



Computational Linguistics and Language Technology

Master Major 90

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-7523i01	Scientific Specialization
06M-7523i02	Core Modules of Computational Linguistics and Language Technology
06M-7523i03	Computer Science
06M-7523i04	Computational Linguistics and Language Technology in Practice
06M-7523w01	Other Curricular Modules
	Abschlussarbeit

Übersicht über die Module in den Modulgruppen

06M-7523i01

Scientific Specialization

Modultyp ECTS

Diese Modulgruppe enthält ausschliesslich Wahlmodule.
Informieren Sie sich im Vorlesungsverzeichnis über das aktuelle Angebot.

06M-7523i02

Core Modules of Computational Linguistics and Language Technology

Modultyp ECTS

06SM523-501	Advanced Techniques of Machine Translation	Wahlpflicht	6
06SM523-505	Machine Learning for Natural Language Processing 1	Wahlpflicht	6
06SM523-506	Machine Learning for Natural Language Processing 2	Wahlpflicht	6
06SM523-519	Fundamentals of speech sciences and signal processing	Wahlpflicht	6
06SM523-520	Instrumental techniques of phonetic research	Wahlpflicht	6
06SM523-530	Eye Tracking and NLP	Wahlpflicht	6
06SM523-532	Artificial Intelligence for Language Accessibility	Wahlpflicht	6
06SM523-533	Advanced Machine Learning	Wahlpflicht	6
06SM523-534	Introduction to Forensic Speech Sciences	Wahlpflicht	6
06SM523-s15	[Excursion]	Wahl	3

06M-7523i03

Computer Science

Modultyp ECTS

03SM22BI0001	Foundations of Computing II (L+E)	Wahlpflicht	6
03SM22BI0003	Numerical Methods in Informatics (L+E)	Wahlpflicht	6
03SM22BI0004	Software Construction (L+E) (Softwarekonstruktion)	Wahlpflicht	6
03SM22BI0005	Wirtschaftsinformatik II (V+Ü) (Business Informatics II)	Wahlpflicht	6
03SM22BI0006	Computer Networks and Distributed Systems (L+E) (Kommunikationsnetze und	Wahlpflicht	6
03SM22BMI003	Requirements Engineering I (L+E)	Wahlpflicht	3
03SM22MI0001	Information Management (L+E)	Wahlpflicht	6
03SM22MI0002	Fundamentals of Software Systems (L+E)	Wahlpflicht	6
03SM22MI0003	Fundamentals of Human-Centered Computing	Wahlpflicht	6
03SM22MI0004	Advanced Topics in Artificial Intelligence (AI) (L+E)	Wahlpflicht	6
03SM22MI0005	Foundations of Data Science (L+E)	Wahlpflicht	6
03SM22MI0010	Protocols for Multi-media Communications (PMMK) (L+E)	Wahlpflicht	6
03SM22MI0011	Object-Oriented Software Development (V) (Objektorientierte	Wahlpflicht	3
03SM22MI0012	Enterprise IT-Architectures (L+E)	Wahlpflicht	3
03SM22MI0014	Human Aspects of Software Engineering (L+E)	Wahlpflicht	6
03SM22MI0019	Network Science (L+E)	Wahlpflicht	6
03SM22MI0023	Randomized Algorithms (L)	Wahlpflicht	6
03SM22MI0043	Reinforcement Learning (L+E)	Wahlpflicht	6
03SMDINF2039	Vision Algorithms for Mobile Robotics (L+E)	Wahlpflicht	6

06M-7523i04

Computational Linguistics and Language Technology in Practice

Modultyp ECTS

06SM523-510	Practical Training In-House	Wahlpflicht	6
06SM523-511	Practical Training Off-Site	Wahlpflicht	6
06SM523-512	Programming Project 1	Wahlpflicht	6
06SM523-513	Student Teaching Assistant 1	Wahlpflicht	6



06SM523-516	Student Teaching Assistant 2	Wahlpflicht	6
06SM523-517	Programming Project 2	Wahlpflicht	6
06M-7523w01	Other Curricular Modules	Modultyp	ECTS
06SM523-524	Speech perception and the brain	Wahlpflicht	6
06SM523-526	Experiments with speech	Wahlpflicht	6
06SM523-527	Voice Analysis	Wahlpflicht	6
06SM523-531	Our voice: Between linguistic and idiosyncratic information	Wahlpflicht	6
10SMSTS-106	UZH Innovathon: The Digitalization of Mobility	Wahl	3
10SMSTS-201	Interdisciplinary Introduction to Machine Learning - Theory	Wahl	3
10SMSTS-202	Teamwork on Digital Transformation Challenges I	Wahl	3
10SMSTS-204	Digital Transformation - a Scientific Overview	Wahl	3
10SMSTS-500	Start! Teaching Essentials	Wahl	1
10SMSTS-506	Get R_eady: Introduction to Data Analysis for Empirical Research	Wahl	1
10SMSTS-508	Get R_eady: Prognostic & Prediction Modeling in Research	Wahl	1
10SMSTS-510	Raumanalysen interdisziplinär: GIS als digitale Methode	Wahl	3
10SMSTS-602	Open Source Intelligence (OSINT)	Wahl	3
	Abschlussarbeit	Modultyp	ECTS
06SM523-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	06SM523-501
Modulgruppe	Core Modules of Computational Linguistics and Language Technology
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Advanced Techniques of Machine Translation

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	In this course we present and experience the latest research in Machine Translation. Topics include building and evaluating Machine Translation systems, and integrating the systems into various application scenarios. We take a broad perspective and look at Machine Translation for different language situations (written, spoken, and signed language). And we take a deep perspective by studying the underlying linguistic knowledge sources and statistical techniques in detail.
Lernziel	The students (1) will be acquainted with the latest research and developments in Machine Translation (2) will learn how to build Machine Translation systems with state-of-the-art performance (3) will learn how to perform Machine Translation experiments and publish the results
Unterrichtssprache	Englisch
Voraussetzungen	Basic knowledge in Machine Translation and Machine Learning.
Leistungsnachweis	Portfolio (75% final exam und 25% exercises)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM523-505
Modulgruppe	Core Modules of Computational Linguistics and Language Technology
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Machine Learning for Natural Language Processing 1

ECTS	6
Lehrformen	Tutorat, Vorlesung
Allg. Beschreibung	Modern Natural Language Processing (NLP) requires a high level of expertise in neural machine learning techniques. This course first covers the basic supervised and unsupervised methods used in NLP. The second part focuses on transfer learning and prediction of linguistic structures. Participants will gain theoretical and practical experience in this course.
Lernziel	Students know about relevant machine learning techniques for NLP. They understand advanced neural methods for transfer learning and linguistic structure prediction. They gain practical experience in applying machine learning to NLP problems.
Unterrichtssprache	Englisch
Voraussetzungen	Good programming skills in Python and basic knowledge in statistics and probability theory.
Leistungsnachweis	Portfolio (75% written exam and 25% proof of academic achievements in self-study)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM523-506
Modulgruppe	Core Modules of Computational Linguistics and Language Technology
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Machine Learning for Natural Language Processing 2

ECTS	6
Lehrformen	Tutorat, Vorlesung
Allg. Beschreibung	This course focuses on current neural machine learning (ML) methods that achieve state-of-the-art performance in Natural Language Processing (NLP) tasks. Participants study and present current research articles from the NLP literature. As a practical preparation for a modern empirical master thesis, they learn how to plan, conduct and evaluate ML-based NLP experiments and how to describe their approach and results in a scientific paper.
Lernziel	Students know the current state of machine learning methods for various NLP tasks. They know how to conduct machine learning-based empirical research in computational linguistics and how to present it in the scientific format of a workshop paper.
Unterrichtssprache	Englisch
Voraussetzungen	Successfully completed module «Machine Learning for Natural Language Processing I».
Leistungsnachweis	Portfolio: 50% Referat/Diskussionsbeiträge, 50% schriftliche Arbeit
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM523-519
Modulgruppe	Core Modules of Computational Linguistics and Language Technology
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	Core Modules of Computational Linguistics and Language Technology
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	06SM523-530
Modulgruppe	Core Modules of Computational Linguistics and Language Technology
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Eye Tracking and NLP

ECTS	6
Lehrformen	Übung
Allg. Beschreibung	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.
Lernziel	Students will acquire theoretical knowledge and develop practical skills in the topics covered by this course.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	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.
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	06SM523-532
Modulgruppe	Core Modules of Computational Linguistics and Language Technology
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Artificial Intelligence for Language Accessibility

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Blind persons and persons with visual impairments, deaf persons and persons with hearing impairments, persons with cognitive impairments, motor impairments, and persons with speech and language disorders face many barriers in their everyday lives, often related to language. This course provides an overview of common barriers and introduces artificial intelligence approaches developed to reduce some of these barriers. Specifically, the course deals with tasks such as sign language recognition, translation, and production; intralingual subtitling; audio description; diagnostics of speech and language disorders; automatic text simplification; and speech recognition and synthesis as part of Augmentative and Alternative Communication (AAC) and Ambient Assisted Living (AAL). A focus is on research approaches; transversal topics are those of multimodality and ethics. Students will gain hands-on practice applying some of the approaches as part of the exercises accompanying the course. This course is preceded by a "Digital Accessibility" course on Bachelor's level.
Lernziel	Students (1) are aware of different target groups in the context of accessibility; (2) are aware of language barriers that these target groups face; (2) know about research approaches from the area of artificial intelligence towards reducing some of these barriers; (3) know how to apply a selection of these approaches.
Unterrichtssprache	Englisch
Voraussetzungen	Knowledge to the extent of the courses "Einführung in die Computerlinguistik 1" and "Programmiertechniken der Computerlinguistik 1"; familiarity with model training
Leistungsnachweis	Written exam
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM523-533
Modulgruppe	Core Modules of Computational Linguistics and Language Technology
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Advanced Machine Learning

ECTS	6
Lehrformen	Tutorat, Vorlesung mit integrierter Übung
Allg. Beschreibung	This course examines advanced methods in supervised and unsupervised machine learning, with a focus on deep learning architectures. Topics include state-of-the-art models such as Transformers, Graph Neural Networks, Diffusion Models, and State Space Models, with attention to both their theoretical principles and practical implementation.
Lernziel	Students will acquire theoretical knowledge of state-of-the-art machine learning techniques and the practical skills to apply these methods to different kinds of problem settings.
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	Solid knowledge of supervised and unsupervised machine learning, probability theory, linear algebra, multivariate calculus as well as fluent Python programming skills are required.
Leistungsnachweis	Portfolio (20% practical assignments, 80% written exam)
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Frühjahrssemester)



Modulkürzel	06SM523-534
Modulgruppe	Core Modules of Computational Linguistics and Language Technology
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Introduction to Forensic Speech Sciences

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Forensic Speech Science is a multidisciplinary field that applies various aspects of phonetics, linguistics, signal processing, and automatic speaker recognition for legal and investigative purposes. This module aims to introduce the goals, tasks (e.g. transcription, speaker comparison, disambiguation of disputed utterances) and practices of forensic speech and audio analysis. This module blends frontal teaching and hands-on sessions.
Lernziel	By the end of this module, students will have achieved the following learning objectives: - A fundamental understanding of factors affecting the perception, analysis, and transcription of speech signals within investigative settings. - Develop familiarity with diverse methods for transcribing forensic audio materials, including using state-of-the-art automatic speech recognition systems. - Gain familiarity with multiple approaches to forensic voice comparison, including auditory assessment, acoustic-phonetic analysis, and automatic techniques. - Showcase their abilities through practical demonstrations in voice comparison and the transcription of forensic recordings
Unterrichtssprache	Englisch
Voraussetzungen	The participation to modules on Phonetics and Phonology is highly recommended.
Leistungsnachweis	Portfolio: 50% assignments, 50% final course exam
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM523-s15
Modulgruppe	Core Modules of Computational Linguistics and Language Technology
Modultyp	Wahl
Organisation	Institut für Computerlinguistik

[Excursion]

ECTS	3
Lehrformen	Exkursion
Allg. Beschreibung	Excursions, similar to practical training off-site, offer the opportunity to gain insight into the daily work of computational linguists. In contrast to these, however, the emphasis is not on concrete work in a company, but on the ability to recognize and assess the problems and methods of a field of application of computational linguistics in direct contact as accurately as possible. This provides insights into problem areas, allows one to measure one's own specific interests and, if necessary, to fix future work areas and employers. The students prepare for the excursion by effectively researching and studying relevant literature. This module can be booked to credit the participation in excursions.
Lernziel	The students (1) gain insight into language technology companies and university or non-university research departments (2) get to know the theory and practice of computational linguistics in a concrete example (3) find or develop one's own specific interests (4) gain the ability to get insight into practical problems and methods through interviews with practitioners (5) get in contact with potential employers
Unterrichtssprache	siehe Vorlesungsverzeichnis
Voraussetzungen	This module can not be booked by the students themselves, the booking has to be authorized by the module coordinator. In order to credit the participation in an excursion, it is essential to contact to the module coordinator before the start of the excursion.
Leistungsnachweis	Nachweis von im Selbststudium erbrachten Studienleistungen
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	keine Wiederholungsmöglichkeit
Angebotsmuster	1-semesterig (einmalig)



Modulkürzel	03SM22BI0001
Modulgruppe	Computer Science
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	03SM22BI0003
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Numerical Methods in Informatics (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	The course presents the basic numerical and linear algebra techniques to solve mathematical problems that arise in computer science. The topics cover a wide range such as e.g.: basic concepts of scientific programming, solution of systems of linear equations and of nonlinear equations; interpolation and least-square approximation of data and functions; eigenvalues and eigenvectors computation; integration and differentiation and numerical optimization. The course consists of lectures, exercises and homework assignments.
Lernziel	By the end of the course, the students will be able to identify a suitable method to solve basics problems of scientific computing, understand the main implications of the method and implement it directly or apply it using existing libraries. The students will learn how to solve such problems and to implement required algorithms and solutions in Python. The course will provide to the students the basis to understand more complex numerical tools that they may encounter in future courses or in their professional career.
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22BI0004
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Software Construction (L+E) (Softwarekonstruktion)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Knowing how to program does not make a student a software designer. The next step involves learning and practicing the fundamental principles and techniques for designing long-lived software systems. This course helps students learn software design by building examples of small versions of tools that programmers use every day. The course includes a practical component, highlighting the engineering skills needed to design robust software systems. Primarily, the course is taught using Python, with the final lectures introducing Java.
Lernziel	As a result of this course, students will acquire: A solid understanding of the principles and techniques of modern software design, including: - A.1 Concepts and issues of software quality and maintainability - A.2 Code as data - A.3 Object-oriented programming - A.4 Fundamental design patterns (recognized best practices of software architectures) - A.5 Fundamentals of software testing - A.6 Fundamentals of modern software engineering tools B. Experience in collaborative tasks applying these principles and techniques
Unterrichtssprache	English
Voraussetzungen	Informatics I (or equivalent)
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22BI0005
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Wirtschaftsinformatik II (V+Ü) (Business Informatics II)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	- Die Vorlesung behandelt Prozessmanagement und ERP Systeme. Sie hat folgenden Aufbau: Einführung in die Lehrveranstaltung - Prozesse - Business Process Model and Notation (BPMN) - Strategisches Prozessmanagement - Ist/Soll-Modellierung - Implementierung - Process Mining - Enterprise Resource Planning (ERP) - Organisatorische Implementierung - Die begleitenden Übungen behandeln das Modellieren von BPMN, die Ist/Sollmodellierung, die Implementierung mit einer Process Engine sowie die Nutzung von ERPSim. Projektaufgabe.
Lernziel	Lernziel 1: Betrieblich Prozesse analysieren, modellieren, implementieren und managen können. Lernziel 2: ERP Systeme nutzen und implementieren können. (ERP = Enterprise Ressource Planning)
Unterrichtssprache	Deutsch; Hintergrundliteratur und Software kann auf Englisch sein
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22BI0006
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Computer Networks and Distributed Systems (L+E) (Kommunikationsnetze und Verteilte Systeme)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	The Information and Communications Technology (ICT) age has arrived within our daily life, not only during work and business hours, but at a good deal of entertainment and social interactions, too. Thus, the society has to cope with such developments of digitization. Many of those human-centric statements only refer to or try to analyze the impact of these changes and the society. However, in very many cases the fundamentals to derive reliable, correct, and transparent conclusions requires a detailed know-how of Communication Networks and Distributed Systems (CNDS). Therefore, once stand-alone systems are discussed, their interconnection across physical boundaries of an office or building site forms the major development of the ICT society. While fundamental communication architectures did introduce communications by technical means, achieved over the past 100 years, the development of telephone communications to today's Internet will be covered. Protocols, reliable, unreliable, and secure services, algorithms for finding the corresponding receiver, routing, and basic mechanisms for Internet operations will form this lecture's part one. Furthermore, once stand-alone systems have been interconnected, they constitute Distributed Systems, which form a collection of independent computers that appear to their users as a single coherent system, embedding hardware, within which all machines are fully autonomous, and software, for which users think they deal with a single system. Thus, basic theory and techniques of Distributed Systems are covered in this lecture's part two. Driven by an introduction, naming principles and distributed file systems are outlined. To ensure an application-driven interoperability, approaches for synchronization and coordination are discussed. Examples of Distributed Systems in use are overviewed. Finally, part three will overview the role of security in Computer Networks and Distributed Systems concludes this class.
Lernziel	Students will receive the required insights into basic foundations on Communication Networks and Distributed Systems. More specifically, the lecture will teach communication architectures, network building blocks, shared links, packet switching, end-to-end protocols, selected Internet applications, naming principles, distributed file systems synchronization, coordination, and basic security elements as well as mechanisms. Overall, students will be able to understand which communication systems exist, how Internet-based systems operate world-wise, which communications can be reliable, how the basic inter-operations of Distributed Systems work, and which ones may be secured.
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22BMI003
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Requirements Engineering I (L+E)

ECTS	3
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Specifying requirements is a crucial prerequisite for successful software development. This course gives an introduction to the principles, practices, languages, methods, processes, and tools for specifying and managing requirements.
Lernziel	The students acquire basic knowledge, understanding and skills in the core principles, practices, languages, methods, and processes of Requirements Engineering.
Unterrichtssprache	English
Voraussetzungen	Basic knowledge of software development and modeling. Having taken a course in Software Engineering or read a SE textbook is strongly recommended. Students enrolled in the BSc in Informatics program must have passed the assessment level successfully.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22MI0001
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Information Management (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	This lecture covers the management challenges and opportunities posed by information systems and offers methods to solve those problems. After completion of this course, the student is able to describe the problems and the tasks related to IT management, to explain these problems and tasks and to solve example tasks. Topics covered: 1. Intro, IT and Strategy 2. Business Models 3. IT Outsourcing 4. IT Governance + IT Organization 5. Portfolios 6. Architectures 7. IT Projects 8. IT Benefits Management 9. Agile IT 10. IT Service Management 11. ITIL 12. Oracle Guest Lecture 13. Digital Organizations 14. Future of Work Exercises will include case studies, small projects and paper reading.
Lernziel	There will be guest lectures. This lecture covers the management challenges and opportunities posed by information systems and offers methods to solve those problems. After completion of this course, the student is able to describe the problems and the tasks related to IT management, to explain these problems and tasks and to solve example tasks. Furthermore, students will be able to critically reflect on information management literature.
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22MI0002
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Fundamentals of Software Systems (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Introduction to advanced topics pertaining to the development and evolution of software systems, particularly distributed, data-intensive systems.
Lernziel	The students will acquire and be able to apply knowledge on: - Encoding and Distributed Systems - Unreliable Communication Systems - Consistency and Consensus in Distributed Systems - Distributed Concurrency Control - Distributed Reliability - The Technical Evolution of Software - Software Architecture - Social Aspects of software development - Open Source, Sustainability and Inclusion This will enable students to develop and analyze on their own, at a later stage, maintainable, efficient, performing, and reliable distributed software systems.
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22MI0003
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Fundamentals of Human-Centered Computing

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	This course is an introductory module for Human-Centered Computing.

