

Allgemein

Studiengangsnummer	I49
Studiengang	Computer and Geoscience in Archaeology Computer and Geoscience in Archaeology
Fakultät	Informatik/Mathematik
Abschluss	Master
Erste Immatrikulation	2024
Status	Aktiv (nicht veröffentlicht)
Regelstudienzeit in Semestern	4 Semester
Erforderliche Credits	120
Studienmodus	In Vollzeit studierbar
Studienmodell	Keine Angabe
Für den Auslandsaufenthalt empfohlen	4. FS
Studiengangsverantwortliche/-r	PD Prof. Dr. rer. nat. Marco Block-Berlitz marco.block-berlitz@htw-dresden.de
Dokumente/Ordnungen	

Studienablaufplan

Struktureinheit / Modul	Art	Credits	Semesterwochenstunden (V/Ü/P) / Prüfungen			
			1. Sem.	2. Sem.	3. Sem.	4. Sem.
Geodesy Geodesy G901 Version: 1	Pflichtmodul	5	2/2/0 PVL ³ APL ³			
Geographic Information Systems Geographic Information Systems G975 Version: 2	Pflichtmodul	5	2/0/2 SP ³			
Introduction to Digital Archaeology Introduction to Digital Archaeology I855 Version: 1	Pflichtmodul	5	2/2/0 APL ³			
Applied Mathematics and Computer Science Applied Mathematics and Computer Science I860 Version: 1	Pflichtmodul	5	2/2/2 SP ³			
Applied Programming (Python) Applied Programming (Python) I928 Version: 1	Pflichtmodul	5	0/2/2 APL ³			
Photogrammetry Photogrammetry G902 Version: 1	Pflichtmodul	5		2/0/2 PVL ³ MP ³		
Foundations in Data Science and Engineering Foundations in Data Science and Engineering I851 Version: 1	Pflichtmodul	3		1/0/1 SP ³		
Academic Research and Writing Academic Research and Writing I854 Version: 1	Pflichtmodul	3		1/2/0 APL ³		

Struktureinheit / Modul	Art	Credits	Semesterwochenstunden (V/Ü/P) / Prüfungen			
			1. Sem.	2. Sem.	3. Sem.	4. Sem.
Databases and Research Data Management in Archaeology Databases and Research Data Management in Archaeology I856 Version: 1	Pflichtmodul	5		2/0/2 APL ³		
Computational Archaeology Computational Archaeology I857 Version: 1	Pflichtmodul	5		2/0/2 SP ³		
Archaeological Fieldwork / Internship Archaeological Fieldwork / Internship I861 Version: 1	Pflichtmodul	5		X	0/1/0 APL ³	
Remote Sensing Remote Sensing G982 Version: 1	Pflichtmodul	5			2/2/0 PVL ³ APL ³	
Digital 3D Documentation in Archaeology Digital 3D Documentation in Archaeology I850 Version: 1	Pflichtmodul	5			2/0/2 APL ³	
Project Seminar Digital Archaeology Project Seminar Digital Archaeology I858 Version: 1	Pflichtmodul	5			0/2/0 APL ³	
Reconstructive 3D-Modeling in Archaeology Reconstructive 3D-Modeling in Archaeology I859 Version: 1	Pflichtmodul	4			1/0/3 APL ³	
Introduction to Programming in Java Introduction to Programming in Java I863 Version: 1	Pflichtmodul	5			2/0/2 SP ³	

Struktureinheit / Modul	Art	Credits	Semesterwochenstunden (V/Ü/P) / Prüfungen			
			1. Sem.	2. Sem.	3. Sem.	4. Sem.
Master's Thesis Masterarbeit I862 Version: 1	Pflichtmodul	30				X MA ¹ V ¹
Wahlpflichtmodule 2. Semester Es ist mind. 1 Modul zu wählen.	Block	5		4		
Studium Integrale ⁴ Interdisciplinary Elective Course Version: 1	Wahlpflichtmodul	5		4		
Geography Geography G676 Version: 1	Wahlpflichtmodul	5		2/0/2 PVL ³ APL ³		
Information Visualization Information Visualization I853 Version: 1	Wahlpflichtmodul	5		1/0/3 APL ³		
Wahlpflichtmodule 3. Semester Es ist mind. 1 Modul zu wählen.	Block	5			4	
Studium Integrale ⁴ Interdisciplinary Elective Course Version: 1	Wahlpflichtmodul	5				
Building Information Modeling (BIM) Building Information Modeling (BIM) G449 Version: 2	Wahlpflichtmodul	5			2/0/2 APL ³ APL ³	
German Language - Deutsch als Fremdsprache ⁵ Es ist mind. 1 Modul zu wählen.	Block	5	4			
DaF B A1 I German A1 I S101 Version: 2	Wahlpflichtmodul	5	0/4/0 APL			
DaF B A2 I German A2 I S102 Version: 2	Wahlpflichtmodul	5	0/4/0 APL			

Struktureinheit / Modul	Art	Credits	Semesterwochenstunden (V/Ü/P) / Prüfungen			
			1. Sem.	2. Sem.	3. Sem.	4. Sem.
Summe SWS pro Semester:			26	21	23	0
Summe ECTS-Credits pro Semester:			30	30	30	30

¹ - Die Prüfungsleistung muss mit mindestens „ausreichend“ (4,0) bestanden sein.

² - Nicht benotete Prüfungsleistung, die bestanden sein muss.

³ - Die Prüfungsleistung wird in englischer Sprache abgenommen.

⁴ - Das Modul wird aus dem Studium Integrale Katalog der HTW Dresden gewählt. Es muss einen fachlichen Bezug zum Studiengang "Computer and Geoscience in Archaeology" aufweisen und mit einer Prüfungsleistung abgeschlossen werden.

⁵ - Studierende, die durch geeignete Nachweise die deutsche Sprachniveaustufe A2 nachweisen können, wählen je nach Vorbildung eine andere Stufe des Sprachniveaus in der Deutschausbildung oder Englisch C1. Studierende, die durch Test oder andere geeignete Nachweise sowohl die deutsche Sprachniveaustufe A2 als auch die englische Sprachniveaustufe C1 nachweisen können, wählen eine andere Fremdsprache mit mindestens dem gleichen in der Studienordnung festgelegtem ECTS-Credit-Umfang.

APL - Alternative Prüfungsleistung

MA - Masterarbeit

MP - Mündliche Prüfungsleistung

PVL - Prüfungsvorleistung

SP - Schriftliche Prüfungsleistung

V - Verteidigung

– Studium Integrale



Modul	Studium Integrale Interdisciplinary Elective Course
Modulnummer	Version: 1
Fakultät	Verwaltung
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	
ECTS-Credits	5 Credits
Lehrveranstaltungen	2 SWS (2 SWS Vorlesung)
Prüfungsleistung(en)	Keine Angabe
Lehrinhalte/Gliederung	keine Angabe
Qualifikationsziele	keine Angabe
Besondere Zulassungsvoraussetzung	Keine Angabe

G449 – Building Information Modeling (BIM)



Modul	Building Information Modeling (BIM) Building Information Modeling (BIM)
Modulnummer	G449 Version: 2
Fakultät	Geoinformation
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Praktikum)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Computerprojekt Modulprüfung Wichtigung: 50% wird in englischer Sprache abgenommen Alternative Prüfungsleistung - Schriftliche Leistungskontrolle Modulprüfung Prüfungsdauer: 60 min Wichtigung: 50% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<ul style="list-style-type: none">- