

## Course descriptions

### Term I, 2025-2031, University of Eastern Finland (Joensuu)

#### **Introduction to Developmental and Acquired Language and speech disorders**

Term: First – University of Joensuu (offered by teachers from University of Groningen)

Module: M4 – Neuro-, psycho-, clinical linguistics

Teacher(s): Dr. Vânia de Aguiar, Prof. dr. Roel Jonkers

ECTS: 5

**Goals:** By the end of the course, students will have recent knowledge of developmental and acquired language and speech disorders and they will be able to set up a first short experiment or test to assess these speakers.

#### **Teaching methods: lectures**

Short description: For acquired disorders, after an introduction into the field of aphasia recently published and sometimes even unpublished research in the field of aphasia and related language and speech disorders will be presented. Topics that will be covered are syntactic disorders in aphasia, verb processing in aphasia and speakers with dementia, speech perception problems in aphasia, speech production problems in apraxia of speech, Parkinson's dysarthria.

On the topic of speech and language disorders in children, students will learn about new terminology relevant to the field and the course will focus on how different aspects of language (phonology, morphology, syntax, semantics, and pragmatics) may be disrupted in the presence of a neurodevelopmental disorders and related medical conditions. The students will also learn about theoretical hypothesis, which aim to explain the range of symptoms shown by children with speech and language disorders, and the development language tests for diagnostics and for research.

#### **Assessment:**

Students will prepare a research proposal describing a research project on a topic related to a specific aspect of language disorders in children and/or a specific population of children with language disorders or of speech or language disorders in adults. The proposal should include a clear theoretical background, research questions and hypotheses, a complete method and a timeline.

#### **Language and Languages - A Course on General Linguistics**

Term: First – University of Eastern Finland

Module: M1

Teacher: Prof. Dr. Michael Rießler

ECTS: 5

#### **Goals:**

By the end of the course students will have a solid understanding of recent theories for the study of language and languages underlying the various methods in clinical linguistics research and speech research in general.

#### **Teaching methods:**

Lectures

#### **Short description:**

The course offers a thorough introduction to general linguistics while taking the global linguistic diversity into consideration. It includes three thematic modules: 1) the cultural and social foundations of language and communication, 2) a cross-linguistic views on grammar and pragmatics, and 3) an introduction to specific subfields of empirical, data-driven speech research. The latter topics will be followed up and deepened in the course "Empirical Research Methods". Another encompassing course is the "Linguistic Reading Group".

The lecture course takes place weekly throughout the whole term and is complemented by students' self-studies on the various topics. Every single lecture focusses on one specific topic. Further materials, exercises, and guides for own additional reading will be provided in form of a reader.

The course is informed by a functional-typological understanding of language evolution and will draw on global language comparison, rather than illustrations from the few well-known major languages.

**Assessment:**

There will be two written exams, covering topics from the first and the second modules and accumulating in one final mark. (The third module is continued in the course “Empirical Research Methods”, where the relevant knowledge will be examined in a more practically oriented way and result in a separate mark.)

**Linguistic Reading Group**

Term: First – University of Eastern Finland

Module: M1

Teacher: Dr. Alexandre Nikolaev

ECTS: 3

**Goals:** By the end of this reading group, students will gain familiarity with current linguistic research on language and speech disorders, both developmental and acquired. They will develop skills in critically reading research papers and learn the fundamentals of designing a basic research study.

**Teaching methods:** Lectures and paper discussions.

**Short description:** This reading group introduces students to recent research in the field of language and speech disorders. For acquired disorders, we will explore published and sometimes pre-publication research on aphasia and related topics. Covered areas include syntactic processing, verb processing, speech perception, and speech production in conditions like aphasia, dementia, apraxia of speech, and dysarthria. For developmental disorders, the course will cover current terminology and examine how different aspects of language (phonology, morphology, syntax, semantics, pragmatics) are affected in neurodevelopmental conditions. We will discuss theoretical perspectives and the development of language tests used in research. The focus will be on understanding research methodologies and findings in these areas.

**Assessment:** Short, focused quizzes administered at the beginning or end of class on the assigned readings for that day that will assess basic comprehension of the key concepts, methodologies, and findings of the papers.

**Empirical Research Methods**

Term: First – University of Eastern Finland

Module: M2

Teacher(s): Dr. Alexandre Nikolaev and Prof. Dr. Michael Rießler

ECTS: 5

**Goals:** This course introduces students to the methods for collecting and preprocessing primary data in various subfields of linguistics, with a focus on relevant subfields of speech research, incl. clinical and anthropological linguistics. By the end of the course, students will be able to design a suitable data collection approach, apply both quantitative and qualitative analysis, and report results effectively.

**Teaching Methods:**

- Planning, administering, analyzing, and reporting exercises.
- General introduction sessions followed by group work to design empirical studies, such as experiments or questionnaires.
- Modes of study include lectures, readings, group discussions, and homework assignments. An excursion to Kuopio University Hospital is planned, featuring lectures on TMS and fMRI as well as demonstrations.

**Short Description:** Students will become familiar with methods for collecting and preprocessing linguistic data, using various psycholinguistic techniques like reaction time measurements and eye-tracking, and designing interview and questionnaire studies. The course functions as a hands-on complement of the third thematic module in the lecture “Basic Course in General Linguistics”. It will also cover ethics, including how to apply for ethical review and proper data handling.

An excursion to Kuopio University Hospital is part of the course, during which students will attend lectures and demonstrations on TMS and fMRI. This visit provides practical insights into neuroimaging methods and their application in linguistic research.

**Assessment:** Evaluation based on project results and their presentation, assessed by both peers and teachers.

## Introduction to Python Programming for Linguistic Research

Term: First – University of Eastern Finland, Joensuu (UEF)

Module: M2 – Methods & Statistics

Teacher(s): Alexandre Nikolaev

ECTS: 3

**Goals:** By the end of this course, students will be able to: Apply fundamental programming principles to address linguistic problems; Utilize Python to process, analyze, and visualize linguistic data effectively; Develop Python scripts to automate repetitive tasks encountered in linguistic research; Critically evaluate programming solutions and efficiently troubleshoot errors.

**Teaching methods:** Hands-on programming exercises conducted via Zoom; In-person lectures delivered at the Joensuu campus.

**Short description:** This course provides an introduction to Python programming specifically designed as a core tool for linguistic research. Students will learn to write Python scripts, manage and manipulate linguistic data, and perform data analysis. The course focuses on building practical programming skills applicable to analyzing linguistic datasets and automating common tasks in linguistic research workflows. Topics covered include Python basics, function definitions, text variable manipulation, logical conditions, using Python modules and classes, list management, control loops, file access, and introductory Natural Language Processing (NLP) applications.

**Assessment:** A written exam will assess students' understanding of Python programming principles and their application to linguistic contexts. Programming Exercises: Practical programming exercises throughout the course will contribute significantly to the final grade, evaluating students' ability to implement programming solutions. Grading Criteria: Satisfactory (1-2): Demonstrates basic understanding of Python programming principles with limited application in linguistic contexts. Good (3-4): Shows competent application of Python programming to linguistic data with minor errors or omissions. Excellent (5): Exhibits a deep understanding of Python programming, with creative and accurate applications to linguistic research.

## Introduction to Phonetics and the Praat Tool

Term: First – University of Eastern Finland

Module: M2 Methods & Statistics

Teacher(s): Prof. Dr. Michael Rießler

ECTS: 2

**Goals:** By the end of this course, students will:

- Gain a foundational understanding of core concepts in phonetics relevant to speech and language research.
- Develop practical skills in phonetic analysis, applicable to both clinical and general linguistic research contexts.
- Learn to effectively use the Praat software for speech recording, visualization, analysis, and manipulation.
- Prepare for further study in advanced phonetic methods, including Praat scripting and programming for phonetic research.