Students will gain learn knowledge and skills in individual and collaborative work, to work with scholarly literature, and to conduct scholarly discourses.
They will learn concepts and processes from cognitive psychology and how to apply them to improve their thinking and work by themselves and with others.
Students will learn several conceptual frameworks that could help them understand and assess research contributions. They will learn about components and forms of arguments and critiques.
This course will use the scholarly literature from various fields related to Human-Centered Computing.

Lernziel	1. Students understand concepts and processes in cognitive psychology and can articulate how these theories apply to work situations. 2. Students know conceptual frameworks for understanding and assessing research contributions. 3. Students can identify the primary contributions of research papers. 4. Students can assess the credibility of sources of scholarly publications. 5. Students can analyze scholarly arguments and assess their quality. 6. Students can synthesize knowledge from multiple readings. 7. Students can formulate and communicate constructive critiques in scholarly contexts. 8. Students can articulate the strengths and weaknesses of selected research methods.
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Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22MI0004
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Advanced Topics in Artificial Intelligence (AI) (L+E)

[illegible]



Modulkürzel	03SM22MI0005
Modulgruppe	Computer Science
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	03SM22MI0010
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Protocols for Multi-media Communications (PMMK) (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Based on the basic course on communication networks, this PMMK lecture will deepen concepts and principles of efficient networking, advanced communication protocols, data formats and procedures, and their respective Quality-of-Service (QoS) management. It does address the basics in high-speed networks and optical networks, including Passive Optical Networks (PON) being complemented by ADSL, the IP Technology, and MPLS. It is important to note that the PMMK lecture does address an integrated viewpoint of a full communication system, which does outline dependencies of networks, protocols, QoS and network or protocol architectures, especially by addressing QoS basics and its modeling, QoS methods, and QoS monitoring. Additionally, protocols for an operations management, multimedia transport protocols (RTP, SCTP), messaging and overlays (VPN, CDN), optimized transport for multimedia and real-time streaming, and Software-defined Networks (SDN) are introduced and discussed.
Lernziel	Students will receive a deep insight into protocols for multi-media communications, Quality-of-Service (QoS) models, and supporting network technologies. More specifically, the lecture will teach up-to-date knowledge in networks, covering available technology and research. This will enable students to develop on their own at a later stage efficient, performing, and globally applicable multi-media communications. Those protocols and mechanisms taught may leave the grounds of typical text books, which provides hooks to students to see in which way research in that field is undertaken. The finalizing discussion of technologies and QoS-based services offered takes into account where applicable economic incentives, which may limit or encourage the use of a dedicated communication service.
Unterrichtssprache	English
Voraussetzungen	The lecture "Computer Networks and Distributed Systems (CNDS)" is recommended highly, but formally not mandatory, in case of a personal dedication to get hold of those basics on the students' own will.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22MI0011
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Object-Oriented Software Development (V) (Objektorientierte Softwareentwicklung)

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	The lecture provides a comprehensive overview of object-oriented software development. After a short introduction to the basics of object-orientation, the focus is on class libraries, design patterns, and frameworks. Primarily Java and Java-based frameworks such as Spring are used for illustration.
Lernziel	The participants know the core concepts of object-oriented software development. They can apply common design patterns to typical problems. Furthermore, they are able to evaluate a simple software design, suggest improvements and also implement them.
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22MI0012
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Enterprise IT-Architectures (L+E)

ECTS	3
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	The course addresses Enterprise IT Architectures in a digital world by providing an introduction to the work of an architect in the IT industry. Architectural Methods are used to structure, describe, and specify solutions, and to define scope and context as well as logical and runtime architectures based on functional and non-functional requirements. Work products, documents, diagrams and models are discussed and used in order to specify and communicate the architecture of a solution. The students will work in a team on a proposal of a real case and will present their case studies in one of the lectures. In addition, current important technology concepts like cloud computing, web security, SOA (Service Oriented Architecture) and BPM (Business Process Management) will be introduced. Finally, Enterprise Architecture concepts and Governance of architectures within a complex organizational structure of a company will be discussed.
Lernziel	Students learn how architects work and which basic work products are used to specify architectures.
Unterrichtssprache	English
Voraussetzungen	Basis in Software Engineering and Modeling
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22MI0014
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Human Aspects of Software Engineering (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Producing great software as fast as the market demands requires great, productive developers. Yet, what does it mean for an individual developer to be productive, and how can we best help developers to be productive? To answer these questions, researchers in software engineering have been, and are still predominantly looking at the output that software developers create, such as the applications, the source code, or the test cases. This output-oriented focus misses one of the most essential parts in the process of software development: the individual developer who creates the software.

Recent advances in technology afford the opportunity to collect a wide variety of detailed information on a software developer and her work, ranging from the number of resolved work items all the way to the cognitive load the developer experiences while working. The availability and accessibility of data on each developer is enabling us to explore questions about developer productivity in powerful new ways.

In this course, we investigate how we can ensure the human ingenuity and smarts are being amplified by the processes and tools used to create systems, rather than the humans spending precious cognitive effort dealing with mundane or unnecessary problems.

This is an overview of the kinds of topics we cover in this course:

- * quantitative qualitative evaluation of software engineering research
- * (biometric) sensing in software development
- * developer retrospection, productivity, and well-being
- * work fragmentation and interruptions
- * code navigation and exploration
- * program comprehension
- * software development tools and environments.

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



Modulkürzel	03SM22MI0019
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Network Science (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Network Science is an interdisciplinary field of research that has become synonym with the study of multiple complex systems that pervade social and economic systems. Network refer to representations of systems whose constituents are linked together because of social ties, information flow, economic relations, etc. Network modelling is a methodology with ample applications in modern data-intensive fields which has multiple applications in management, marketing, informatics, among multiple others. The course covers topics a wide range of topics: it starts with an introduction to the basic concepts about networks; it then deals with the most important properties that real-world networks exhibit, and how they can be modelled; then, it introduces network analytic techniques to uncover the most important properties of empirical networks. Finally, an introduction to the diffusion of technologies, opinions and rumours (and viruses!) are taught. During the course, special emphasis is employed in introducing network analysis and visualisation tools. The course is highly interactive. All the lectures consist of a theoretical part, then, the students must develop (in small groups and always supported by the instructors) the some practical exercises themselves. This permits them to gain direct experience and familiarity with the concepts taught and the techniques involved. In this participatory environment, multiple exercises and the creation of visualisations play an important role.
Lernziel	At the end of the course students: - are able to construct network representations of complex datasets - characterise and understand topological properties of networks - know the typical characteristics of networks in social, economic and technology systems - can understand mechanisms that lead to the emergence of large scale network properties
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SM22MI0023
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Randomized Algorithms (L)

