module Coordinator: Jun.-Prof. Florian Kasten

Courses

Functional Near-Infrared Spectroscopy (fNIRS)

Attendance Time: 1 day (8 hours)
Self-study: 82 hours
Total Workload: 90 hours
Content: Introduction to fNIRS, a non-invasive imaging technique that measures brain activity by detecting changes in blood oxygenation using near-infrared light.
Learning Goal: Gain basic insight into fNIRS as a neuropsychological assessment tool. After the workshop, participants should be able to understand and judge the merit of fNIRS research papers, set up and conduct fNIRS experiments, as well as analyze and interpret fNIRS data.
Assessment: Participation in workshop activities.
Detailed Description: The workshop will discuss the physiological and technical basics of fNIRS, experimental design, data analysis, and hands-on application. Advantages and disadvantages compared to other neuropsychological methods will be highlighted. Participants will be provided with code examples for fNIRS experiments, data processing, and analysis.

Functional Magnetic Resonance Imaging (fMRI)
Attendance Time: 1 day (8 hours)
Self-study: 82 hours
Total Workload: 90 hours
Content: Introduction to fMRI, a neuroimaging method that measures brain activity by detecting changes in blood flow associated with neural activity using magnetic fields and radio waves.
Learning Goal: Gain basic insight into fMRI as a neuropsychological assessment tool. After the workshop, participants should be able to understand and judge the merit of

fMRI research papers, set up and conduct fMRI experiments, as well as analyze and interpret fMRI data.
Assessment: Participation in workshop activities.
Detailed Description: The workshop will discuss the physiological and technical basics of fMRI, experimental design, data analysis, and hands-on application. Advantages and disadvantages compared to other neuropsychological methods will be highlighted. Participants will be provided with code examples for fMRI experiments, data processing, and analysis. The second part of the workshop provides an in-depth introduction to Voxel-Based Morphometry (VBM) and Surface-Based Morphometry (SBM) using the CAT12 toolbox in SPM. Participants will gain theoretical insights into structural MRI processing and practical experience with preprocessing pipelines, segmentation, normalization, and statistical analyses. Hands-on sessions will cover quality control, region-of-interest analyses, and group-level comparisons.

Electroencephalogram (EEG)
Attendance Time: 1 day (8 hours)
Self-study: 82 hours
Total Workload: 90 hours
Content: Introduction to EEG, a non-invasive technique that records electrical activity of the brain through electrodes placed on the scalp.
Learning Goal: Gain basic insight into EEG as a neuropsychological assessment tool. After the workshop, participants should be able to understand and judge the merit of EEG research papers, set up and conduct EEG experiments, as well as analyze and interpret EEG data.
Assessment: Participation in workshop activities.
Detailed Description: The workshop will discuss the physiological and technical basics of EEG, experimental design, data analysis, and hands-on application. Advantages and disadvantages compared to other neuropsychological methods will be highlighted. Participants will be provided with code examples for EEG experiments, data processing, and analysis.

Eye Tracking and Pupillometry
Attendance Time: 1 day (8 hours)
Self-study: 82 hours
Total Workload: 90 hours
Content: Introduction to eye tracking and pupillometry, techniques that measure eye movements and pupil size to infer cognitive, neural, and emotional states by analyzing gaze patterns and pupillary responses.
Learning Goal: Gain basic insight into eye tracking and pupillometry as neuropsychological assessment tools. After the workshop, participants should be able to understand

and judge the merit of eye tracking and pupillometry research papers, set up and conduct eye tracking and pupillometry in their experiments, as well as analyze and interpret eye tracking and pupillometry data.
Assessment: Participation in workshop activities.
Detailed Description: The workshop will discuss the physiological and technical basics of eye tracking and pupillometry, experimental design, data analysis, and hands-on application. Participants will be provided with code examples for eye tracking and pupillometry experiments, data processing, and analysis.

Transcranial Direct and Alternating Current Stimulation (tDCS and tACS)
Attendance Time: 1 day (8 hours)
Self-study: 82 hours
Total Workload: 90 hours
Content: Introduction to tDCS and tACS, non-invasive brain stimulation methods that modulate neuronal activity by applying low electrical currents to the scalp.
Learning Goal: Gain basic insight into tDCS and tACS as neuropsychological assessment tools. After the workshop, participants should be able to understand and judge the merit of tDCS and tACS research papers, as well as to set up and conduct tDCS and tACS experiments.
Assessment: Participation in workshop activities.
Detailed Description: The workshop will discuss the physiological and technical basics of tDCS and tACS, experimental design, including ethical and safety aspects, and hands-on application. Advantages and disadvantages compared to other neuropsychological methods will be highlighted. Participants will be provided with code examples for tDCS and tACS experiments.

Transcutaneous Vagus Nerve Stimulation (tVNS)
Attendance Time: 1 day (8 hours)
Self-study: 82 hours
Total Workload: 90 hours
Content: Introduction to tVNS, a non-invasive method that stimulates the vagus nerve through the skin to influence brain activity and autonomic functions.
Learning Goal: Gain basic insight into tVNS as neuropsychological assessment tool. After the workshop, participants should be able to understand and judge the merit of tVNS research papers, as well as to set up and conduct tVNS experiments.
Assessment: Participation in workshop activities.
Detailed Description: The workshop will discuss the physiological and technical basics of tVNS, experimental design, including ethical and safety aspects, and hands-on application. Advantages and disadvantages compared to other neuropsychological methods will be highlighted. Participants will be provided with code examples for tVNS experiments.

Neurochemistry

Attendance Time: 1 day (8 hours)
Self-study: 82 hours
Total Workload: 90 hours
Content: Introduction into neurochemistry and the analysis of saliva and blood samples.
Learning Goal: Gain basic insight into enzymatic and hormonal markers in saliva and blood as neuropsychological assessment tools. After the workshop, participants should have a basic understanding of key neurochemical processes and be able to understand and judge the merit of hormone and enzyme analyses in research papers.
Assessment: Participation in workshop activities.
Detailed Description: The workshop will give a broad overview of key neurochemical processes. Subsequently, the hypothalamic-pituitary-adrenal axis and the locus coeruleus noradrenergic system will be discussed in more detail. In the second part of the workshop, the chemical analysis of blood and saliva samples will be shown and discussed, with a focus on cortisol and α-amylase.

Module 4. Free elective

Courses in Module 4. Free elective can be taken at other Universities, at the GUT (the overarching PhD program of Trier University) or other institutes. The ICAN PhD Commission evaluates these external achievements and confirms that courses worth of 4 ECTSe are submitted.

Module Coordinator: Prof. Dr. Gregor Domes

Module 5. Exchange

The module fosters exchange and networking across different levels of expertise and knowledge for the participants. It includes the Lab-Exchange, Buddy program and mentoring.

Module Coordinator: Prof. Dr. Yana Fandakova

Courses

Lab Exchange

The Lab Exchange program facilitates a broader educational experience by allowing PhD students to work in the lab of their second supervisor for approximately 8 weeks.

Planning: At the beginning of the PhD with supervisors.
Activities: Participation in lab meetings, colloquia, and a research project in another lab.
Total Workload: 308 hours
Assessment: Write 2 pages excerpt about the lab exchange
Goal: Broaden education, promote knowledge exchange within and outside ICAN.
Detailed description: There are twelve labs in the ICAN, all of which have different research topics, different research methods, and different workflows. Additionally, the ICAN cooperates with the departments of the Krankenhaus der Barmherzigen Bürder Trier and Klinikum Mutterhaus der Boromäerinnen Trier. This diverse structure allows PhDs broad insight into and different perspectives on neuroscientific research. To leverage this potential fully, each ICAN PhD will participate in a lab exchange of about ten weeks. The exchange will be planned at the beginning of the PhD, by the PhD candidate and their two supervisors, to make sure that it fits into the overarching plan for the PhD. Usually, the exchange department will be the lab of the second supervisor. However, in justified exceptions, different arrangements can be made. The following departments are eligible for exchange program:

I. Department for Cognitive Psychology at Trier University
II. Department for Biological and Clinical Psychology at Trier University

III. Department for Developmental Cognitive Neuroscience at Trier University
IV. Department for Neurocognitive Psychology at Trier University
V. Department for General Psychology: Cognition, Emotion, Action Regulation at Trier University
VI. Department for General Psychology at Trier University
VII. Department of Neurostimulation
VIII. Department for Electrical Engineering at Trier University of Applied Sciences
IX. Department for Logopedics at Trier University of Applied Sciences
X. Clinical Psychophysiology Laboratory at University of Luxemburg
XI. Department of Biopsychology at University of Luxemburg
XII. The departments of the Krankenhaus der Barmherzigen Brüder Trier (upon consultation)
XIII. The departments of the Klinikum Mutterhaus der Boromäerinnen (upon consultation)
XIV. Departments outside the ICAN (upon consultation)

Mentoring Program

The ICAN mentoring program pairs PhD students with a mentor to provide additional support and guidance throughout their PhD journey.

Selection: At the beginning of the PhD with supervisors.
Meetings: Annual 2-hour meeting with the mentor (planned autonomously by the PhD and their supervisor).
Total Workload: 30 hours
Assessment: Documentation of mentoring activities
Goal: Support scientific development through an outside perspective.
Detailed description: At the beginning of the PhD, candidates, in collaboration with their supervisors, select a mentor from among the ICAN members or from external experts in the field. Each year, the PhD student and their mentor will engage in a dedicated two-hour meeting to discuss various aspects of the student's research trajectory, explore potential career paths, and address current challenges and opportunities. The primary objective of this mentoring program is to offer an external perspective that fosters the PhD candidate's scientific development, ensuring a well-rounded and robust academic experience. The PhD Mentoring Program is designed to enhance the academic and professional growth of doctoral candidates by providing them with additional guidance and support beyond their primary supervision.

Buddy Program

Selection: At the beginning of the PhD with supervisors.
Meetings: PhD students organize their buddy meetings at their leisure
Total Workload: 150 hours
Assessment: Documentation of buddy activities
Goal: Support scientific development via peer communication
Detailed description: The PhD Buddy Program pairs each new PhD student with a senior PhD student in their second or third year to help ease the transition into the ICAN community. The senior PhD buddy serves as a guide and support system, assisting the new student in navigating ICAN's processes and integrating into the research environment. This program aims to provide new PhD students with a smoother start and a stronger sense of belonging within the institute, promoting a supportive and collaborative atmosphere from the outset.

Appendix (Templates)

1. ICAN PhD Certificate
2. ICAN PhD Application Form
3. ICAN PhD Transcript of Records
4. ICAN Lab Exchange Form

UNIVERSITÄT TRIER

ICAN
Institute for Cognitive & Affective Neuroscience
@ Trier University

Certificate

The Institute for Cognitive & Affective Neuroscience @Universität Trier (ICAN) and the deanery of department I of Universität Trier certify

<Title> <Name>

Born on the <Date of Birth> in <Place of Birth, Country of birth>

the successful completion of the

ICAN Structured PhD Program

after <he/she/they> duly provided the necessary proofs for completion of:

Module I: Scientific Programing Skills

Module II: General Scientific Skills

Module III: Advanced Methods in Neuroscience

Module IV: Free Elective

Module V: Exchange

Trier, <Date>

ICAN Directors **Dean Department I**

<ICAN Director I> <ICAN Director II> <Dean Department I>

UNIVERSITÄT TRIER

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@ Trier University

Application: Please send this form and a copy of your curriculum vitae (tabular form in PDF format) to ican@uni-trier.de. Deadlines are 31 March and 30 September for entering the programme in the directly following semester (German summer/winter terms).

Personal information

Name: Department:

University: Thesis advisor:

Contract start date:

PhD registration at Trier University: ◯ no ◯ yes - if yes: start date:

Thesis topic:

Abstract (max. 250 words):

Interests (please select all program topics you are interested in)

☐ programming	☐ data analysis	☐ scientific writing	☐ open science
☐ ethical conduct	☐ career planning	☐ grant writing	☐ EEG
☐ fNIRS	☐ fMRI	☐ eye-tracking	☐ tDCS/tACS
☐ tVNS	☐ neurochemistry		
☐ own suggestions:			

TRANSCRIPT OF RECORDS

ECTS: European Credit Transfer System *Europäisches System zur Abrechnung von Studienleistungen*

PhD Program Institute for Cognitive and Affective Neuroscience

Fachbereich I – Psychology

Name of student *Name des Studierenden*	
Date and place of birth *Geburtsdatum und Geburtsort*	
Duration of stay in Trier *Zeitraum des Aufenthaltes in Trier*	

Lecturer *Kursleiter*	**Title of the course unit** *Titel des Kurses*	**Hours / week Weeks / semester** *Kursdauer*	**ECTS equivalents** *Kreditpunkte*

			Total *Gesamt*	

Date **Signature of ICAN directors** **Stamp**

Date **Signature of Dean** **Stamp**

UNIVERSITÄT TRIER

ICAN
Institute for Cognitive & Affective Neuroscience
@ Trier University

Lab Exchange Form (English)

Please send the filled in and signed document to ican@uni-trier.de at the latest four weeks before the start of the exchange. Digital signatures suffice.

Name: Exchange Institution:
First Supervisor: Exchange Supervisor:
Department: Exchange Department:
Subject Exchange Project (max. 250 words):

Start Date: End Date:
Exchange Duration:
Goals of Exchange (key achievements during exchange, max. 250 words):

_____	_____	_____
Signature PhD Student	Signature First Supervisor	Signature Exchange Supervisor