**Teaching methods:**

- Lectures introducing fundamental phonetic principles and concepts.
- Hands-on laboratory sessions dedicated to practical exercises using the Praat software.
- Demonstrations of phonetic data analysis techniques within Praat.
- Opportunities for individual and group work on phonetic analysis tasks.

**Short description:** This introductory course provides a comprehensive overview of phonetics and its practical applications in speech and language research. Students will be introduced to the core branches of phonetics, including articulatory phonetics (how speech sounds are produced), acoustic phonetics (the physical properties of speech sounds), and auditory phonetics (how speech sounds are perceived). A significant component of the course will be dedicated to mastering the Praat software, a widely used tool in phonetics. Students will learn to use Praat for recording speech, visualizing speech signals (e.g., spectrograms, waveforms), making acoustic measurements (e.g., duration, pitch, formant frequencies), and performing basic phonetic analysis. The course will emphasize the relevance of phonetics to various fields, including clinical linguistics, speech-language pathology, phonology, and general speech science research. This course serves as a prerequisite for the follow-up course " **Introduction to Praat Script Programming for Clinical Linguistic Research,**" allowing students to build a strong foundation in practical phonetic research methods.

## Assessment:

- **Exercises:** Regular practical exercises throughout the course will assess students' ability to apply phonetic concepts and utilize Praat effectively. These exercises will focus on data collection, analysis, and interpretation using Praat.
- **Project Portfolio (Pass/Fail):** Students will compile a portfolio of their work, showcasing their proficiency in phonetic analysis using Praat. This portfolio will be assessed on a pass/fail basis, requiring demonstration of competency in the core skills taught in the course. Specific requirements for the portfolio will be detailed at the start of the course.

## Statistics and Data Visualisation for Linguistics

Term: First – University of Eastern Finland, Joensuu (UEF)

Module: M2 – Methods & Statistics

Teacher(s): Alexandre Nikolaev

ECTS: 3

**Goals:** Upon successful completion of this course, students will be able to:

- Apply statistical methods and data visualization techniques to linguistic data using the R programming language.
- Create meaningful and effective data visualizations specifically for linguistic research purposes.
- Perform both descriptive and inferential statistical analyses using R packages such as tidyverse and ggplot2.
- Evaluate regression models and implement advanced statistical techniques including mixed-effects models and machine learning approaches.
- Automate data analysis workflows and write custom R functions to enhance research productivity.

**Teaching methods:** Weekly in-person lectures held at the Joensuu campus. Hands-on exercise sessions conducted via Zoom to facilitate practical application of learned concepts.

**Short description:** This course provides an introduction to statistical analysis and data visualization techniques specifically tailored for the field of linguistics. Using R as the primary programming language, students will learn to effectively manage and analyze linguistic data, generate insightful visualizations, and develop statistical models to draw meaningful conclusions for their research. The course covers a range of topics including: R programming fundamentals (variables, vectors, data frames), data loading and manipulation, descriptive statistics, data visualization (boxplots, histograms, advanced ggplot2), linear regression models, model diagnostics, handling categorical and non-linear predictors, mixed-effects models, and an introduction to machine learning techniques like Random Forest for linguistic data. Students will also learn to automate their workflows and write custom R functions to improve efficiency.

**Assessment:** A written exam will assess students' understanding of statistical principles and their application to linguistic data analysis using R.

- **Grading Scale (0-5):** The course will be graded on a scale of 0-5, with the following assessment criteria:
  - **Satisfactory (1-2):** Demonstrates basic understanding of statistical principles and limited ability to apply them in linguistic contexts.
  - **Good (3-4):** Shows competent application of statistical methods and visualization techniques with minor errors.
  - **Excellent (5):** Exhibits creative and accurate application of advanced statistical methods, including the creation of clear and insightful data visualizations.
- **Re-sit:** Re-sit opportunities are available for students who do not pass the course. These are typically scheduled one week after the original exam. Students requiring an additional re-sit must request it from the instructor in advance.