ECTS	6
Lehrformen	Vorlesung
Allg. Beschreibung	This lecture covers several aspects of randomness in computation. Firstly, we establish basic probabilistic tools, such as linearity of expectation and bounds on probabilities. Building on these we cover the design and analysis of randomized algorithms. Such an algorithm is allowed to use "coin flips" in its decision making. Some randomized algorithms yield significantly better runtimes and/or solution qualities as their deterministic counterparts. We also treat stochastic processes, e. g. Markov chains in the lecture, and give classical applications like 3-SAT. More advanced topics like random graphs, the probabilistic method, and randomized rounding are also covered. Mathematically sound analysis is an important and integral part of this lecture. That is, we will not only state the properties of an algorithm, e.g. its correctness or running time, but also prove them mathematically. In particular, we plan to treat the following topics: Introduction Linearity of Expectation: Concept, Balls-Into-Bins, Coupon Collector, Quicksort Bounds on Probabilities: Markov, Chebyshev, Chernoff, Balls-Into-Bins, Coupon Collector, Quicksort Markov Chains: Concept, Hitting Times and Probabilities, Random Walks, Invariant Distributions, 3-SAT Randomized Rounding: Concept, SET COVER, MAX SAT, Derandomization Probabilistic Method: First- and Second Moment Method, MAX SAT, Random Graphs
Lernziel	The goal is to learn about the most important algorithmic design principles and techniques for their analysis related to randomness in computation.
Unterrichtssprache	English
Voraussetzungen	The content of the following lectures are mandatory prerequisites: 1. Informatics I, 2. Informatics II, 3. Foundations of Computing I
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes 2. Herbstsemester)



Modulkürzel	03SM22MI0043
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Reinforcement Learning (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	This class offers a comprehensive introduction to the field of Reinforcement Learning (RL). Students will explore the core challenges and various approaches within RL. By the end of the course, students will be well-versed in the key concepts and techniques essential for mastering Reinforcement Learning.
Lernziel	By the end of the course, students will understand the key concepts of Reinforcement Learning (RL). Specifically, students will be able to: - Define the key features of RL that distinguishes it from the other fields in Machine Learning - Implement common RL algorithms in code. - Describe various criteria for analyzing RL algorithms and evaluate them based on metrics such as regret, sample complexity, computational complexity, empirical performance, and convergence, as assessed through assignments. - Formulate and solve sequential decision-making problems using relevant RL tools.
Unterrichtssprache	English
Voraussetzungen	- Proficiency in Python - Calculus, Linear Algebra: you should be comfortable taking derivatives and understanding matrix vector operations and notation. - Basic Probability and Statistics: You should know basics of probabilities, Gaussian distributions, mean, standard deviation, etc. - Foundations of Machine Learning
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	03SMDINF2039
Modulgruppe	Computer Science
Modultyp	Wahlpflicht
Organisation	Wirtschaftswissenschaftliche Fakultät

Vision Algorithms for Mobile Robotics (L+E)

ECTS	6
Lehrformen	Vorlesung mit integrierter Übung
Allg. Beschreibung	Have you ever been curious to learn the perception algorithms used in today's self-driving cars and drones and what they have in common with virtual and augmented reality? Then this course is for you! This course introduces you to the key algorithms behind Apple ARKit, Google Visual Positioning Service, Microsoft HoloLens, Magic Leap, Oculus Quest, Oculus Insight, and the NASA Mars rovers. In particular, we course will cover these topics: image formation, filtering, feature extraction, multiple view geometry, dense reconstruction, tracking, image retrieval, event-based vision, visualinertial odometry, and deep learning. Each lecture will be followed by a lab session where you will learn to implement the building block of a visual odometry algorithm in Matlab. By the end of the course, you will integrate all these building blocks into a working visual odometry algorithm.
Lernziel	By the end of the course you will know how to implement the fundamental computer vision algorithms used in mobile robotics, in particular: image formation, filtering, feature extraction, multiple view geometry, dense reconstruction, object tracking, image retrieval, event-based vision, visual-inertial odometry, and deep learning.
Unterrichtssprache	English
Voraussetzungen	—
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM523-510
Modulgruppe	Computational Linguistics and Language Technology in Practice
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Practical Training In-House

ECTS	6
Lehrformen	Praktikum
Allg. Beschreibung	In this module, the students get in touch with scientific project work, that is, they learn how to do basic research. In order to accomplish these kind of skills, they read scientific literature, prepare and annotate data, apply statistical and machine learning methods to solve particular problems. They are also involved in the preparation of articles for workshops and conferences. The students work on a particular (partial) problem in a scientific context or even running project. This module can be booked to credit work done in a scientific project at the UZH. This module can be booked with 6 or 9 ECTS points. The amount of points will be decided in consultation with the module coordinator.
Lernziel	The students (1) get in touch with research (2) read scientific literature (3) are involved in evaluation processes (4) take over particular tasks in the context of a project (5) are involved in the preparation of articles (6) get insights into practical work (7) deepen their knowledge and skills with respect to a particular topic
Unterrichtssprache	Deutsch und/oder Englisch
Voraussetzungen	This module cannot be booked by the students themselves, the booking has to be authorized by the module coordinator. There is no entitlement to this module, the module will only be offered if a suitable position is available in a project. The requirements will be defined according to the topic. 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	dokumentierte praktische Arbeit
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	06SM523-511
Modulgruppe	Computational Linguistics and Language Technology in Practice
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Practical Training Off-Site

ECTS	6
Lehrformen	Praktikum
Allg. Beschreibung	The students gain experience in the application of computational linguistics. They get in touch with the structures and procedures of companies and are involved into the realisation of software in order to solve particular problems of these companies. The students apply what they have learned and adapt it to the needs of a specific commercial sector. Practical Trainings Off-Site are usually stays at companies or public organizations that are involved with Natural Language Processing. The training has to have a relation to Natural Language Processing and they have to be organized autonomously. This module can be booked with 3 or 6 ECTS points. The amount of points will be decided in consultation with the module coordinator.
Lernziel	The students (1) get in touch with language technology companies (2) learn to connect theory and practical work (3) get to know the structures and processes of companies (4) apply what they have learned (5) broaden their knowledge of practical issues
Unterrichtssprache	Deutsch und/oder Englisch
Voraussetzungen	This module cannot be booked by the students themselves, the booking has to be authorized by the module coordinator. A prior application must be approved by the module coordinator in order for the Practical Training Off-Site to be credited. 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	dokumentierte praktische Arbeit
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	06SM523-512
Modulgruppe	Computational Linguistics and Language Technology in Practice
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Programming Project 1

