



Evolutionary Language Science

Master Mono 120

Modulkatalog

Aktualisiert am 05.06.2026



Einleitung

Der Modulkatalog hilft Ihnen bei der Planung Ihres Studiums, indem er Ihnen eine Übersicht über alle Module Ihres Studienprogramms bietet. Das Dokument enthält folgende Rubriken:

- Übersicht über die Modulgruppen Ihres Studienprogramms
- Übersicht über die Module in den Modulgruppen
- Katalog der Pflichtmodule, Wahlpflichtmodule und Wahlmodule

Der Modulkatalog ist ein Informationsdokument und nicht rechtsverbindlich. Zu Beginn jedes Semesters wird eine aktuelle Version auf die Website der Philosophischen Fakultät hochgeladen.



Übersicht über die Modulgruppen

06M-7274i01	Foundations and Methods
06M-7274i02	Phylogenetic Origins of Human Communication
06M-7274i03	Language Change over Millennia
06M-7274i04	Ontogenesis of Language
06M-7274i05	Language Processing within Seconds
06M-7274i06	Language in the Future
06M-7274i07	Mathematical and Scripting Methods
06M-7274i08	Research Related Competences
	Abschlussarbeit

Übersicht über die Module in den Modulgruppen

06M-7274i01	Foundations and Methods	Modultyp	ECTS
06SM274-501	Interdisciplinary Primer on Language Evolution Research	Pflicht	6
06SM274-502	Introduction to Evolutionary Language Science	Pflicht	3
06SM274-503	Statistical Methods for Evolutionary Language Science	Pflicht	6
06M-7274i02	Phylogenetic Origins of Human Communication	Modultyp	ECTS
06SM272-510	Linguistic Theory in Evolutionary Perspective	Wahlpflicht	6
07SMBIO133	BIO 133 Evolutionäre Anthropologie	Wahlpflicht	3
07SMBIO201	BIO 201 Primate Evolutionary Biology	Wahlpflicht	3
07SMBIO202	BIO 202 Comparative Communication and Cognition	Wahlpflicht	6
07SMBIO203	BIO 203 Great Ape Behaviour	Wahlpflicht	6
07SMBIO207	BIO 207 Comparative Systematics and Evolution of Primates	Wahlpflicht	2
07SMBIO208	BIO 208 Current Debates in Evolutionary Biology and Human Evolution	Wahlpflicht	6
07SMBIO210	BIO 210 Human Behavioural Ecology and Cultural Evolution	Wahlpflicht	6
07SMBIO211	BIO 211 Primate Behavior and Cognition: Concepts, Methods and Tools	Wahlpflicht	6
07SMBIO212	BIO 212 Language evolution: insights from animal communication	Wahlpflicht	3
07SMBIO215	BIO 215 Evolution of Human Life History	Wahlpflicht	3
07SMBIO216	BIO 216 Primate origins of human sociality, cognition, and mind	Wahlpflicht	3
07SMBIO219	BIO 219 Evolution of the Human Brain, Cognition, and Language	Wahlpflicht	3
07SMBIO262	BIO 262 Evolutionary Morphology of Vertebrates - Issues and Methods	Wahlpflicht	6
07SMBIO266	BIO 266 Fieldwork in Swiss Palaeontology and Natural History Museums: Ice Age	Wahlpflicht	2
07SMBIO267	BIO 267 Paleobiology and Evolution of Vertebrates	Wahlpflicht	6
07SMBIO280	BIO 280 Animal Domestication and Human/non-human animal interactions	Wahlpflicht	3
07SMBIO353	BIO 353 Animal Behaviour Field Studies	Wahlpflicht	6
07SMBIO386	BIO 386 Sociobiology of Communication	Wahlpflicht	3
07SMBIO387	BIO 387 Sociobiology in Animals	Wahlpflicht	6
07SMBIO402	BIO 402 Philosophy of Science with a Focus on Biology	Wahlpflicht	3
07SMBIO437	BIO 437 Human Adaptation	Wahlpflicht	3
06M-7274i03	Language Change over Millennia	Modultyp	ECTS
06SM272-504	Conditions of Language Dynamics	Wahlpflicht	6
06SM272-506	Statistical Modeling of Language Dynamics	Wahlpflicht	6
06SM272-513	Field Methods: Elicitation Techniques	Wahlpflicht	6
06SM272-515	Linguistic Analysis and Annotation – Practical Application	Wahlpflicht	6
06SM272-517	Structures in Language Families and Areas	Wahlpflicht	6
06SM272-518	Typologies of Linguistic Structures	Wahlpflicht	6
06SM272-519	Diversity of Indo-European Languages	Wahlpflicht	9
06SM272-521	Qualitative Reconstruction	Wahlpflicht	9
06SM273-501	Languages of the World	Wahlpflicht	6
06SM721-001	Einführung in die Ethnologie	Wahlpflicht	6
06SM721-004	Fachgeschichte	Wahlpflicht	9
07SMBIO115	BIO 115 Evolution der Menschen	Wahlpflicht	2



07SMBIO373	BIO 373 Next Generation Sequencing for Evolutionary Functional Genomics	Wahlpflicht	6
07SMBIO395	BIO 395 Concepts in Evolutionary Biology	Wahlpflicht	1
07SMEEE326	EEE 326 Principles of Evolution	Wahlpflicht	6
07SMEEE335	EEE 335 Human Evolutionary Genetics	Wahlpflicht	6
06M-7274i04	Ontogenesis of Language	Modultyp	ECTS
06SM272-507	Mechanisms in Child Language Development	Wahlpflicht	6
06SM272-509	Variation in Child Language Development	Wahlpflicht	6
06M-7274i05	Language Processing within Seconds	Modultyp	ECTS
06SM272-006	Phonologie und Phonetik	Wahlpflicht	6
06SM272-522	Practical Exercises in Neurolinguistics and Psycholinguistics	Wahlpflicht	6
06SM272-524	Language and Cognition	Wahlpflicht	6
06SM272-525	Cognitive Neuroscience of Language	Wahlpflicht	6
06SM523-519	Fundamentals of speech sciences and signal processing	Wahlpflicht	6
06SM523-520	Instrumental techniques of phonetic research	Wahlpflicht	6
06SM523-526	Experiments with speech	Wahlpflicht	6
06SM523-527	Voice Analysis	Wahlpflicht	6
07SMBIO344	BIO 344 Development of the Nervous System	Wahlpflicht	3
07SMBME323	BME 323 Brain Disorders	Wahlpflicht	6
07SMINI401	INI 401 Introduction to Neuroinformatics	Wahlpflicht	6
07SMINI435	INI 435 Neural Systems	Wahlpflicht	6
06M-7274i06	Language in the Future	Modultyp	ECTS
03SM22BI0010	Social Computing (L+E)	Wahlpflicht	6
06SM523-112	Language Technology with Multilingual and Multimodal Data	Wahlpflicht	6
10SMSTS-602	Open Source Intelligence (OSINT)	Wahlpflicht	3
10SMSTS-603	Advanced Text Analysis Using Natural Language Processing	Wahlpflicht	1
10SMSTS-604	ChatGPT and Beyond: Interdisciplinary Approaches to AI Literacy	Wahlpflicht	2
06M-7274i07	Mathematical and Scripting Methods	Modultyp	ECTS
03SM22AINF05	Foundations of Computing I (L+E) (Formale Grundlagen der Informatik I)	Wahlpflicht	6
03SM22BI0001	Foundations of Computing II (L+E)	Wahlpflicht	6
03SM22MI0005	Foundations of Data Science (L+E)	Wahlpflicht	6
06SM272-015	Linguistische Datenwissenschaft	Wahlpflicht	6
06SM272-016	Statistik für Linguistinnen und Linguisten	Wahlpflicht	3
06SM523-003	Mathematical Foundations for Language Technology 1	Wahlpflicht	6
06SM523-005	Programming in Language Technology 2	Wahlpflicht	6
06SM523-529	Intermediate Methods and Programming in Digital Linguistics	Wahlpflicht	6
06SM523-530	Eye Tracking and NLP	Wahlpflicht	6
07SMBIO334	BIO 334 Practical Bioinformatics	Wahlpflicht	6
07SMBIO610	BIO 610 Introduction to Machine Learning for Genomics	Wahlpflicht	1
07SMMAT183	MAT 183 Stochastik für die Naturwissenschaften	Wahlpflicht	6
07SMSTA120	STA 120 Introduction to Statistics	Wahlpflicht	5



07SMSTA121	STA 121 Statistical Modeling	Wahlpflicht	5
10SMSTS-506	Get R_eady: Introduction to Data Analysis for Empirical Research	Wahlpflicht	1
10SMSTS-508	Get R_eady: Prognostic & Prediction Modeling in Research	Wahlpflicht	1
06SM523-001	Introduction to Language Technology	Wahl	3
06SM523-002	Programming in Language Technology 1	Wahl	6
06M-7274i08	Research Related Competences	Modultyp	ECTS
06SM274-600	Research Related Competences	Pflicht	30
	Abschlussarbeit	Modultyp	ECTS
06SM274-MA	Master's Thesis	Pflicht	30



Katalog der Pflichtmodule, Wahlpflichtmodule und Wahlmodule

Der Katalog enthält Informationen zu jedem Pflicht- und Wahlpflichtmodul.

Zum Teil finden Sie auch Informationen zu Wahlmodulen [Modultitel in eckigen Klammern]. Beachten Sie, dass die Titel von Wahlmodulen semesterweise wechseln können und dass oft weitere, nicht im Modulkatalog enthaltene Wahlmodule angeboten werden. Diese und alle anderen semesterbezogenen Informationen (wie Veranstaltungstitel, Termine, Dozierende, Informationen zur Buchung) entnehmen Sie dem aktuellen Vorlesungsverzeichnis.



Modulkürzel	06SM274-501
Modulgruppe	Foundations and Methods
Modultyp	Pflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Interdisciplinary Primer on Language Evolution Research

ECTS	6
Lehrformen	Übung, Vorlesung
Allg. Beschreibung	This module includes lectures by experts in the disciplines participating in the study of language evolution, including linguistics and psycho/neuro-linguistics, biology/anthropology, philosophy, psychology, neuroscience, neuroinformatics, computer science/computational linguistics, and mathematics. In addition to the lectures, practical sessions reinforce students' knowledge and deepen their understanding through an interdisciplinary approach.
Lernziel	Students will acquire grounding knowledge in all relevant disciplines in the study of language evolution, with particular foci on theories, concepts and terminology used in evolutionary language science and the conceptual foundations of empirical research in the relevant disciplines. Students will familiarize themselves with key literature in the field.
Unterrichtssprache	Englisch
Voraussetzungen	This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	written exam
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM274-502
Modulgruppe	Foundations and Methods
Modultyp	Pflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Introduction to Evolutionary Language Science

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	The lecture introduces to the key questions in interdisciplinary research on language evolution, focusing on the empirical study of the origins of language and its ongoing dynamic.
Lernziel	Familiarity with central questions and findings in interdisciplinary research on the evolution of language.
Unterrichtssprache	Englisch
Voraussetzungen	Familiarity with basic terms and concepts in at least one of the following disciplines: biology, linguistics, neuroscience, psychology, computer science/ mathematics, acquired during BA studies or in tutorials and pre-courses preliminarily provided within the Master's program. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	written exam
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM274-503
Modulgruppe	Foundations and Methods
Modultyp	Pflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Statistical Methods for Evolutionary Language Science

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	This course explores advanced statistical methods and their underlying concepts, equipping students with the skills necessary for research in evolutionary language science.
Lernziel	Knowledge of the main statistical methods to model language evolution; ability to critically evaluate the results when methods are applied to suitable data.
Unterrichtssprache	Englisch
Voraussetzungen	A solid foundation in Bachelor's-level statistics is required, with some prior exposure to statistical techniques recommended. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	Portfolio: four written exercises throughout term (20%), final written exam (80%). All elements of the portfolio must be completed. If an element is not completed, the entire portfolio is considered not completed and the module is therefore failed.
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM272-510
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Linguistic Theory in Evolutionary Perspective

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	By identifying the key components of human language, this course determines what exactly makes human language unique. Key theories about the evolutionary genesis of language will be addressed and complemented with an analysis of core theories of linguistics and their implications for the evolution of language.
Lernziel	Knowledge of components that distinguish language from other communication systems; analysis of core linguistic theories within an evolutionary framework.
Unterrichtssprache	Englisch
Voraussetzungen	Basic concepts of key concepts in linguistic analysis.
Leistungsnachweis	Portfolio: 50% Referat (mehrere Kurzreferate oder ein grössres Referat), 50% schriftliche Arbeit
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (Beginn im Frühjahrssemester)



Modulkürzel	07SMBIO133
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 133 Evolutionäre Anthropologie

ECTS	3
Lehrformen	Praktikum, Vorlesung mit integrierter Übung, Wiederholungsprüfung
Allg. Beschreibung	Genetik, Fossilreste, vergleichende Anatomie und Verhaltensforschung belegen die Zugehörigkeit des Menschen zu den Primaten. Diese Säugetierordnung stellt Variationen desselben Themas dar. Die wichtigsten Anpassungen und die entscheidenden Etappen der Stammesgeschichte werden vorgestellt. Damit sollen Antworten auf die Fragen: "Wo steht der Mensch im Rahmen der belebten Natur und wie ist er geworden?" gegeben werden.
Lernziel	Nach erfolgreicher Teilnahme am Modul können die Studierenden <ul style="list-style-type: none">- die wichtigsten Merkmale von Primaten und insbesondere von fossilen Hominiden im evolutionären und funktionalen Kontext interpretieren;- die genetische, phänetische und kulturelle Diversität moderner menschlicher Populationen als das Resultat evolutionärer Prozesse erklären;- Gemeinsamkeiten und Unterschiede im Verhalten und den Kognitionsleitungen von Menschen und Tieren, insbesondere Affen, erkennen;- erklären, warum kulturelle Evolution nur bei Menschen vorkommt;- die Frage "Was ist der Mensch?" evolutionsbiologisch fundiert diskutieren.
Unterrichtssprache	Englisch
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO201
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 201 Primate Evolutionary Biology

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	This course integrates evolutionary and ecological approaches to explore the diverse order of the Primates. We will cover anatomy and taxonomy, primate evolution, reproductive strategies, food and foraging, communication, cognition, and conservation. Examples are presented from "the classic" field studies as well as recent studies to illustrate the variation of behaviour across primates.
Lernziel	By the end of this course, students should be able to: -interpret primate socioecology, social behaviour and cognition within an evolutionary framework -understand the significance of these insights for primate conservation
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic knowledge in evolution and behaviour, e.g. BIO 113, BIO 115, and BIO 122
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO202
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 202 Comparative Communication and Cognition

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	This course will give students the opportunity to gain insight into the practicalities of comparative research through working directly with observational and experimental animal data sets collected in the field or in captivity. Students will embark upon self-contained projects where they will generate a research question, process data, conduct analyses and interpret the results within a broader comparative and evolutionary context.
Lernziel	By the end of this course students should: -Have a thorough understanding of the comparative approach and its relevance in unpacking the evolutionary history of human cognitive and communicative skills. -Have an understanding of the scientific method and how it can be used to address questions in the field of animal communication and cognition -Gain competence using various research methods and approaches vital to the study of animal communication and cognition -Gain experience working collaboratively and disseminating research to peers in groups
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic studies completed.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO203
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 203 Great Ape Behaviour

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	This hands-on primatology course provides the opportunity to study current hot topics related to great ape behavioural research, such as communication, culture and conservation. The course is highly interactive and involves Journal Clubs, Meet the Expert sessions (invited speakers), a research project on great ape behaviour (group work in Zoo Zurich), 'How to' sessions (guiding your research project), a written final report, and a final presentation in a student symposium.
Lernziel	By the end of the course students should: <ul style="list-style-type: none">- have a grasp of key scientific literature- be able to design and execute a basic research project- have acquired an advanced level of written and oral communication- be able to produce reports according to scientific standards
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic studies completed; course BIO 201 highly recommended (can be taken before or in the same semester as BIO 203)
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO207
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 207 Comparative Systematics and Evolution of Primates

ECTS	2
Lehrformen	Vorlesung
Allg. Beschreibung	The order Primates comprises many very diverse families, but also peculiar species with multiple unique adaptations, such as aye-ayes, tarsiers, gibbons, or humans. In this course, we will explore the adaptive radiation of living primates and the distinguishing traits of taxonomic groups and representative species. Morphological characteristics are set in relation to behavioural traits such as activity period, locomotion, diet, ranging patterns, social structure and life history. Complementing the lectures, short videos and skeletal material are shown. Following an introduction in comparative phylogenetic studies in R, we will investigate relationships between various traits and test hypotheses about primate and human evolution (code provided).
Lernziel	By the end of this course students should be able to: -recognize typical primate taxa from pictures and skulls -identify distinguishing traits of primate taxa groups -interpret primate morphology, behaviour and life history traits within a comparative evolutionary framework -test hypotheses using phylogenetic comparative analyses in R -explain correlates of primate brain size evolution
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic knowledge in evolution, e.g. BIO 113 or BIO 115
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (einmalig)



Modulkürzel	07SMBIO208
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 208 Current Debates in Evolutionary Biology and Human Evolution

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	This module introduces students to the fundamental theories, methods and findings in evolutionary biology and evolutionary anthropology. It covers the main controversies and current debates in the field including: the role of natural selection vs. mutation in evolution; kin vs. group selection; contingency vs. convergence; selective vs. mechanistic theories of ageing and menopause; sex and sexual selection; animal vs. human culture; recent vs. ancient origins of language; among others.
Lernziel	By the end of the module, students will be able to identify the main topics of debate and research in the fields of evolutionary biology and human evolution. The journal clubs and presentations will develop their ability to critically assess competing theories and produce synthetic evaluations. Two essay-based tutorials will provide individual-level feedback on the highly valuable skills of essay structuring, literature reviewing, and argument presentation in writing.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic studies completed.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO210
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 210 Human Behavioural Ecology and Cultural Evolution

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	We will explore the evolution of human behavioural diversity, particularly focusing on the evolution of human cooperation, life history, social structure, mate systems and the origins of culture. We will use a comparative approach between humans and other mammals, and will explore hunter-gatherers case studies. The practical's will involve group experiments on cooperation, competition, problem solving, social learning. The students will work together on research projects that should be presented as a seminar.
Lernziel	By the end of this module students should be able to develop a basic research project, designing the research question, data collection and analyses and deliver this in the form of a seminar.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic studies completed.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO211
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 211 Primate Behavior and Cognition: Concepts, Methods and Tools

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	In this course, you will be introduced to current topics and debates in primate behavior and cognition, with particular emphasis on how studying nonhuman primates can help understand human evolution. You will learn how to empirically approach and implement such ideas via demonstrations and hands-on experience with state of the art methods (e.g. systematic behavioral observations, experimental approaches, data preparation and analysis) and tools (e.g. thermography as non-invasive measure of arousal, automated audio and video recordings, endocrinology). The course will be a mix of lectures, demonstrations and exercises and also includes several excursions to zoo's and the Institute's Primate Stat for the practical parts.
Lernziel	By the end of the course you should be able to (i) identify timely questions in primate behavior and cognition, and (ii) operationalize such questions using state-of-the art observational and experimental methods and technologies.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	BIO216 is a pre-requisite for this course, or equivalent knowledge or the motivation to acquire it during the course. Please contact the module leader if you are not sure regarding the pre-requisites. BIO 216 can be taken in the same semester as BIO211. Basic studies in Biology or Biomedicine should be completed. Students who completed Bio 133 "Anthropologie" are given priority.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO212
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 212 Language evolution: insights from animal communication

ECTS	3
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	<p>This module examines the extent to which cognitive and communicative components of human language exist in non-human animal species.</p> <p>Comparative studies of both wild and captive, as well as closely and distantly related animal species are summarized and placed in a broad framework to examine the phylogenetic age of human language abilities and the socio-ecological conditions underlying the emergence of language.</p>
Lernziel	<p>By the end of the course students should:</p> <ul style="list-style-type: none">-Have a thorough understanding of how the comparative approach can be used to reconstruct the evolution of human language-Have detailed knowledge on the key hallmarks of language and what evidence exists for similar abilities in animals-Develop independent and critical thinking and hone presentation skills
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basics in evolutionary biology and animal behaviour (e.g. BIO 115, BIO 113, and BIO 122)
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO215
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 215 Evolution of Human Life History

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	<p>This course examines the evolution of human development and reproduction through the lens of life history theory. We will begin by outlining the key components of mammalian and primate life histories and identifying the distinctive features of the human pattern, including prolonged childhood, delayed reproduction and extended lifespan. A central focus of the course will be on hominin fossil evidence: for each major hominin species, we will explore what&nbsp;is currently known about its life history profile and integrate this with archaeological and morphological evidence related to diet, behavior, and ecology. Special attention will be given to the role of cooperative breeding in shaping the human life history strategy and its deep connections to the evolution of our uniquely social cognition and complex cooperative behavior.</p>
Lernziel	<p>By the end of the course, students will be able to:</p> <ul style="list-style-type: none">- Describe the key elements of life history theory and compare life history traits across mammals, great apes, and humans- Critically evaluate the evidence used to reconstruct life history profiles in extinct hominines, including dental development, skeletal growth, and other fossil indicators- Integrate fossil, archaeological, and comparative data to infer patterns of diet, behavior, and morphology in extinct hominin species- Explain how cooperative breeding and extended juvenile dependency are linked to the evolution of human sociality and cognition- Assess major hypotheses about the evolution of the human life history strategy and evaluate them in light of empirical evidence- Apply life history theory and comparative data to broader questions about human evolution and adaptive niche
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	BIO133
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO216
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 216 Primate origins of human sociality, cognition, and mind

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	This course aims at exploring the current state of the art of research in primate cognition. To do so, we will first provide an overview over the fastly growing field of comparative psychology, identifying cognitive capacities across primates in various social and non-social domains, with data from both the wild and captivity. Based on the comparative approach, we will then discuss various hypotheses of primate cognitive evolution that have been proposed to explain this pattern, and ultimately ask whether and how this approach can help us to understand the evolutionary pathways that have led to our own cognitive capacities, but also more complex features of the human mind including general intelligence, language, normativity and morality.
Lernziel	After the course, students should be able to <ul style="list-style-type: none">- Provide an overview of cognitive performance of the different primate taxa across different domains- Critically evaluate cognitive task performance: - Do tasks really measure what they are supposed to measure? - Can results be explained by alternative mechanisms?- Summarize the most prominent hypotheses on primate cognitive evolution, and critically evaluate them based on the available body of empirical data- Explain how data on primate cognitive performance can be used to test hypotheses about the evolution of cognition- Be able to apply this knowledge to human evolution
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO219
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 219 Evolution of the Human Brain, Cognition, and Language

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	The module offers a new perspective on human cognition in the light of advances in machine learning and artificial intelligence. It starts by contrasting brains in humans and other species. Next we compare ecological, social and cultural models of cognitive evolution in primates. Finally we address language evolution by examining the views of Skinner and Chomsky; fossil, comparative and genetic evidence; and the impact of Large Language Models. The module offers a fresh view of cognitive studies based on Turing's concept of machine intelligence, models of cultural intelligence, and the role of gene-culture coevolution in our species.
Lernziel	The main objective of the module is to introduce students to current debates on the evolution of human brain and cognition. By the end of the module, students should be able to: <ol style="list-style-type: none">1. Understand the fundamental problems and concepts of cognitive science2. Understand current evolutionary theories of language3. Critically assess contrasting theories describing human unique cognitive features
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Advanced BSc and MSc students
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO262
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 262 Evolutionary Morphology of Vertebrates - Issues and Methods

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	<p>This course presents an overview of many of the comparative approaches to study organismic evolution of vertebrates in an evolutionary and ecological framework. Although the course deals with vertebrates in examples and case studies, many of the issues apply to other organisms as well. The main topics covered are: introduction to systematics and the analysis of morphological characters, morphometrics, the development and evolution of several organ systems (e.g., teeth, guts) or embryological structures (e.g., neural crest), growth, allometry, heterochrony, modularity and integration, comparative embryology, the importance of the fossil record, and the study of patterns of vertebrate evolution and palaeobiology.</p> <p>Activities include talks by the course directors and associates, projects and presentations for participants, and many practical exercises involving study of specimens of different kinds (skeletons, embryos). Computer-based activities include those introducing basic systematic methods and 3D reconstructions of images generated by computer tomography scans or of embryological structures based on histology.</p>
Lernziel	<p>On completion of this module, the students should be able to</p> <ul style="list-style-type: none">- discuss the basic principles and terminology of the evolutionary morphology methods to study character evolution, developmental evolution, and morphometrics.- understand the main changes that characterise the evolution in vertebrates of the following character complexes: limbs, teeth, ear, digestive system (mammals), muscle and bone. <p>Key skills</p> <p>On completion of this module, the students should be able to</p> <ul style="list-style-type: none">- acquire and analyse data from a short investigation concerning the evolution of a character complex of a vertebrate group- present the results effectively in both written and oral forms
Unterrichtssprache	Englisch
Voraussetzungen	Abgeschlossenes Grundstudium Biologie
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO266
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 266 Fieldwork in Swiss Palaeontology and Natural History Museums: Ice Age

ECTS	2
Lehrformen	Blockkurs
Allg. Beschreibung	After lectures and demonstrations in Zürich (at the Department of Paleontology), excursions and visits to local Swiss museums, research collections and field sites aim at developing an understanding of the evolution of biotic communities. Diverse geological sites are visited, including collection and identification of fossils (vertebrates). Practical activities include introduction to fossil preparation and museum curatorial tasks.
Lernziel	By the end of this module students should be able to 1 recognize the most relevant events and issues in the paleontological history of Switzerland 2 describe the major features of the geological formations and fossil biotas explored during fieldwork and museum visits 3 Examine the use of geological, paleontological, and cartographic databases for quantitative studies of the fossil record and planning of field trips and activities.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	BIO 113, other course(s) in one or all of these disciplines: Zoology / Evolution / Palaeontology
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO267
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 267 Paleobiology and Evolution of Vertebrates

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	The vertebrate fossil record encompasses roughly 520 million years, with the first representatives appearing during the Cambrian explosion. In this long time period, they have produced an enormous variety of forms documented mostly by bones and teeth, but also by traces and soft tissue preservation. Course content: Body plans of important chordate groups; systematic history of vertebrates; transitional forms; comparative anatomy; key features. Aspects of functional and constructional morphology, biomechanics, locomotion, reproduction and nutritional aspects will be discussed and enriched by exercises on fossil and extant material.
Lernziel	At the end of the module, the course participants can <ul style="list-style-type: none">- demonstrate the diversity of fossil and extant vertebrates- analyze vertebrate fossils- reconstruct the biology of extinct vertebrates Comprehensive competences At the end of the module, participants are able to <ul style="list-style-type: none">- take scientific information from the literature and synthesize it- present scientific information in form of public presentation
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	abgeschlossenes Grundstudium
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO280
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 280 Animal Domestication and Human/non-human animal interactions

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	<p>Domestication is a prime example of evolution. The divergent morphology produced by domestication is similar in its extent to that of large groups of organisms that have evolved over millions of years. New conceptual and technical tools can lead to an understanding of the genetic and developmental bases of these morphological changes. This course will address how comparative and quantitative approaches to document the evolution of the phenotype, in parallel to experimental approaches, can provide novel information to understand morphological diversification, also as it relates to evolution in urban environments. The study of the origins and multidimensional consequences of domestication requires contributions from different disciplines, including zooarcheology, ethnology, molecular biology and evolutionary morphology. We will critically integrate, summarize and discuss the latest research results that come from these perspectives. Some lectures and discussions concern the human cultural diversity across the world in relation to our relation to non-human animals beyond domestication.</p>
Lernziel	<p>On completion of the course, the students should be able to</p> <ul style="list-style-type: none">- name the species of mammals, birds, fish and insects that have been domesticated and the antiquity of domestication.- discuss some of the latest developments in organismal, zooarcheological and molecular studies of evolutionary phenomena associated with domestication and its origins.- understand the form-function relation by examples on the life history of domestic animals.- critically discuss ongoing studies on the developmental changes associated with the diversification that has occurred during domestications (e.g., from wolf to diverse dog breeds)- depict the changes in diverse organ systems – brain, guts, teeth, bone – brought about by domestication in diverse species.- be aware of the controversies about the use of domestication as a comparison to understand a phase of human evolution.- have an appreciation of the cross cultural diversity in modes of human/non-human animal interactions (including hunting) as related to diverse ontological perspectives.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	BIO 113, or modules on Evolution or Zooarchaeology for students in other faculties
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO353
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 353 Animal Behaviour Field Studies

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	Do you enjoy watching the behaviour of animals? This course gives hands- on experience in behavioural studies of free-living animals. Students will be taught how to carry out small animal behaviour projects of their choice through a combination of lectures, practice outdoors, and project supervision.
Lernziel	Students will be able to formulate testable hypotheses about why animals behave as they do. They will be able to appropriately record and analyse animal behaviour, and interpret their results. Students will clearly communicate the results of a small project.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic studies completed, including Bio 122, curiosity about animal behaviour and patience in watching animals outside
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO386
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 386 Sociobiology of Communication

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	In this interactive lecture we identify commonalities and communication concepts expressing social behaviour across a diversity of taxa. Based on theoretical and empirical research we unveil both proximate and ultimate mechanisms shaping communication from microbes, to insect, vertebrate and human societies.
Lernziel	By the end of this module each student is able to: <ul style="list-style-type: none">- describe proximate and ultimate mechanisms underlying communication among and within organisms- recognize commonalities of communication across a wide range of systems- show how empirical research and theoretical models fit the conceptual framework- critically evaluate empirical evidence and interpretations- present scientific work in a written essay and present it orally
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic studies completed, passed in BIO 122 (Grundvorlesung in: Verhalten und Verhaltensphysiologie)
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO387
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 387 Sociobiology in Animals

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	In this practical course, students (in pairs of two) choose on a small project in which they collect preliminary empirical data on communication/socio-biology in social organisms and develop a research proposal for a MSc project. Students work in pairs and bring in their own idea of a topic or follow our suggestions. They are expected to work independently and produce a final report in form of a MSc research proposal.
Lernziel	By the end of this module each student is able to: <ul style="list-style-type: none">- apply their knowledge from BIO 386 to a practical project on 'Sociobiology of animals'- identify and formulate a research question and to support it with empirical evidence or literature based arguments- write a scientific proposal (in the style of a MSc thesis proposal) based on preliminary data and / or literature review- perform extensive literature search on a specific topic
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	From 3rd year on. The lecture Bio 386 is compulsory to attend this module.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO402
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 402 Philosophy of Science with a Focus on Biology

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	The lecture starts with a reflection on the discipline of biology. We address questions such as: What is the aim and achievement of this discipline? What kind of question does it address? What methods does it use to address them? How do biological explanations work? What are the basic assumptions on which biological research builds? How is it different from other sciences such as physics? We will look at the particular role of the theory of evolution in biological explanations and analyse key concepts in biology such as 'life' or 'gene' of the lecture, we will also address the connection between biology and ethics in the contexts of the difference between facts and values, evolutionary ethics and the transition from science to technology.
Lernziel	On successful completion of the lecture, the students should: <ul style="list-style-type: none">- Know central concepts and theories in the philosophy of science.- Understand the particular lens through which biology studies the world and be aware of background assumptions and limitations.- Understand the role of evolutionary theory for research and explanations in biology.- Understand the connection between biology and ethics.
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO437
Modulgruppe	Phylogenetic Origins of Human Communication
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 437 Human Adaptation

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	<p>Morphology and genetics of the human body are subject to ongoing evolution. Changes of the environment, disease burden or culture demand constant adaptation.</p> <p>This course consists of a series of different lectures on topics related to human adaptation and aims to cover a spectrum of influencing factors and resulting adaptations in humans.</p> <p>Particular emphasis is placed on physiological and pathological processes. A background in human anatomy, genetic analysis or pathophysiology is highly recommended</p>
Lernziel	<p>By the end of this module each student should be able to</p> <ul style="list-style-type: none">- describe some general mechanisms of evolution from the past to the present- explain examples of human adaptive responses- engage in a scientific discussion on the aetiology of physiological adaptations in humans
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Abgeschlossenes Grundstudium/ completed basic studies
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM272-504
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Conditions of Language Dynamics

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	The course introduces the current state of research on selected cognitive-biological and sociocultural conditions that constrain or shape language change. It teaches in particular how to conceive of theoretical approaches as well as how to choose appropriate methods.
Lernziel	Knowledge of the major cognitive-biological and socio-cultural conditions that constrain or shape language change; knowledge of the methods with which these conditions are researched; ability to formulate research questions to study these conditions.
Unterrichtssprache	Deutsch oder Englisch
Voraussetzungen	Basic knowledge of key concepts in linguistic analysis; knowledge of key concepts of language relatedness and language change. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	Portfolio: 50% presentation (several short presentations or one longer presentation), 50% written paper
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (Beginn im Herbstsemester)



Modulkürzel	06SM272-506
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Statistical Modeling of Language Dynamics

ECTS	6
Lehrformen	Übung
Allg. Beschreibung	This exercise group treats the main statistical methods for modeling language dynamics in space and time. This includes teaching and developing the theoretical basis and assumptions of the models as well as the application of methods to suitable datasets and critical evaluation of the results.
Lernziel	Knowledge of the main statistical methods to model language dynamics in space and time; ability to apply these methods to suitable data and critically evaluate the results.
Unterrichtssprache	Deutsch oder Englisch
Voraussetzungen	Basic knowledge of statistics and probability theory; basic knowledge of key concepts in linguistic analysis; knowledge of key concepts of language relatedness and language change. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	Portfolio (20% written exercises, 80% written paper)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (Beginn im Frühjahrssemester)



Modulkürzel	06SM272-513
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Field Methods: Elicitation Techniques

ECTS	6
Lehrformen	Übung
Allg. Beschreibung	Participants learn and practice how to elicit and analyze language data in cooperation with native speakers. Various tools (e.g. questionnaires and production stimuli) are presented and their use practiced.
Lernziel	Participants are able to detect and analyze linguistic structures through elicitation.
Unterrichtssprache	English
Voraussetzungen	Basic knowledge of key concepts in linguistic analysis. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	Portfolio (50% oral work, 50% written work)
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (Beginn im Frühjahrssemester)



Modulkürzel	06SM272-515
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Linguistic Analysis and Annotation – Practical Application

ECTS	6
Lehrformen	Übung
Allg. Beschreibung	Students analyze and gloss recordings, texts and/or corpora of a selected language with the help of word lists or dictionaries. In the process, they become acquainted with the structure of the language on all levels and acquire skills in handling raw linguistic data.
Lernziel	Ability to make linguistic raw data accessible and to annotate them on the basis of an analysis (glossing).
Unterrichtssprache	English
Voraussetzungen	Basic knowledge of key concepts in linguistic analysis. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	documented practical work in the form of glossed, analyzed data
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM272-517
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Structures in Language Families and Areas

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	The course introduces the main structures of a selected language family and/or of a selected linguistic area. Students read relevant literature and work with different datasets, which they present orally and summarize in the form of a written paper.
Lernziel	Participants gain an overview of the main linguistic structures in a selected language family and/or a selected linguistic area and can apply that knowledge to the analysis of individual languages.
Unterrichtssprache	English
Voraussetzungen	basic knowledge of key concepts in linguistic analysis
Leistungsnachweis	Portfolio (50% oral work, 50% written work)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (Beginn im Frühjahrssemester)



Modulkürzel	06SM272-518
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Typologies of Linguistic Structures

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	The course introduces the typological diversity of selected linguistic structures. Students read relevant literature and work with different datasets, which they present orally and summarize in the form of a written paper.
Lernziel	Participants know the current state of the art in our understanding of the typological diversity of selected linguistic structures and can apply this knowledge to the analysis of individual languages.
Unterrichtssprache	English
Voraussetzungen	basic knowledge of key concepts in linguistic analysis
Leistungsnachweis	Portfolio (50% oral work, 50% written work)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (Beginn im Herbstsemester)



Modulkürzel	06SM272-519
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Diversity of Indo-European Languages

ECTS	9
Lehrformen	Seminar
Allg. Beschreibung	This course treats the diversity of Indo-European languages and the relevance of mechanisms that are responsible for diversity or uniformity. The course also teaches how the Indo-European language family and its member languages differ from other language families, how these profiles change through space and time, and how this can be interpreted to inform reconstruction.
Lernziel	Overview of the diversity of structures in Indo-European languages, and overview of the mechanisms of language change that are responsible for these structures.
Unterrichtssprache	Deutsch/Englisch
Voraussetzungen	—
Leistungsnachweis	oral exam
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes 2. Herbstsemester)



Modulkürzel	06SM272-521
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Qualitative Reconstruction

ECTS	9
Lehrformen	Seminar
Allg. Beschreibung	The course treats methods of qualitative reconstruction within the Indo- European language family, and teaches the skills that are necessary to evaluate reconstructions and to conduct work on reconstructions. It foregrounds the relevance of different data types, reconstruction methods and principles. It covers single branches as well as the whole language family.
Lernziel	Ability to evaluate and discuss reconstructions of the protolanguage and internal protolanguages and to conduct work on qualitative reconstructions.
Unterrichtssprache	Deutsch oder Englisch
Voraussetzungen	—
Leistungsnachweis	documented practical work
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes 2. Herbstsemester)



Modulkürzel	06SM273-501
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Languages of the World

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	The module provides in-depth knowledge of the diversity of languages in a global perspective. The aim is to gain a broader understanding of how languages can differ in their basic phonological, grammatical and lexical structures.
Lernziel	The module enables students to understand differences in linguistic structure and what is constant and what is variable in human language. This will provide a foundation for further study of the sociocultural, biological, historical and phylogenetic drivers of the diversification of languages, to generate hypotheses derived from them and to test them in practice using adequate methods.
Unterrichtssprache	Englisch
Voraussetzungen	—
Leistungsnachweis	schriftliche Prüfung
Notenskala	1-6, in Halbschritten
Repetierbarkeit	keine Wiederholungsmöglichkeit
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM721-001
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institut für Sozialanthropologie und Empirische Kulturwissenschaft

Einführung in die Ethnologie

ECTS	6
Lehrformen	Vorlesung
Allg. Beschreibung	Die Vorlesung Einführung Ethnologie vermittelt ein Grundverständnis und einen Überblick über die Gegenstandsbereiche der Ethnologie. Sie dient Studierenden dazu, einen ersten Einblick in die thematische Breite des Faches sowie in seine Veränderungen im Laufe der letzten Jahrzehnte zu gewinnen. Im Mittelpunkt steht dabei die kritische Auseinandersetzung mit zentralen Konzepten und wissenschaftlichen Traditionen im Fach, sowie die Frage, wie sich ihre Bedeutungen mit der Zeit verändert haben. Neben den zentralen Fragestellungen und Debatten findet auch eine kurze Einführung in die epistemologischen, theoretischen und methodischen Traditionen des Faches statt.
Lernziel	Die Vorlesung hat das Ziel Studierende in das Fach der Ethnologie einzuführen. Hierzu werden die zentralen Konzepte und Gegenstandsbereiche vorgestellt und diskutiert. Dies soll eine kritische Auseinandersetzung auch mit deren historischen Entwicklung ermöglichen. Die Vorlesung stellt die Grundlage für alle kommenden Module des Studiums dar.
Unterrichtssprache	Deutsch oder Englisch: siehe Sprache der Lehrveranstaltung(en)
Voraussetzungen	—
Leistungsnachweis	schriftliche Prüfung
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM721-004
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Institut für Sozialanthropologie und Empirische Kulturwissenschaft

Fachgeschichte

ECTS	9
Lehrformen	Übung, Vorlesung
Allg. Beschreibung	Die Vorlesung gibt einen Überblick darüber, wie die Ethnologie resp. Sozialanthropologie zu dem geworden ist, was sie heute ist, also über die Herausbildung und Entwicklung als eigenständige wissenschaftliche Disziplin in verschiedenen akademischen Traditionen. Studierende verstehen so einerseits, in welchen Schritten sich ethnologische Theorien herausgebildet haben, und zugleich in welchem "Diskursraum" gegenwärtiges ethnologisches Denken stattfindet. Die Beschäftigung mit der Fachgeschichte stellt damit kein Bearbeiten vergangener und irrelevant gewordener Sachverhalte dar, sondern hilft, gegenwärtiges Forschen auf den Erkenntnissen vergangenen Denkens aufzubauen. In der begleitenden Übung werden grundlegende Texte aus der Fachgeschichte diskutiert.
Lernziel	Studierende eignen sich im Rahmen des Moduls Wissen um die wesentlichen Vertreter, theoretischen Strömungen sowie die historische Entstehung und Entwicklung des Faches an.
Unterrichtssprache	Deutsch oder Englisch: siehe Sprache der Lehrveranstaltungen
Voraussetzungen	—
Leistungsnachweis	Portfolio: schriftliche Prüfung 60%, schriftliche Arbeiten 30%, mündliche Beteiligung 10%
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO115
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 115 Evolution der Menschen

ECTS	2
Lehrformen	Vorlesung, Wiederholungsprüfung
Allg. Beschreibung	Grundlage des Kurses sind die Vermittlung von fundamentalen evolutionären Prinzipien und deren Beitrag zur Entstehung von anatomisch modernen Menschen (<i>Homo sapiens</i>). Hierbei wird das Hauptaugenmerk auf die wichtigsten Anpassungen, aber auch die entscheidenden Etappen der Stammesgeschichte gerichtet.
Lernziel	<p>&nbsp;</p> <p>Am Ende des Kurses haben/können die Studierenden</p> <ul style="list-style-type: none">- einen umfassenden Einblick in wichtige evolutionäre Prinzipien.- Diversität moderner menschlicher Populationen als das Resultat evolutionärer Prozesse erklären.- generelle biologische Fragestellungen in einem evolutionären Framework angehen und interpretieren. <p>die Frage «Was ist der Mensch?» evolutionsbiologisch fundiert diskutieren.</p>
Unterrichtssprache	<p>&nbsp;</p> <p>English</p>
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO373
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 373 Next Generation Sequencing for Evolutionary Functional Genomics

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	<p>Next-generation sequencers (NGS) are revolutionizing evolutionary and ecological studies as well as human medical research. Large projects including Human 1000 genomes projects and Arabidopsis 1001 genomes projects have enabled genome-wide association studies (GWAS) to identify genes responsible for common disease and functional changes. Evolutionary biology using NGS is the focus of a University Research Priority Program since 2013. The course provide a broad overview of introductory bioinformatic analysis, theory of evolutionary and ecological genomics, including population genetics, population structure, and GWAS, experimental planning and sample preparation.</p> <p>Instruction for basic programming is provided. The script language R is used for processing sequence data, calculating data statistically, and plotting data.</p>
Lernziel	<p>By the end of the module you should be able to</p> <ul style="list-style-type: none"> - design a research experiment involving biologically relevant issues affecting populations of plants or animals - explain concepts of NGS technologies - perform basic analysis of genome wide polymorphism data using bioinformatics and RNA-seq - translate genetic polymorphism data into meaningful ecological or evolutionary relevant results - identify both the capabilities and limitations of NGS <p>Key skills</p> <p>By the end of the module you should be able to</p> <ul style="list-style-type: none"> - identify key areas of contemporary research using NGS - use basic bioinformatics of large datasets for genetic analyses
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO395
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 395 Concepts in Evolutionary Biology

ECTS	1
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Concepts in evolutionary biology are often used ambiguously, partly because the same terms may have different usage in other fields in biology. The course is designed for graduate students with interdisciplinary projects encompassing evolutionary biology and other disciplines, and provides lectures and simple calculation exercises in population and quantitative genetics.
Lernziel	
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMEEE326
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

EEE 326 Principles of Evolution

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	"Nothing in Biology Makes Sense Except in the Light of Evolution". Evolutionary biology and its methods are essential in all branches of modern biology. This course builds on first year courses in evolutionary biology and deepens the students' understanding of important evolutionary concepts, such as evolutionary change, adaptation, and speciation, underpinned by genetic change, in a combination of lectures and practicals. Most of these practicals will be computer-based.
Lernziel	By the end of the course, the students will be able to: - describe important evolutionary theory and its applications - identify and discuss the core issues from ongoing debates in evolutionary biology - critically assess the presentation of evolutionary research in the popular media Key skills: - approach biological questions from an evolutionary perspective - apply theory and perform data analysis in evolutionary biology
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic studies completed. Basic knowledge in evolution (BIO113: mandatory, EEE103 and other courses on evolutionary biology: highly recommended), basic knowledge of R is required.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMEEE335
Modulgruppe	Language Change over Millennia
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

EEE 335 Human Evolutionary Genetics

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	<p>The course focuses on the evolution of modern humans, their genetic diversity, and their population history as inferred from modern and ancient genetic data. It also presents current knowledge on the role of natural selection and cultural practices in shaping human genetic variation.</p> <p>Besides providing theoretical foundations in population and evolutionary genetics, the course includes research practicals. Students will collect genomic data from public databases and use computational tools to reconstruct demographic histories and detect genetic adaptations. They will also present a scientific publication to the class and participate in group discussions, being encouraged to address not only the research but also its societal impact.</p>
Lernziel	<p>Students will learn how genetic variation is shaped by evolutionary forces such as natural selection, genetic drift, mutation, and migration; how it can be used to reconstruct human population history and evolution; how to handle and process large genomic datasets; and how to test alternative models of population history and infer demographic parameters. They will also become familiar with the distribution of human genetic and cultural diversity across time and space, and reflect on how these diversity patterns have been interpreted historically and at present.</p>
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM272-507
Modulgruppe	Ontogenesis of Language
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Mechanisms in Child Language Development

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	The course introduces different theories prevalent in research on language development, with special attention on the acquisition mechanisms (e.g. statistical learning, generalisation mechanisms) that individual theories postulate. Particular focus is put on the status of cognitive prerequisites in early childhood.
Lernziel	Knowledge of the cognitive-biological and socio-cultural foundations of child language development. In-depth understanding of the basic prerequisites and cognitive mechanisms that underlie language development during ontogeny. Knowledge of the factors (e.g. quantity and quality of the input) that can influence development mechanisms.
Unterrichtssprache	English
Voraussetzungen	Basic knowledge of key concepts in linguistic analysis; knowledge of the central aspects of language development in children and the main methods of their study (corresponding to the content of the BA module "Language Development")
Leistungsnachweis	Portfolio: 50% presentation (several short presentations or one longer presentation), 50% written paper
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (Beginn im Frühjahrssemester)



Modulkürzel	06SM272-509
Modulgruppe	Ontogenesis of Language
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Variation in Child Language Development

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	The course introduces selected topics of language development research, in particular with regard to variation and its reasons. This includes the causes of speaker-specific variation as well as the role of cross-linguistic variation in child language development.
Lernziel	Understanding of the role of individual and cross-linguistic variation in early childhood development, of the environmental factors that can influence individual variation, and of the relevance of research into language development for the understanding of language evolution.
Unterrichtssprache	English
Voraussetzungen	Basic knowledge of key concepts in linguistic analysis; knowledge of the central aspects of child language development and the main methods of their study (according to the content of the BA module "Language Development").
Leistungsnachweis	Portfolio: 50% presentation (several short presentations or one longer presentation), 50% written paper
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (Beginn im Herbstsemester)



Modulkürzel	06SM272-006
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Phonologie und Phonetik

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Die Vorlesung führt in die Grundkonzepte der phonetischen und phonologischen Lautstruktur der Sprachen der Welt und in die wichtigsten Analysemethoden und theoretischen Modelle ein.
Lernziel	Kenntnis von phonologischen und phonetischen Strukturen in den Sprachen der Welt, den Methoden ihrer Analyse und den wichtigsten theoretischen Modellen
Unterrichtssprache	Deutsch und/oder Englisch
Voraussetzungen	—
Leistungsnachweis	schriftliche Prüfung
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM272-522
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Practical Exercises in Neurolinguistics and Psycholinguistics

ECTS	6
Lehrformen	Übung
Allg. Beschreibung	This exercise group teaches how to design and execute neurolinguistic or psycholinguistic research projects with experimental and/or observational paradigms. Students learn how to empirically analyze and operationalize research questions and how to present this research in scientific writing.
Lernziel	Ability to address a neurolinguistic or psycholinguistic research question empirically.
Unterrichtssprache	English
Voraussetzungen	Knowledge of key concepts of neurolinguistic or psycholinguistic research; basic knowledge of statistic methods; basic knowledge of linguistic data science. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	documented practical work
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM272-524
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Language and Cognition

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	This seminar teaches the current state of the art on selected relationships between linguistic and cognitive processes and categories. Students familiarize themselves independently with the specialized literature on the topic. The focus is on the impact that language-specific grammatical and semantic particularities can have on non-linguistic conceptualization, as e.g. examined in research on linguistic relativity.
Lernziel	Knowledge of the main relationships between linguistic and cognitive processes and categories. Understanding how empirical research and theoretical models overlap with conceptual assumptions. Ability to critically evaluate empirical evidence and its interpretation.
Unterrichtssprache	English
Voraussetzungen	Knowledge of the main (neuro-)cognitive processes of language processing and their interaction with non-linguistic cognition and perception; basic knowledge of the corresponding research methods (according to the content of the BA module "Language and Cognitive Processes")
Leistungsnachweis	Portfolio (50% oral work, 50% written work)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semestrig (Beginn im Frühjahrssemester)



Modulkürzel	06SM272-525
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Cognitive Neuroscience of Language

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	This course teaches the current state of the art on selected mechanisms of language production and comprehension. Students familiarize themselves with the specialized literature on the topic.
Lernziel	Knowledge of the main mechanisms of language production and language comprehension
Unterrichtssprache	English
Voraussetzungen	Knowledge of the main (neuro-)cognitive processes of language processing and their interaction with non-linguistic cognition and perception; basic knowledge of the corresponding research methods (corresponding to the content of the BA module "Language and Cognitive Processes"). This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	Portfolio (50% oral work, 50% written work)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (Beginn im Frühjahrssemester)



Modulkürzel	06SM523-519
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Fundamentals of speech sciences and signal processing

ECTS	6
Lehrformen	Vorlesung
Allg. Beschreibung	Experience the captivating world of speech signal processing. Discover the essential techniques that enable us to decode, manipulate, and reproduce the human communication with speech. Learn about signal and system theory necessary for speech processing in both human interaction and cutting-edge technological applications. This lecture series will equip you with the fundamental knowledge needed to unravel the intricacies of speech communication and embrace the possibilities it holds.
Lernziel	(1) Fundamental skills in speech signal processing (2) Understanding of speech acoustics like signal types, signal transformations, acoustic systems, signal and system theory (3) Application of the signal processing techniques in research and industrial products.
Unterrichtssprache	Englisch
Voraussetzungen	An interest in speech signal processing with computers is required.
Leistungsnachweis	Portfolio: (a) weekly assignments, 40% (b) end of term exam, 60%
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM523-520
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Instrumental techniques of phonetic research

ECTS	6
Lehrformen	Übung
Allg. Beschreibung	Since speech is a transient event, phoneticians regularly resort to the aid of technical devices in order to record, describe and analyse the production, the acoustics and the perception of speech sounds. Hence, in this module we look at the technical side of phonetic research and the students acquire and develop skills and techniques necessary for the successful deployment of such devices, ranging from sound recording equipment (especially recorders and microphones) to more specialized phonetic equipment (such as the laryngograph) to software solutions geared specifically towards the need of phoneticians (such as Praat or the R-package 'vowels').
Lernziel	Students know how to make high-quality audio recordings for phonetic research purposes. They can annotate sound files, make reliable measurements in them (formants, pitch, intensity, etc.) and produce meaningful visualizations (wave forms, spectra, spectrograms, etc.) with suitable software. They also understand how to read spectrograms so as to draw informed conclusions about the temporal and spectral characteristics of speech events. Moreover, students understand the most important key notions and concepts in automatizing measurements and in making them replicable (scripting).
Unterrichtssprache	Englisch
Voraussetzungen	Students are required to have attended an introductory module in phonetics at bachelor or master level.
Leistungsnachweis	During the semester students run guided analyses on spoken material both as part of the course but also as personal homework. In addition students are required to hand in a small-scale empiric study (7-10 pages) to be handed in a fortnight after the last meeting of the semester. Both their analyses during the semester and their final report form their portfolio and thus the basis for the evaluation of their performance.
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM523-526
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Experiments with speech

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	The media often reports that speech played backwards contains secret messages. Is that true? What does it sound like? Scientists showed that babies can extract information from the speech signal without even knowing anything about the linguistic system. In backward speech, such abilities may be lost. Other research showed that non-native speakers can be identified in speech even when it is played backwards. Why playing speech backwards? How is this done? In this seminar we will learn how to study speech communication using experimental techniques. Students will run their own experiments in which they will address a variety of questions, for example how we segment a continuous speech stream into words or syllables, how we identify different languages or different speakers or how we communicate in strong background noise. There are many fascinating things to discover about speech communication but most likely not that speech played backwards contains secret messages.
Lernziel	The course has the objectives to learn how to (a) design and execute experiments in speech; (b) formulate testable experimental hypotheses based on theoretical knowledge; (c) process and manipulate speech for experiments; (d) analyse quantitative data obtained from experiments; (e) interpret results; (f) compare and discuss the results with related research; (g) write up findings in a state-of-the-art experimental report.
Unterrichtssprache	Englisch
Voraussetzungen	The participation in «Fundamentals of Speech Sciences and Signal Processing» is highly recommended. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	Portfolio: (a) written assignments throughout term (20%), (b) oral presentation in class (20%), (c) written report (60%).
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM523-527
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Voice Analysis

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	<p>The human voice is a highly complex instrument that produces intricate communicative signals (vocalising). Vocalising involves approximately 200 muscles working together within the vocal apparatus. Understanding how these signals are produced requires knowledge of both the anatomy and physiology of the vocal tract and larynx, as well as the role of articulatory muscles. In this course, you will explore various methods used to study voice production, including laryngography and laryngoscopy (examining vocal fold movement), electromagnetic articulography and ultrasound (tracking articulator movements), pharyngometry (analyzing vocal tract dimensions), myography (measuring muscle activity during vocalization), and respiratory tracing (monitoring breathing patterns while speaking). You will also examine how voice production relates to the acoustic signal and the communicative information it conveys and we will look at some use cases such as voice recognition. All these methods are available through the Linguistic Research Infrastructure (LiRI), with which we will collaborate closely.</p>
Lernziel	<p>Main objectives of this cross-disciplinary seminar are to understand (1) methods for measuring voice production (2) how different communicative information is encoded in voice (3) how the knowledge about information in voice can be applied in voice technology or forensic voice analysis, for example.</p>
Unterrichtssprache	Englisch
Voraussetzungen	<p>The participation in "Fundamentals of Speech Sciences and Signal Processing" and "Experiments with speech" is highly recommended.</p> <p>This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.</p>
Leistungsnachweis	<p>Portfolio: (a) written assignments throughout the term (20%), (b) oral presentation (20%) and (c) written report (60%).</p>
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMBIO344
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 344 Development of the Nervous System

ECTS	3
Lehrformen	Vorlesung, Wiederholungsprüfung
Allg. Beschreibung	The lecture will cover molecular and cellular processes underlying the development of the nervous system in health and disease. We will discuss different aspects of neural circuit formation, starting with neurogenesis, differentiation, cell migration, and cell death. A major focus will be on neural circuit formation (including axon growth and guidance, synapse formation and homeostasis). The importance of these processes in the context of developmental diseases will be discussed.
Lernziel	On successful completion of the module the student should be able to <ul style="list-style-type: none">- relate structure and function of the nervous system to its development- apply principles of molecular, cellular, and developmental biology to the development of the nervous system- identify key steps in development underlying neurological syndromes and diseases Key skills On successful completion of the module the student should be able to <ul style="list-style-type: none">- interpret and critically evaluate original research reports- apply knowledge and relate experimental approaches from molecular, cellular and developmental biology to the developing nervous system
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic knowledge in neurobiology is required, for instance successful completion of BIO143 or equivalent lecture
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMINI401
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

INI 401 Introduction to Neuroinformatics

ECTS	6
Lehrformen	Übung, Vorlesung
Allg. Beschreibung	The course provides an introduction to the functional properties of neurons. Particularly the description of membrane electrical properties (action potentials, channels), neuronal anatomy, synaptic structures, and neuronal networks. Simple models of computation, learning, and behavior will be explained. Some artificial systems (robot, chip) are presented.

This course considers the structure and function of biological neural networks at different levels. The function of neural networks lies fundamentally in their wiring and in the electro-chemical properties of nerve cell membranes. Thus, the biological structure of the nerve cell needs to be understood if biologically-realistic models are to be constructed. These simpler models are used to estimate the electrical current flow through dendritic cables and explore how a more complex geometry of neurons influences this current flow. The active properties of nerves are studied to understand both sensory transduction and the generation and transmission of nerve impulses along axons. The concept of local neuronal circuits arises in the context of the rules governing the formation of nerve connections and topographic projections within the nervous system. Communication between neurons in the network can be thought of as information flow across synapses, which can be modified by experience. We need an understanding of the action of inhibitory and excitatory neurotransmitters and neuromodulators, so that the dynamics and logic of synapses can be interpreted. Finally, the neural architectures of feedforward and recurrent networks will be discussed in the context of co-ordination, control, and integration of sensory and motor information in neural networks.

Lernziel	
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	07SMINI435
Modulgruppe	Language Processing within Seconds
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

INI 435 Neural Systems

ECTS	6
Lehrformen	Übung, Vorlesung
Allg. Beschreibung	Neural Systems 2026 links biophysical neuron models to computation and behavior. It covers action potentials and dynamical systems, population and neural-mass models, memory and associative networks, birdsong and language learning, predictive coding, Bayesian inference and information theory, dimensionality reduction, intrinsic motivation, and neuroeconomic decision making.

The course develops a multi-scale view of neural systems from membrane biophysics to cognition and decision making. It begins with ionic concentration gradients, Nernst potentials, and the membrane equivalent circuit, leading to conductance-based Hodgkin–Huxley dynamics and numerical simulation (Euler, Runge–Kutta). Reduced neuron models are derived and analyzed using dynamical-systems tools: phase portraits, fixed points, stability, basins of attraction, bistability, and bifurcations. Two-dimensional reductions introduce nullclines, limit cycles, and transitions to periodic spiking through saddle-node, SNIC, and Hopf bifurcations, explaining type I/type II excitability, integrator vs resonator behavior, resonance, rebound and inhibition-induced spiking, depolarization block, and the impact of noise near criticality. The course then bridges to population descriptions via density and mean-field ideas, neural mass models, and Wilson–Cowan excitatory–inhibitory circuits, including hysteresis and oscillations, and motivates large-scale brain simulations. Computational themes include synaptic potentials, firing-rate nonlinearities, integrate-and-fire and rate-based network models, and neural coding with tuning curves. Memory is covered through classic experimental findings (free recall scaling laws, forgetting, recognition capacity, clinical deficits) and computational accounts of associative retrieval and attractor-like network ideas (Hopfield-type networks). A major systems module uses birdsong as a model for speech learning: template formation, the role of auditory feedback and social context, performance-error measurement (including optimal-transport style matching), and the organization of the song system (HVC–RA motor pathway and AFP basal-ganglia loop with LMAN/Area X). Key experiments (population recordings aligned to song, lesions, cooling, stimulation, antidromic identification) motivate circuit functions such as timing sequences

Lernziel	<ul style="list-style-type: none"> - Explain ionic equilibrium potentials, membrane equivalent circuits, and conductance-based spiking (Hodgkin–Huxley) - Simulate neural dynamics with numerical schemes (e.g., Euler and Runge–Kutta) and interpret refractoriness, rebound spiking, and noise effects - Reduce high-dimensional neuron models to 1D/2D systems and analyze phase portraits, nullclines, fixed points, basins of attraction, and bistability - Classify neuronal excitability and oscillatory regimes via bifurcations (saddle-node, SNIC, super/subcritical Hopf) and relate them to type I/II neurons, integrators/resonators, and threshold manifolds - Connect single-neuron dynamics to population descriptions (Fokker–Planck intuition, mean-field and neural mass models) and analyze Wilson–Cowan excitatory–inhibitory circuits, hysteresis, and limit cycles
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Unterrichtssprache	- Describe synaptic potentials, rate nonlinearities, integrate-and-fire models, and rate-based network equations - Interpret classic behavioral memory phenomena (free recall, forgetting curves, recognition capacity, amnesia) and relate them to computational accounts Understand associative memory and attractor network ideas (Hopfield-type networks) and their English
Voraussetzungen	Before taking this course, students are encouraged to gain familiarity with the topic by taking Introduction to Neuroinformatics (227-1037-00L) that covers less mathematical depth than Neural Systems. Another suitable preparatory course is Bioelectronics and Biosensors (227-0393-10L) that teaches students about signals and measurements at bioelectronic interfaces.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	03SM22BI0010
Modulgruppe	Language in the Future
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Social Computing (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	<p>Social computing studies the intersection of social behavior and computing systems. This intersection is not static: social behavior affects how computing systems are designed and computing systems affect how humans interact. Traditionally, social computing was more concerned with the first direction, how social norms and individual behavior affect the growth, success, and usage of online platforms. In recent years however, it is increasingly recognized that online platforms affect how people perceive the world, interact with each other, and ultimately how societal norms develop. Today, online platforms affect people's daily lives in essentially all domains: in healthcare, the labor market, social and family lives, education, information access, etc, and thus have a growing social, economical, and political impact.</p> <p>Regulatory action tries to react to changes in technology (GDPR, online discrimination law, competition law, etc) but as argued in this course, still much power and social responsibility remains in the hands of online platform providers.</p>
Lernziel	<p>Studying the ecosystem of online platforms and their users poses a multitude of challenges, given their complexity and how quickly they evolve. Understanding them requires the combination of technical skills (platform design, digital trace data collection, software tools), social science knowledge (from political science, social science, economics, law), and research design knowledge.</p> <p>Throughout the semester we will discuss the evolution of online platforms and smart phone apps, their use, structure, and purpose in society. We will learn about the underlying data and algorithmic eco- systems. The students will learn to scrape digital trace data and use this data to answer societally relevant research questions.</p> <p>By the end of the course students will be able to a) summarize the most important papers addressing societal problems from different domains related to online platforms, b) design an empirical research project bringing together research questions and technical/societal background, and c) identify and critically discuss ethical and bias-related issues with their research design.</p>
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM523-112
Modulgruppe	Language in the Future
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Language Technology with Multilingual and Multimodal Data

ECTS	6
Lehrformen	Tutorat, Vorlesung mit integrierter Übung
Allg. Beschreibung	This module introduces key methods for multilingual and multimodal modeling in language technology. It examines longstanding tasks such as transforming text between languages in machine translation and converting audio recordings into text in speech recognition, and shows how multilingual and multimodal approaches can be beneficial even for tasks confined to a single language or modality, particularly in low-resource settings. The module discusses methods developed for mapping between languages and modalities and explains how shared internal representations support cross-lingual and cross-modal transfer. In addition, students analyze the practical consequences of these approaches, including positive transfer effects as well as undesirable biases that can arise from multilingual or multimodal systems.
Lernziel	Students can: <ol style="list-style-type: none">1. build multilingual and multimodal language technology applications.2. explain common methods for mapping between languages and modalities, such as those used in machine translation and related tasks.3. describe how shared internal representations enable cross-lingual and cross-modal transfer.4. analyze benefits and limitations of multilingual and multimodal modeling, including transfer effects and biases.
Unterrichtssprache	Deutsch und/oder Englisch
Voraussetzungen	Successfully completed modules "Machine Learning for Language Technology" and "Programming in Language Technology" or equivalent knowledge.
Leistungsnachweis	Portfolio
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	10SMSTS-602
Modulgruppe	Language in the Future
Modultyp	Wahlpflicht
Organisation	School for Transdisciplinary Studies

Open Source Intelligence (OSINT)

ECTS	3
Lehrformen	Seminar
Allg. Beschreibung	OSINT, short for Open-Source Intelligence, enables you to gather crucial information from a variety of publicly available sources, including social media, news articles, government websites, and much more. The capacity to gather, examine, and validate open-source information has never been more crucial - particularly as powerful LLMs both amplify the speed of data processing and raise new challenges around disinformation that must be rigorously detected and mitigated. Throughout this course, students will learn how to (a) use OSINT tools and techniques to gather information, (b) apply Operational Security measures to minimize their own digital footprint, (c) adopt best practices to document, assess, and effectively report findings, and (d) recognize and navigate legal and ethical considerations to ensure proper conduct within the permitted scope.
Lernziel	<ol style="list-style-type: none">1. Understanding the concept and scope of OSINT;2. Developing awareness of ethical and legal considerations when using OSINT methods;3. Understanding the limitations and challenges of OSINT;4. Using OSINT techniques on a practical project.
Unterrichtssprache	Englisch
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	10SMSTS-603
Modulgruppe	Language in the Future
Modultyp	Wahlpflicht
Organisation	School for Transdisciplinary Studies

Advanced Text Analysis Using Natural Language Processing

ECTS	1
Lehrformen	Seminar
Allg. Beschreibung	<p>This online course is designed for beginners who are curious about how to analyze and make sense of large amounts of text data, especially in the field of health research. No previous knowledge in text analysis is required-just an interest in learning new ways to work with data.</p> <p>In this course, students will explore how to uncover hidden topics in text in data-driven fashion (like finding themes in health articles) using a technique called topic modeling. They will also learn how to create simple tools (called classifiers) that can automatically sort and categorize text into different groups. The course will cover some basic ideas from natural language processing (NLP), which is the engine behind e.g. chatbots and search engines. Throughout the course, students will work with real examples from health research, but are also welcome to bring their own data if they have it.</p>
Lernziel	<p>By the end of the course, participants will have a basic understanding of language models, how they can be leveraged to mine public opinion in the media, and what to consider for the responsible use of language models.</p> <p>Specifically, participants will:</p> <ol style="list-style-type: none">1. Discuss the potential and risks of using language models for digital health research2. Evaluate the suitability of different language models for a particular opinion mining task using freely available AI resources3. Develop competencies for responsible use and critical evaluation of language AI
Unterrichtssprache	English
Voraussetzungen	<p>This course requires students to have basic Python skills, including familiarity with the 'pandas' and 'numpy' libraries for datamanipulation. They will also need to set up and be familiar with Jupyter Notebook (https://jupyter.org/) prior to the course.</p> <p>Please note that there will be no introductory session on Python.</p>
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	10SMSTS-604
Modulgruppe	Language in the Future
Modultyp	Wahlpflicht
Organisation	School for Transdisciplinary Studies

ChatGPT and Beyond: Interdisciplinary Approaches to AI Literacy

ECTS	2
Lehrformen	Seminar
Allg. Beschreibung	This course addresses the rapidly evolving field of generative AI and its applications. Students will learn the essential principles of how generative AI models function and explore the opportunities of various tools and techniques. It also encourages critical discussion of the technology's limitations-legal, technical, and ethical-alongside potential dangers such as bias and information loss. Through examples from different disciplines, students will gain a purposeful understanding of generative AI, emphasizing transparency and responsible use. The course features lecturers from various UZH departments, each providing unique insights and use cases from their fields. By the end of the course, students will have acquired the knowledge and skills to critically and effectively apply AI tools, preparing them to navigate and innovate responsibly in the complex landscape of generative AI.
Lernziel	After the course, students will be able to <ol style="list-style-type: none">1. Understand the fundamental principles of how generative AI tools work.2. Recognize the possibilities and chances offered by generative AI tools in various contexts.3. Identify and critically assess the limitations and dangers, including legal, technical, cost, and ethical considerations, of using generative AI.4. Successfully and responsibly apply generative AI tools in their studies.
Unterrichtssprache	English
Voraussetzungen	The course is not suitable for Bachelor students in their first semester.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	03SM22AINF05
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Foundations of Computing I (L+E) (Formale Grundlagen der Informatik I)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	This course introduces mathematical tools used in computer science (from database management to artificial intelligence, machine learning, data analysis and visualization, cryptography and security, computer graphics, computer vision, and image processing). In particular, the course will teach the following topics: propositional logic, digital logic circuits, induction and recursion, convolution, relations, modular arithmetic with application to cryptography, graphs, and trees.
Lernziel	Students will learn propositional logic, digital logic circuits, induction and recursion, convolution, relations, modular arithmetic with application to cryptography, graphs, and trees.
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	03SM22BI0001
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Foundations of Computing II (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Required second-year course covering topics from discrete math and formal methods building the foundations of computing. The material of this course is pervasive in the areas of algorithms, data structures and programming but appears virtually in all areas of computer science as well. The course will cover topics such as, but not limited to, proof methods, formal languages, deterministic and nondeterministic finite automata, grammars and pushdown automata, Turing machines, computability, decidability and complexity, P and NP, NP-completeness.
Lernziel	The goal of the course is to familiarize the student with formal methods of computing and their value for computer science and related disciplines, and to provide basic training in applying formal methods to many different kinds of problems. Students should learn the fundamental limits of computation and extend their knowledge on formal languages as well as on formal programming models. Principles of interference, deduction, induction and contradiction should regularly be applied to demonstrate the formal correctness of models and limits.
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22MI0005
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Foundations of Data Science (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Introduction to data science and different paradigms of machine learning; Linear prediction, Regression; Maximum Likelihood; Regularization, Generalization, Cross Validation; Optimization; Logistic Regression; Generative Models for Classification, Gaussian Discriminative Analysis, Naïve Bayes; Support Vector Machines; Kernel Methods; Neural Networks, Backpropagation; Clustering; Dimensionality Reduction, PCA.
Lernziel	This course introduces supervised and unsupervised learning. Students will learn the algorithms that underpin popular machine learning techniques. They will also develop an understanding of the theoretical relationships between these algorithms. The practicals will concern the implementation of machine learning algorithms and applications of machine learning.
Unterrichtssprache	English
Voraussetzungen	Introductory courses on continuous mathematics, linear algebra, probability theory, such as: WWF courses Mathematics I, Mathematics II, and Statistics.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM272-015
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Linguistische Datenwissenschaft

ECTS	6
Lehrformen	Übung
Allg. Beschreibung	Die Veranstaltung vermittelt praktische Kenntnisse im Bearbeiten, Speichern, Visualisieren und Analysieren sprachlicher Daten.
Lernziel	Praktische Kenntnis der wichtigsten datenwissenschaftlichen Methoden der Linguistik
Unterrichtssprache	Deutsch oder Englisch
Voraussetzungen	—
Leistungsnachweis	Portfolio (50% schriftliche Übungen und 50% schriftliche Arbeit)
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM272-016
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Statistik für Linguistinnen und Linguisten

ECTS	3
Lehrformen	Tutorat, Vorlesung mit integrierter Übung
Allg. Beschreibung	In der Veranstaltung werden in die wichtigsten Grundkonzepte und Verfahren der deskriptiven, explorativen und inferentiellen Statistik der modernen Linguistik eingeführt.
Lernziel	Fähigkeit, die wichtigsten statistischen Methoden und Resultate zu verstehen, die in wissenschaftlichen Texten der Linguistik verwendet werden
Unterrichtssprache	Deutsch oder Englisch
Voraussetzungen	Kenntnisse der Stochastik und Wahrscheinlichkeitstheorie auf Maturitätsniveau
Leistungsnachweis	Portfolio (40% 2 schriftliche Übungen, 60% dokumentierte praktische Arbeit)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM523-003
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Mathematical Foundations for Language Technology 1

ECTS	6
Lehrformen	Tutorat, Vorlesung mit integrierter Übung
Allg. Beschreibung	This module reviews and strengthens the mathematical foundations required for understanding and developing methods in language technology. It covers essential concepts from logic, set theory, probability theory, descriptive statistics, combinatorics, analysis, linear algebra, and information theory, and highlights how these areas underpin core techniques in computational linguistics. The module introduces practical exercises to build mathematical intuition and to support the implementation and analysis of language technology systems. Students also work with computational tools to explore, analyze, and visualize data.
Lernziel	Students can: <ol style="list-style-type: none">1. explain language technology methods using mathematical concepts from the covered areas.2. use mathematical tools to design solutions to selected problems in language technology.3. analyze and visualize data using computational methods.
Unterrichtssprache	Englisch
Voraussetzungen	None.
Leistungsnachweis	Portfolio: 75% final exam, 25% mid-term exam
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM523-005
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Programming in Language Technology 2

ECTS	6
Lehrformen	Tutorat, Vorlesung mit integrierter Übung
Allg. Beschreibung	This module deepens programming skills in Python with a focus on developing software for language technology applications. It emphasizes writing clear and maintainable code, applying modern programming techniques to domain-specific tasks, and using essential practices in code management such as version control, testing, debugging, and systematic code review. Integrated exercises support the refinement and evaluation of software in natural language processing contexts.
Lernziel	Students can: <ol style="list-style-type: none">1. apply modern programming knowledge and skills to solve tasks in language technology.2. review, debug, and improve human- and machine-written code in language technology applications.3. use essential code management practices, including version control and testing, to support systematic software development.
Unterrichtssprache	Deutsch und/oder Englisch
Voraussetzungen	Successfully completed module "Programming in Language Technology 1" or equivalent knowledge. Knowledge to the extent of "Introduction to Language Technology".
Leistungsnachweis	Portfolio: 75% final exam, 25% exercises
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM523-529
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Intermediate Methods and Programming in Digital Linguistics

ECTS	6
Lehrformen	Tutorat, Vorlesung mit integrierter Übung
Allg. Beschreibung	<p>This course is designed to refresh and to deepen programming skills in Unix and Python. We teach basic operators and functions, the handling of lists and dictionaries as well as the basics of object-oriented programming. It is particularly important that the students acquire the ability to prepare text and speech data for further processing.</p> <p>Through practical tasks and exercises, we train the algorithmic and programming skills of the participants.</p>
Lernziel	<p>Students will be able to use Unix-based systems and Unix language processing tools efficiently. Students will know the basic data types, control structures and functions of Python. Students will be able to design problem solutions and to implement them in Python. Students will know how to use basic tools and programming libraries for corpus linguistics.</p>
Unterrichtssprache	Englisch
Voraussetzungen	<p>Successful completion of the introductory course "Language Data Processing" of the Master Linguistics</p> <p>This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.</p>
Leistungsnachweis	Portfolio
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM523-530
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Eye Tracking and NLP