## Introduction to Praat Script Programming for Clinical Linguistic Research

Term: First – University of Eastern Finland, Joensuu (UEF)

Module: M2– Methods & Statistics

Teacher(s): Alexandre Nikolaev

ECTS: 3

**Goals:** Upon successful completion of this course, students will be able to:

- Automate acoustic analysis tasks using Praat scripting for efficient workflows.
- Process and analyze large datasets of speech recordings relevant to clinical linguistics.
- Extract and interpret key acoustic features such as pitch, formants, and intensity from speech data.
- Apply Praat scripting skills to address research questions in clinical linguistic contexts, including areas like voice diagnostics and therapy planning.
- Present and document acoustic analysis results in a clear, reproducible, and professional format.

**Teaching methods:**

- **Lectures:** In-person sessions will introduce core concepts of Praat scripting and demonstrate practical techniques.
- **Workshops:** Hands-on scripting workshops will provide dedicated time for practice and skill development through exercises.
- **Peer Feedback:** Collaborative sessions will involve peer review of scripting solutions and projects to enhance learning and problem-solving.

**Short description:** This hands-on course provides an introduction to Praat script programming specifically for clinical linguistic research. Students will develop practical skills in automating speech analysis workflows using Praat scripting. The course covers fundamental scripting concepts including variables, loops, and conditional logic, applied to automate tasks such as pitch and formant extraction. Students will learn to batch process speech files for clinical datasets, extract and analyze acoustic features like intensity, duration, and spectral characteristics, and apply these techniques for diagnosing voice disorders and evaluating therapy outcomes. Advanced topics include generating visualizations like spectrograms and pitch contours for clinical reports and designing custom analysis workflows for specific clinical populations (e.g., dysarthria, aphasia, stuttering). Emphasis is placed on documenting and sharing scripts to ensure reproducibility in clinical linguistic research.

**Assessment:**

- **Final Project (70%):** A final project will assess students' ability to apply Praat scripting to a clinical linguistic research question. This project will require students to design and implement a script-based analysis and present their findings.
- **Participation (30%):** Active participation, contributing 30% to the final grade, will be evaluated based on weekly submissions of scripting exercises throughout the course, encouraging consistent engagement and practice.
- **Grading Scale (0-5):** The course will be graded on a scale of 0-5, with criteria as follows:
  - **Satisfactory (1-2):** Basic understanding of Praat scripting with limited ability to apply it to acoustic data.
  - **Good (3-4):** Competent application of Praat scripting with minor errors and adequate results for clinical contexts.
  - **Excellent (5):** Creative and efficient scripting solutions with innovative applications to clinical linguistic research.
- **Re-sit:** Students who do not pass the course will have the opportunity to re-sit by submitting an improved version of their final project or completing an alternative case study for reassessment.

## Term II, 2025-2031, Ghent University

### Statistics and Research Methods applied to the development and validation of language research tools

Term: Second – Ghent University, Ghent (UGent)

Module: M2 – Methods & Statistics

Teacher(s): Marc Brysbaert and tba

ECTS: 7

**Goals:** To be able to develop, analyze and validate stimulus lists and language tests in various languages

**Teaching methods:** Short lectures and class exercises with existing data sets.

**Assessment:** Data analysis assignments and students develop a new instrument, analyze the data, and report the results.

**Short description:** Ghent University is well known for the language stimulus sets it provides in multiple languages (word frequency counts, rating studies, AI-generated estimates), and for the tests it has developed to measure individual differences in language proficiency (vocabulary tests with various formats, general knowledge tests, grammar tests, reading comprehension tests, etc.). Students will receive practical instruction on how to create such materials and use data analysis to ensure that the materials have high reliability and validity. As a final assignment, they are asked to develop and evaluate a stimulus set/language test for their own language. Students who share a common language may collaborate on the tests, but each must develop their own materials. This will give students the tools to develop the materials they will need in their future careers.

### Reading Acquisition and Dyslexia

Term: Second – Ghent University, Ghent (UGent)

Module: M4 – Clinical Linguistics and Neurolinguistics

Teacher(s): Louisa Bogaerts

ECTS: 4

**Goals:** (1) To provide an overview of typical reading development and dyslexia, including its potential causes, diagnosis and remediation, with a focus on cross-linguistic differences. (2) To stimulate critical thinking about existing practices across different languages and countries.

**Teaching methods:** Lectures (with invited guest lectures) and independent work.

**Assessment:** Students write a paper about dyslexia in their country/language and present this to their peers.

**Short description:** This course gives an overview of typical reading development and explores dyslexia in depth, examining its key characteristics and the various theoretical frameworks on underlying causes. Students will also learn about diagnostic approaches and evidence-based interventions. Extra attention will be given to language differences and evidence from languages other than English.

### Bilingualism

Term: Second – Ghent University, Ghent (UGent)

Module: M3 – Psycholinguistics

Teacher(s): Robert Hartsuiker and Irina Sekerina

ECTS: 4

**Goals:** Review of basic theories and phenomena of bilingual language processing, the relationship between bilingualism and cognition, and bilingualism and the brain.

**Teaching methods:** Lectures.

**Assessment:** Paper

**Short description:** Students will get a review of research on language processing in bilingualism and second language learning. The students will learn how a bilingual's languages can interact during comprehension or production and whether second language learning conveys cognitive advantages. One lecture will be dedicated to bilingual aphasia.

### **Computational Models in Psycholinguistics**

Term: Second – Ghent University, Ghent (UGent)

Module: M3 – Psycholinguistics

Teacher(s): Rob Hartsuiker

ECTS: 4

**Goals:** To provide a review of computational models and to provide students with hands-on experience in model development.

**Teaching methods:** Lectures and exercises

**Assessment:** Students will design a new computational model and a plan for simulations.

**Short description:** Students will learn about the general principles of computational modelling in cognitive psychology, with an emphasis on neural network models. The first part of the course introduces key concepts such as the building blocks of neural networks and activation rules, Hebbian learning, the delta rule, the backpropagation algorithm, recurrent neural networks, and self-organizing maps. The second part will focus on computational models of language processing (e.g., reading, listening, word production) and will introduce students to simulations of pathological language use. Class exercises are designed to provide hands-on experience in building and running models; for this purpose we will use Python.

### **Advances in Psycholinguistics**

Term: Second – Ghent University, Ghent (UGent)

Module: M3 – Psycholinguistics

Teacher(s): Rob Hartsuiker

ECTS: 3

**Goals:** To provide an in-depth review of timely and theoretically important themes in psycholinguistics.

**Teaching methods:** A flipped classroom approach, with mini lectures that provide context followed by student presentations and discussion. Students read papers at home and discuss them in groups. Each week, one group presents the paper and provides a critique. All other groups prepare short interventions.

**Assessment:** Presentations and interventions (40%); abstract (10%); paper (50%)

**Short description:** This course assumes basic knowledge of psycholinguistics. The course treats three main themes in detail. Students will read 3 thematically related articles per theme and will present and discuss them in class. The themes are hot topics in the field, such as predictive language processing, the relevance of information theory for language processing, and embodied vs. symbolic accounts of semantics.

### **Eye-tracking in Language Research**

Term: Second – Ghent University, Ghent (UGent)

Module: M5 – Neurotechnology and IT for clinical linguistics

Teacher(s): Esperanza Ramos Badaya

ECTS: 3

**Goals:** To provide hands-on experience with the design of eye-tracking experiments and the analysis of eye-tracking data.

**Teaching methods:** Mini lectures and lab exercises

**Assessment:** Students will design an experiment, acquire data, and perform basic analysis

**Short description:** This is a hands-on course in which students learn about the basics of eye-tracking and see examples of how eye-tracking can be used to answer research questions in psycholinguistics, and in which they learn to work with an EyeLink 1000+ eye-tracker, including presentation software.

## Internship preparation

Term: Second

ECTS: -

Module: M6 - Internship

Teacher: internship coordinator

**Goals:** Prepare the students for the opportunity to obtain experience worldwide

**Teaching method:** group meeting

**Assessment:** tba

**Short description:** These internships will offer students the opportunity to obtain experience worldwide – they can do an internship at one of the academic, clinical and research and development (associated) partners all over the world. The academic associated partners offer courses in complementary fields such as Speech Therapy, Neuropsychology, and Cognitive Neuroscience. The R&D partners develop and/or apply the latest equipment for measuring or interfering with brain activity, as well as the development of cutting-edge digital tools and mobile applications for the assessment and treatment of language disorders. The clinical partners are expert centers in functional neurosurgery of language that apply awake surgery procedures in brain-tumor patients to prevent post-surgical language decline.

## Term III, 2025-2031, University of Groningen

### Advanced course on Developmental and Acquired Language and speech disorders

Term: Third – University of Groningen (RUG)

Module: M4 – Clinical Linguistics and Neurolinguistics

Teacher(s): Dr. Vânia de Aguiar, Prof.dr. Roel Jonkers

ECTS: 5

**Goals:** By the end of this module, students will (1) be aware of the recent advances related to speech and language disorders in adults and children and will (2) be able to design a research project aiming to study a specific aspect of language processing in a particular clinical group.

**Teaching methods:** Research class

**Assessment:** students do a small research project and report on it via an essay or a poster/lecture.

**Short description:** In this research module, students will learn about a range of advances in research relevant to the field of language disorders in children and Acquired Language disorders.

Topics on language disorders in children will cover both research on children with developmental language disorder (DLD) and children with acquired language disorders (e.g., after a brain tumor), topics including word learning ability and processes, syntactic and semantic constraints in novel word learning, verb and sentence processing, psycholinguistic evaluation of spontaneous speech, and neuroanatomical and neurofunctional correlates of language impairments.

For acquired language disorders, the focus is on diagnosis and treatment of acquired speech and language disorders, the role of speech analysis in the diagnosis of dementia, spontaneous speech analysis, and cognitive communication disorders and on aphasia therapy and recovery.

**Assessment:** All students conduct a literature review (50% of final grade). For the final assignment, (50% of final grade) students develop a relevant experiment or test in their own language. This can be the same test or experiment as they developed for the introductory class. The experiment should be meant to test children or adult speakers with speech or language problems. The students learn how to develop a tool that can test their hypothesis, how to make a score form, think of the procedure, informed consent etc. and test control subjects to pilot their test. They write a short essay on the outcomes of this study, which will be graded.

### **Apps and Games in Clinical Linguistics**

Term: Third – University of Groningen (RUG)

Module: M5 – Neurotechnology and IT for clinical linguistics

Teacher(s): Dr. Dörte de Kok

ECTS: 5

**Goals:** To create a concept for a serious game in the area of speech and language disorders; to be familiar with methods used in game and app design

**Teaching methods:** Classes, excursions, guest lectures

**Assessment:** Groups of students will develop a game concept. They will present this concept in a pitch (40% of the grade) and write a written report describing the concept and how it addresses the needs of the target population (40%). There is also an individual written assignment during the course period on the first steps of Design Thinking (20%).

**Short description:** Modern technologies afford health care professionals and researchers more opportunities to design tests and tools that facilitate diagnostics and intervention. In this course, students are introduced to the fields of app development, serious gaming and VR in order to prepare them to take leading roles in development projects. The course is structured according to the steps of *Design Thinking*. During the course, examples of apps used in the area of clinical linguistics will be introduced as examples, but students will mainly focus on developing their own game concept.