ECTS	6
Lehrformen	Sonstiges
Allg. Beschreibung	Programming projects aim at the consolidation of programming and the acquisition of software engineering skills. Starting with a particular research question and relevant literature, they work on a solution, define milestones, acquire and/or annotate data, implement a program and evaluate it using appropriate data. This module can be booked to credit work done in a programming project. This module can be booked with 3, 6 or 9 ECTS points. The amount of points will be decided in consultation with the module coordinator.
Lernziel	The students (1) autonomously design a project (2) realize the project plan (3) use existing tools (4) do software engineering (5) document their work according to standards (6) evaluate the results (7) use software repositories
Unterrichtssprache	Deutsch und/oder Englisch
Voraussetzungen	In the duration of a study level a maximum of two programming projects can be booked. This module can be booked to credit work done in a programming project. It cannot be booked by the students themselves, the booking has to be authorized by the module coordinator. Before a programming project is started, it is essential to get the permission of the module coordinator (per Email). The prerequisites will be set according to the topic. 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	dokumentierte praktische Arbeit
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	06SM523-513
Modulgruppe	Computational Linguistics and Language Technology in Practice
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Student Teaching Assistant 1

ECTS	6
Lehrformen	Sonstiges
Allg. Beschreibung	A student teaching assistance serves the acquisition of basic teaching skills. This requires a deeper insight of the contents of the associated lecture and the ability to prepare teaching material in order to help the students to better understand it. The task also involves the preparation and correction of exercises. This module can be booked to credit the conducting of exercises/tutorials. This module can be booked with 3 or 6 ECTS points. The amount of points will be decided in consultation with the module coordinator.
Lernziel	The students (1) cope with computational linguistics content from a teaching perspective (2) learn to prepare computational linguistics content in a way tailored to a student's audience (3) learn to correct exercises and give appropriate feedback
Unterrichtssprache	Deutsch und/oder Englisch
Voraussetzungen	In the duration of a study level a maximum of two modules «Student Teaching Assistant» can be booked, whereby the two modules must differ in content (also to any previously completed student teaching assistant modules). This module is booked in order to receive credit for a first job as a student teaching assistant at master's level. This module is an application module, the application has to be authorized by the module coordinator (per Email). The lecturers have to be included in the communication. The open positions for student teaching assistants are usually posted on the mailing list of the Institute of Computational Linguistics (cclist@lists.ifi.uzh.ch) a few weeks before the semester starts. Students interested in conducting exercises/tutorials of a specific course can apply anytime for the position directly with the lecturer and the module coordinator. The module in question must have been passed successfully beforehand. This module is open only to Master's students. It may not be booked by Bachelor's students as a dokumentierte praktische Arbeit
Leistungsnachweis	
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	06SM523-516
Modulgruppe	Computational Linguistics and Language Technology in Practice
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Student Teaching Assistant 2

ECTS	6
Lehrformen	Sonstiges
Allg. Beschreibung	A student teaching assistance serves the acquisition of basic teaching skills. This requires a deeper insight of the contents of the associated lecture and the ability to prepare teaching material in order to help the students to better understand it. The task also involves the preparation and correction of exercises. This module can be booked to credit the conducting of exercises/tutorials. This module can be booked with 3 or 6 ECTS points. The amount of points will be decided in consultation with the module coordinator.
Lernziel	The students: - cope with computational linguistics content from a teaching perspective; - learn to prepare computational linguistics content in a way tailored to a student's audience; - learn to correct exercises and give appropriate feedback.
Unterrichtssprache	Deutsch und/oder Englisch
Voraussetzungen	In the duration of a study level a maximum of two modules «Student Teaching Assistant» can be booked, whereby the two modules must differ in content (also to any previously completed student teaching assistant modules). This module is booked in order to receive credit for a second job as a student teaching assistant at master's level. This module is an application module, the application has to be authorized by the module coordinator (per Email). The lecturers have to be included in the communication. The open positions for student teaching assistants are usually posted on the mailing list of the Institute of Computational Linguistics (cclist@lists.ifi.uzh.ch) a few weeks before the semester starts. Students interested in conducting exercises/tutorials of a specific course can apply anytime for the position directly with the lecturer and the module coordinator. The module in question must have been passed successfully beforehand. This module is open only to Master's students. It may not be booked by Bachelor's students as a dokumentierte praktische Arbeit
Leistungsnachweis	
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	06SM523-517
Modulgruppe	Computational Linguistics and Language Technology in Practice
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Programming Project 2

ECTS	6
Lehrformen	Sonstiges
Allg. Beschreibung	Programming projects aim at the consolidation of programming skills and the acquisition of software engineering skills. Starting with a particular research question and relevant literature, they work on a solution, define milestones, acquire and/or annotate data, implement a program and evaluate it using appropriate data. This module can be booked with 3, 6 or 9 ECTS points. The amount of points will be decided in consultation with the module coordinator.
Lernziel	The students: - autonomously design a project; - realise the project plan; - use existing tools; - do software engineering; - document their work according to standards; - evaluate the results; - use software repositories.
Unterrichtssprache	Deutsch und/oder Englisch
Voraussetzungen	In the duration of a study level a maximum of two programming projects can be booked. This module can be booked to credit work done in a second programming project. It cannot be booked by the students themselves, the booking has to be authorized by the module coordinator. Before a programming project is started, it is essential to get the permission of the module coordinator (per Email). The prerequisites will be set according to the topic. 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	dokumentierte praktische Arbeit
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	06SM523-524
Modulgruppe	Other Curricular Modules
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Speech perception and the brain

ECTS	6
Lehrformen	Vorlesung
Allg. Beschreibung	Human listeners can retrieve abstract linguistic messages from speech signals despite of the fact that there is strong variability in acoustic realisations of speech between individuals or between situations. Acquiring a language, listeners have to learn about how sounds group to syllables and syllables group to words and they can perform such decisions on speech despite of highly ambiguous cues to sounds, syllables or words. For this reason different theories of speech perception propose various solutions as to how speech can be perceived apparently effortlessly given its highly variable nature.
Lernziel	The objectives of this lecture series are to (1) understand the fundamental complexity of speech perception (2) understand a variety of different theories explaining speech perception (3) understand about a variety of different physical cues that contribute to the perception of speech
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 (50%), (b) written exam (50%).
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes 2. Herbstsemester)



Modulkürzel	06SM523-526
Modulgruppe	Other Curricular Modules
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	Other Curricular Modules
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Voice Analysis

ECTS	6
Lehrformen	Seminar
Allg. Beschreibung	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.
Lernziel	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.
Unterrichtssprache	Englisch
Voraussetzungen	The participation in "Fundamentals of Speech Sciences and Signal Processing" and "Experiments with speech" 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 the term (20%), (b) oral presentation (20%) and (c) written report (60%).
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	06SM523-531
Modulgruppe	Other Curricular Modules
Modultyp	Wahlpflicht
Organisation	Institut für Computerlinguistik

Our voice: Between linguistic and idiosyncratic information

ECTS	6
Lehrformen	Vorlesung
Allg. Beschreibung	Next to containing a linguistic message, voices play an essential role in human social interaction. Humans can recognize other individuals by their voice, rely on being recognized and recognition failure is a social misconduct that can lead to high embarrassment. Voices signal the emotional state, the fertility in females and help selecting the right mating partner. Voices are a key part of our personality and shape the trust we have in others. In this lecture series we will study the complexity of the human voice by applying a variety of technologies such as laryngography, electromagnetic articulography, ultrasound, endoscopy and myography.
Lernziel	(1) Theoretical understanding of the role of voice in speech communication (2) Acquisition of articulatory procedures for measuring voice production (3) Signal processing skills for the acoustic analysis of voices
Unterrichtssprache	Englisch
Voraussetzungen	- Lecture: Fundamentals of Speech Sciences and Signal Processing - Seminar: Experiments with Speech 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) weekly assignments 40% (b) end of term exam 60%
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes 2. Herbstsemester)



Modulkürzel	10SMSTS-106
Modulgruppe	Other Curricular Modules
Modultyp	Wahl
Organisation	School for Transdisciplinary Studies

UZH Innovathon: The Digitalization of Mobility

ECTS	3
Lehrformen	Seminar
Allg. Beschreibung	This transdisciplinary course equips students with innovation skills through structured, hands-on problem-solving techniques. Innovation is essential for developed economies like Switzerland to sustain their international standing and economic wellbeing. Students learn how to approach problems creatively, collaborate across disciplines, and develop impactful solutions. Working with practice partners, students tackle real-world challenges, contributing directly to solving these. The area of focus is the digitalization of mobility - an area where innovation e.g., clean, autonomous systems or seamless public transport can address societal needs and sustainability goals e.g., by reducing environmental impacts or enhancing inclusivity. The course begins with input from lecturers across various disciplines, offering diverse perspectives to build a strong foundation for understanding and innovation. Then, students engage in doing: developing actionable solutions which eventually may be implemented by industry partners.
Lernziel	See more on our course homepage: https://www.digitalinnovathon.uzh.ch/en.html Innovation Skills: Learn techniques to ideate, prototype, and refine solutions. Communication and Presentation Skills: Learn professional pitching, persuasive storytelling, and clear, impactful communication. Interdisciplinary Collaboration: Experience working with diverse teams, integrating multiple perspectives, and co-creating meaningful outcomes. Professional Interaction: Build skills in engaging with industry partners. Interdisciplinary Knowledge: Explore the digitalization of mobility from diverse disciplinary perspectives, including informatics, law, geography, remote sensing, health sciences, or business administration.
Unterrichtssprache	This course entails interactive collaboration and real-time teamwork. The activities thrive on the energy of being fully present - working together, exchanging ideas, and creating solutions in a vibrant environment. Thus, full on-site participation in all sessions is essential. We understand that English
Voraussetzungen	The number of participants is limited. This is an application module. Please register for the module within the specified deadlines via the UZH module booking tool and include with your application a short description of your personal motivation in a few sentences (max. half a page).



UZH students register via the UZH course catalogue within the specified deadlines.

Non-UZH students who wish to complete the module as mobility students must first observe the application deadlines at UZH (<https://www.uzh.ch/en/studies/application/deadlines.html>) and, after the successful registration at UZH, book the module through the UZH course catalogue.

The course requires an English level of B1/B2.

Leistungsnachweis

Siehe Vorlesungsverzeichnis

Notenskala

1-6, in Viertelschritten

Repetierbarkeit

keine Wiederholungsmöglichkeit

Angebotsmuster

1-semesterig (jedes Herbstsemester)



Modulkürzel	10SMSTS-201
Modulgruppe	Other Curricular Modules
Modultyp	Wahl
Organisation	School for Transdisciplinary Studies

Interdisciplinary Introduction to Machine Learning - Theory

ECTS	3
Lehrformen	Vorlesung
Allg. Beschreibung	This course on machine learning is designed to provide a comprehensive understanding from a multi-disciplinary perspective. Throughout the course, we will delve into the algorithms and techniques that constitute machine learning, while also considering its applications and limitations across various fields - Medicine, Law, Linguistics, Physical Sciences, and Robotics, to name a few. The aim is to equip students with the knowledge to critically assess the suitability of machine learning solutions for different types of challenges. By the end of this course, students should have a nuanced understanding of machine learning's capabilities and restrictions, informed by examples across multiple sectors.
Lernziel	After passing the module, the students are able to: - name fundamentals about functionality and limitations of both supervised and unsupervised machine learning algorithms - list different data types and problem types, such as classification and regression, and match them to the appropriate algorithms - discuss about the vulnerability of and adversarial attacks on machine learning algorithms - give an overview about the wide variety of applications of ML across many disciplines as well as discipline-specific challenges - reflect on machine learning, the promise of artificial intelligence, and big data from a legal, ethical, as well as philosophical perspective
Unterrichtssprache	English
Voraussetzungen	Introduction to concepts of data analysis and statistics.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	10SMSTS-202
Modulgruppe	Other Curricular Modules
Modultyp	Wahl
Organisation	School for Transdisciplinary Studies

Teamwork on Digital Transformation Challenges I

ECTS	3
Lehrformen	Seminar
Allg. Beschreibung	In this module, students work on interdisciplinary projects that address challenges related to digital transformation. Under the guidance of a researcher from the Digital Society Initiative (DSI), students collaborate in interdisciplinary teams of 3-5 members. Each team member takes on defined responsibilities and contributes specific digital skills to the project. After an initial innovation phase, each team engages in an exchange with experts from the DSI network. Depending on the project's focus, teams receive guidance on appropriate digital methods and approaches, as well as input on ethical, legal, social and other relevant considerations. In a follow-up module (6 ECTS) in the spring semester, students have the opportunity to further develop and implement their project ideas in practice.
Lernziel	The students ... - work effectively in interdisciplinary teams on innovative digital transformation challenges. - understand both traditional disciplinary research and new approaches enabled by digitalization. - develop a cross-disciplinary understanding of diverse research questions, methods, and perspectives. - learn to value and integrate different disciplinary approaches. - evaluate project goals, processes, and results using ethical, legal and social criteria. - consider additional project-specific aspects, such as reproducibility and data protection. - apply relevant digital skills in a meaningful and practical way. - prepare and present project results using digital media. - present and discuss project concepts in a World-Café format.
Unterrichtssprache	Englisch
Voraussetzungen	For students enrolled in the Minor / LAO "Digital Skills", passing this compulsory course is a prerequisite for enrolling in the compulsory course "Teamwork on Digital Transformation Challenges II" in the following semester.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	10SMSTS-204
Modulgruppe	Other Curricular Modules
Modultyp	Wahl
Organisation	School for Transdisciplinary Studies

Digital Transformation - a Scientific Overview

ECTS	3
Lehrformen	Seminar
Allg. Beschreibung	This module provides students with a scientific overview of the digital transformation of our society from a multidisciplinary perspective. Students receive academic input followed by an interactive session with various DSI professors and learn to engage with and reflect on the challenges, opportunities and consequences of digital transformation. Sessions are usually structured as follows (exceptions are possible): 15:00 to 15:45: Input lecture by expert 16:15 to 17:00: Group work related to the input lecture
Lernziel	The students ... - obtain a structured overview of research fields that deal with the digital transformation - reflect on the digital transformation of our society both in group discussions and on the individual level - critically consider the social implications of the Digital Society.
Unterrichtssprache	Englisch
Voraussetzungen	None
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	1-6, in Viertelschritten
Repetierbarkeit	einmal wiederholbar
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	10SMSTS-500
Modulgruppe	Other Curricular Modules
Modultyp	Wahl
Organisation	School for Transdisciplinary Studies

Start! Teaching Essentials

ECTS	1
Lehrformen	Seminar
Allg. Beschreibung	In diesem Modul werden didaktische Grundlagen vermittelt. Sie lernen, wie Sie Wissen vermitteln und andere bei ihrem Lernprozess unterstützen können. Das Modul eignet sich ideal als Vorbereitung auf eine Tätigkeit als Tutor:in. Es besteht aus einem OLAT Online-Kurs, der selbstständig bearbeitet wird, und einem 3-stündigen synchronen Workshop (wahlweise online oder in Präsenz). Der OLAT-Kurs besteht aus 5 Bereichen: 1. Standort- und Rollenbestimmung 2. Feedback und Bewerten 3. Präsentieren und Auftreten 4. Unterrichtsplanung 5. Online Lehre English: This module imparts essential didactic principles. You will learn how to convey knowledge and support others on their learning journey. It is an ideal preparation for a tutor role. The module includes a self-paced OLAT online course and a 3-hour workshop (online or in-person). The OLAT course consists of 5 sections: 1. Defining roles 2. Feedback and evaluation 3. Presentation skills 4. Lesson planning 5. Online teaching
Lernziel	Studierende setzen sich mit der Bedeutung verschiedener Erfolgsfaktoren guter Lehre auseinander und reflektieren ihren Kompetenzerwerb in den folgenden Bereichen: - Grundverständnis akademischer Lehrtätigkeit - Standortbestimmung bez. Lehr- und Auftrittskompetenz - Rollenverständnis - Umgang mit Konflikten - Feedback geben und bewerten - Auftrittskompetenzen analysieren und stärken - Unterrichtsplanung und Aktivierung - Einsatz digitaler Technologie für den Lehr- und Lernprozess English: Students engage with the significance of various success factors in effective teaching and reflect on their competencies in the following areas: - Basic understanding of academic teaching - Assessing own teaching and presentation skills
Unterrichtssprache	Deutsch oder Englisch: siehe Sprache der Lehrveranstaltung



Voraussetzungen	Keine Vorkenntnisse notwendig. Dieses Modul ist insbesondere geeignet für (angehende) Tutor:innen mit keiner oder wenig Lehrerfahrung, sowie für Studierende, die sich didaktische Kompetenzen aneignen möchten. English: No prior knowledge required. This module is especially suitable for (aspiring) teaching assistants with no or little teaching experience, as well as for students who wish to develop didactic skills.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Semester)



Modulkürzel	10SMSTS-506
Modulgruppe	Other Curricular Modules
Modultyp	Wahl
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	Other Curricular Modules
Modultyp	Wahl
Organisation	School for Transdisciplinary Studies

Get R_eady: Prognostic & Prediction Modeling in Research

ECTS	1
Lehrformen	Seminar
Allg. Beschreibung	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. 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.
Lernziel	Aims of the course - 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	10SMSTS-510
Modulgruppe	Other Curricular Modules
Modultyp	Wahl
Organisation	School for Transdisciplinary Studies

Raumanalysen interdisziplinär: GIS als digitale Methode

ECTS	3
Lehrformen	Übung
Allg. Beschreibung	Der Kurs bietet eine interdisziplinäre Einführung in die Arbeit mit Geographischen Informationssystemen (GIS) als vielfältig einsetzbarer Methode. Räumliche Daten sind in fast jeder Disziplin wichtig. Sie eröffnen ein breites Spektrum an Einsatzmöglichkeiten, um räumliche Zusammenhänge zu erkennen. Welchen Nutzen hat die Arbeit mit GIS für verschiedene Fachbereiche? Welche Art von Erkenntnissen oder innovativen Fragestellungen sind mit GIS möglich? Welche Besonderheiten ergeben sich bei der Arbeit mit räumlichen Daten, und welche digitalen Werkzeuge stehen dafür zur Verfügung? Wie gelingt der Transfer von der wissenschaftlichen Fragestellung zur technischen Umsetzung, und welche grundlegenden Punkte gilt es dabei zu beachten? Diese Aspekte werden theoretisch beleuchtet, anhand von Fallbeispielen erläutert und in selbstständigen Übungen während des Semesters vertieft. Dabei werden sowohl theoretische Konzepte als auch praktische Umsetzungskompetenzen vermittelt.
Lernziel	Die Teilnehmer:innen kennen verschiedene Einsatzszenarien von GIS und können eigene Beispiele aus ihrer Disziplin skizzieren. Sie sind in der Lage, räumliche Daten selbst zu erheben oder bestehende Daten kritisch zu bewerten und wissen, worauf dabei jeweils zu achten ist. Sie können einfache GIS-Projekte konzipieren, verschiedene Visualisierungsmethoden anwenden und deren jeweilige Vor- und Nachteile benennen. Ausserdem verstehen sie, was ein Geoinformationssystem (GIS) ist und wie es fachspezifische Methoden sinnvoll ergänzen kann.
Unterrichtssprache	Deutsch
Voraussetzungen	Keine besonderen Voraussetzungen.
Leistungsnachweis	Siehe Vorlesungsverzeichnis
Notenskala	bestanden/nicht bestanden
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	1-semesterig (jedes Herbstsemester)



Modulkürzel	10SMSTS-602
Modulgruppe	Other Curricular Modules
Modultyp	Wahl
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	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	06SM523-MA
Modultyp	Pflicht
Organisation	Institut für Computerlinguistik

Master's Thesis

ECTS	30
Lehrformen	Master Paper / MA-Arbeit
Allg. Beschreibung	The "state of the art" is to be reprocessed in relation to the chosen question and the formal rules of the discipline (e.g. regarding references) must be taken into account. For more information please consult the home page of the Institute of Computational Linguistics.
Lernziel	The students (1) are able to cope with a research question in a scientific concise way (2) are able to deal with the relevant research literature (3) use existing language technology or improve existing methods (4) specify und implement their own problem specific algorithm (5) evaluate their systems according to the standards of our discipline (6) concisely describe their work in their Master's thesis
Unterrichtssprache	Englisch
Voraussetzungen	Successful completion of 30% of the required modules. 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	schriftliche Arbeit
Notenskala	1-6, in Halbschritten
Repetierbarkeit	einmal wiederholbar, erneut buchen
Angebotsmuster	2-semesterig (jedes Semester)