ECTS	6
Lehrformen	Übung
Allg. Beschreibung	<p>This course introduces a growing research area that combines eyetracking during reading with natural language processing (NLP). Students will learn how eye movements in reading can be leveraged for enhancing and interpreting language models, and how eye movements can be exploited for a range of new human-centered applications. The course covers the following topics: (i) fundamentals of eye movements in reading, (ii) experimental methodologies and available data sets, (iii) generative models of eye movements, iv) leveraging eye movement data for NLP and v) human-centered applications.</p>
Lernziel	Students will acquire theoretical knowledge and develop practical skills in the topics covered by this course.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	<p>Python programming skills at least on the level of the Module «Programmiertechniken in der Computerlinguistik 2», and familiarity with foundational knowledge in machine learning and NLP. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.</p>
Leistungsnachweis	Portfolio (80% written exam und 20% theoretical and practical assignments)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO334
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 334 Practical Bioinformatics

ECTS	6
Lehrformen	Blockkurs
Allg. Beschreibung	Analysis of complex bioinformatic data using python and R
Lernziel	By the end of this course, students should be able to <ul style="list-style-type: none">- write simple python scripts that use basic and advanced data and control structures- perform straightforward data manipulations and statistical analyses in the language R- apply python and R to the analysis of large and complex sequence and functional genomic data sets
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic studies completed
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMBIO610
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

BIO 610 Introduction to Machine Learning for Genomics

ECTS	1
Lehrformen	Sonstiges
Allg. Beschreibung	<p>This course is a hands-on introduction to machine learning with Python for biologists with focus on genomics and evolution. It focuses on analyzing gene expression and experimental data. You will start with the basics, like preparing data and making graphs, then move on to practical tasks. Workflow of the Functional Genomics Center Zurich is used for the hands-on of next-generation sequencing data. We will also use Large Language Models (LLMs) as a powerful helper to make programming and data analysis easier.</p>
Lernziel	<p>By the end of the module the students should be able to</p> <ul style="list-style-type: none">- Understand concepts of NGS technologies- Understand fundamentals of data analysis- Design a research experiment and the data analysis involving biologically relevant issues affecting populations of plants or animals- Run machine learning analysis process- Understand basic bioinformatics of large datasets for practical use in genetic analyses
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Basic studies completed
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (unregelmässig)



Modulkürzel	07SMMAT183
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

MAT 183 Stochastik für die Naturwissenschaften

ECTS	6
Lehrformen	Übung, Vorlesung, Wiederholungsprüfung
Allg. Beschreibung	Diese Vorlesung ist eine obligatorische Fortsetzung des Moduls "MAT182 Analysis für die Naturwissenschaften" aus dem Wintersemester. Es werden die wichtigsten Begriffe und Konzepte aus der Wahrscheinlichkeitsrechnung und Statistik eingeführt und ihre Anwendungen illustriert.
Lernziel	Grundlagen für weiterführende Vorlesungen werden bereitgestellt. Einfache statistische Probleme können von den StudentInnen selbständig gelöst werden. StudentInnen erkennen Grenzen der Statistik bei Entscheidungsproblemen.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMSTA120
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

STA 120 Introduction to Statistics

ECTS	5
Lehrformen	Übung, Vorlesung, Wiederholungsprüfung
Allg. Beschreibung	Point and interval estimation and related tests, multivariate Gaussian distribution in the linear framework including simple extensions, rank based approaches and a short introduction to Bayes theory. Use of the software R.
Lernziel	- solid knowledge in applied statistics. - a practical basic education in important basic and modern methods of statistics. - comprehensive capabilities of using the programming language R.
Unterrichtssprache	English
Voraussetzungen	- MAT 183 Stochastik für die Naturwissenschaften oder äquivalent UND - MAT 141 Lineare Algebra für die Naturwissenschaften oder äquivalent
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	07SMSTA121
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	Mathematisch-naturwissenschaftliche Fakultät

STA 121 Statistical Modeling

ECTS	5
Lehrformen	Praktikum, Übung, Vorlesung, Wiederholungsprüfung
Allg. Beschreibung	Multiple regression, logistic regression, multifactor experimental design, nonparametric smoothing, principal component analysis, bootstrap, survival data, using the programming language R
Lernziel	<ul style="list-style-type: none">- solid knowledge in applied statistics- a practical basic education in important basic and modern methods of statistics- comprehensive capabilities of using the programming language R
Unterrichtssprache	Englisch
Voraussetzungen	STA 120 Introduction to Statistics or basic knowledge in probability and statistics
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	10SMSTS-506
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	School for Transdisciplinary Studies

Get R_eady: Introduction to Data Analysis for Empirical Research

ECTS	1
Lehrformen	Seminar
Allg. Beschreibung	The course offers an introduction to data analysis in the transdisciplinary field of empirical research in the programming language R. The R system of statistical computing is openly available from https://www.r-project.org and provides a simple and flexible software environment for statistical analyses and graphics. Tailored to the application of empirical research the course covers basics of functions and data formats in R, as well as the essential steps of a data analysis including data manipulation, descriptive statistics, statistical tests and graphical representations. Reflections on research methodology and transdisciplinarity will take place and critical thinking will be enhanced.
Lernziel	Aims of the course - to equip participants with the essential tools to address their research questions in R, - participants are able to perform plausibility checks, descriptive analysis, statistical tests and visualization of their research data in R, - participants are able to critically engage with and reflect on methodological aspects of data analysis and presentation and can adapt contemporary examples for critical appraisal to their disciplinary background.
Unterrichtssprache	Englisch
Voraussetzungen	Participants should have basic knowledge in statistics and should be beginners with the software R.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	10SMSTS-508
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahlpflicht
Organisation	School for Transdisciplinary Studies

Get R_eady: Prognostic & Prediction Modeling in Research

ECTS	1
Lehrformen	Seminar
Allg. Beschreibung	<p>Prognostic models to predict future events have increasingly been used across different fields, e.g. in the medical sciences (clinical prediction models, personalized medicine, prognostic models), in legal data science (predictive analytics), political sciences (scientific prediction), or related.</p> <p>The derivation and validation of such models poses specific challenges, that require knowledge of distinct methodological aspects in order to develop models that are internally valid and can be generalized out-of-sample. This course covers traditional statistical as well as machine learning approaches for model development, sample size calculation, variable selection, methodological outcomes for the assessment of model performance, as well as model validation. The course encourages critical thinking regarding published prognostic models' validity across different fields of research.</p>
Lernziel	<p>Aims of the course</p> <ul style="list-style-type: none">- to equip participants with the essential tools to derive a prediction model,- to enable participants to apply and interpret suitable model diagnostics for different types of prediction models,- to empower participants to critically engage with and reflect on published prediction models
Unterrichtssprache	Englisch
Voraussetzungen	Participants should have basic knowledge in the programming language R, equivalent to completion of the course "Get R_eady: Introduction to Data Analysis for Empirical Research". Additionally they should be familiar with statistical methods including statistical modeling methodology for binary outcomes.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	06SM523-001
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahl
Organisation	Institut für Computerlinguistik

Introduction to Language Technology

ECTS	3
Lehrformen	Tutorat, Vorlesung mit integrierter Übung
Allg. Beschreibung	This module provides an introductory overview of computational linguistics and language technology. It covers central tasks such as text encoding, tokenization, morphological and syntactic processing, sequence tagging, and text classification. Students are introduced to language models, conversational systems, information retrieval, multilingual technologies, and speech and vision applications. The module integrates theoretical concepts with practical demonstrations and includes discussion of accessibility-oriented tools and responsible AI.
Lernziel	Students can: <ol style="list-style-type: none">1. explain core concepts, tasks, and methods in modern language technology.2. apply fundamental NLP techniques such as tokenization, tagging, and text classification.3. describe how language models, chatbots, information retrieval pipelines, multilingual models, and translation systems operate.4. outline principles of speech processing, multimodal approaches, and accessibility-oriented technologies.5. assess the capabilities and limitations of language technologies, including fairness and bias.
Unterrichtssprache	Englisch
Voraussetzungen	None.
Leistungsnachweis	Portfolio: 75% final exam, 25% exercises
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM523-002
Modulgruppe	Mathematical and Scripting Methods
Modultyp	Wahl
Organisation	Institut für Computerlinguistik

Programming in Language Technology 1

ECTS	6
Lehrformen	Tutorat, Vorlesung mit integrierter Übung
Allg. Beschreibung	This module introduces the fundamentals of command line interfaces and programming. It covers core programming constructs such as control structures, data types, and basic principles of object-oriented programming. Theoretical instruction is combined with hands-on exercises in natural language processing and data analysis. Practical work focuses on applying algorithmic approaches to problems typically encountered in computational linguistics.
Lernziel	Students can: <ol style="list-style-type: none">1. operate command line interfaces.2. use control structures and data types effectively.3. apply basic principles of object-oriented programming.4. conduct data analysis and natural language processing tasks.5. address real-world problems using algorithmic approaches.
Unterrichtssprache	Englisch
Voraussetzungen	None.
	Attending the module "Introduction to Language Technology" in the same semester is highly recommended.
Leistungsnachweis	Portfolio: 75% final exam, 25% exercises
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM274-600
Modulgruppe	Research Related Competences
Modultyp	Pflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Research Related Competences

ECTS	30
Lehrformen	Selbststudium
Allg. Beschreibung	The Research Related Competences module provides students with knowledge and practical experience across key phases of designing and carrying out empirical research projects, ensuring adherence to the highest standards of research practice. This module is closely integrated with the Master's thesis module, where students will further advance and apply their competences in executing and finalizing their research project. Each performance element within this module can be supervised by at least one thesis supervisor. Supervision takes place in consultation hours and/or colloquia.
Lernziel	Students will develop competencies in the following areas: <ul style="list-style-type: none"> 1. Literature review 2. Study preregistration 3. Data management planning 4. Ethics approval 5. Pilot study - design and execution 6. Data collection and processing 7. Interdisciplinary project progress reporting 8. Interdisciplinary discussions on language evolution
Unterrichtssprache	Englisch
Voraussetzungen	Students must submit a work plan to the supervisors which includes a timetable for the submission of evidence for each performance element. This plan must be signed by all supervisors. This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	Portfolio: 1. Literature review (part I): written work; 2. Study preregistration: documented practical work; 3. Data management plan: documented practical work; 4. Ethical approval: documented practical work; 5. Pilot study - design and execution: documented practical work; 6. Data collection and processing (part I): documented practical work; 7. Interdisciplinary project progress reports: oral presentation; 8. Interdisciplinary discussions on language evolution: oral presentation. In order to pass the module, 7 out of the 8 performance elements of the portfolio must be successfully completed.
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	keine Wiederholungsmöglichkeit
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	06SM274-MA
Modultyp	Pflicht
Organisation	Institute for the Interdisciplinary Study of Language Evolution

Master's Thesis

ECTS	30
Lehrformen	Master Paper / MA-Arbeit
Allg. Beschreibung	
Lernziel	
Unterrichtssprache	Englisch
Voraussetzungen	This module is open only to Master's students. It may not be booked by Bachelor's students as a pre-Master's module.
Leistungsnachweis	written paper
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (jedes Semester)