### **Language testing in awake brain surgery (LTABS)**

Term: Third– University of Groningen (RUG)

Module: M4 – Clinical Linguistics and Neurolinguistics

Teacher(s): Dr. Adrià Rofes

ECTS: 5

**Goals:** To integrate theory and experimental work in the field of awake surgery; to develop materials and new ideas for research

**Teaching methods:** MOOC, Research class

**Assessment:** Popular science article and project abstract (50-60% of final mark); poster, oral presentation and language test sample (40%). A surprise multiple-choice exam may be administered (10%).

**Short description:** We will explore the origins and relevance of LTABS; types of tasks used before/after and during surgery; the language impairments that patients have; and some of the relations between the awake brain surgery literature and other aphasia literature. We will also learn about practical aspects such as how to design, write instructions, and administer/score a test; neurosurgical and anesthesiologic issues in clinical practice; and advanced research topics in this area.

### **Neuroimaging and Language**

Term: Third – University of Groningen (RUG)

Module: M5 – Neurotechnology and IT for clinical linguistics

Teacher(s): Dr. Srdjan Popov

ECTS: 5

**Goals:** To acquire basic knowledge of major neuroimaging techniques and their application in language research; to come up with an original language-related research question using event-related potentials

**Teaching methods:** Research class

**Assessment:** Assessment consists of a test (50%) and a written research proposal (50%) as the exam.

**Short description:** The course is split into two halves. In the first half, we will discuss (some of) the major neuroimaging techniques used in language research, for example, fMRI, MEG, EEG/ERPs, TMS... Here, the focus will be on localization techniques, mostly fMRI and fNIRS. The second half of the course will be dedicated to language processing using ERPs. Students will learn about the application of ERPs in language research, and how to prepare a research proposal for an ERP study on language processing.

## Research Master Internship

Term: Fourth – affiliated with one of the three partner universities

ECTS: 15

Module: M6 - Internship

Teacher: One of the three partners who acts as internship supervisor

**Goals:** Offer students the opportunity to obtain experience worldwide

**Teaching method:** Supervision

**Assessment:** Internship Report

**Short description:** These internships will offer students the opportunity to obtain experience worldwide – they can do an internship at one of the academic, clinical and research and development (associated) partners all over the world. The academic associated partners offer courses in complementary fields such as Speech Therapy, Neuropsychology, and Cognitive Neuroscience. The R&D partners develop and/or apply the latest equipment for measuring or interfering with brain activity, as well as the development of cutting-edge digital tools and mobile applications for the assessment and treatment of language disorders. The clinical partners are expert centers in functional neurosurgery of language that apply awake surgery procedures in brain-tumor patients to prevent post-surgical language decline.

## Term IV, 2025-2031

### Research Master Thesis

Term: Fourth – affiliated with one of the three partner universities

ECTS: 30

Module: M7

Teacher: One of the three partners who acts as internship supervisor

**Goals (learning skills):** The thesis forms the proof that a student can carry out independent research at a level that demonstrates his/her capacities to participate in the international debate on his/her topic. The level of the argumentation and the mastery of the relevant literature should be such that the thesis could be re-worked into an article that may be submitted to an academic journal.

**Teaching method:** Supervision

**Assessment:** Students report on their research by writing a Master thesis. This task is supervised on an individual basis. In addition, students present their thesis, in which progress on the thesis is discussed. See the Thesis rules and regulations for the requirements for a EMCL++ Master thesis.

**Short description:** The EMCL++ thesis is one of the most important instruments for determining whether a student has achieved the learning outcomes for the EMCL++ programme. The students put what they have learned (knowledge, understanding and skills in their subject area) into practice by setting up and carrying out a substantial and academically sound research project. For this purpose, an unambiguous problem definition is formulated (also known as the research question or central question), which can be split into sub-questions if necessary. A well-formulated problem definition is essential for the success of a research project. It gives direction to the research and determines which materials need to be studied. The sub-questions give structure to the research and determine how the thesis is subdivided.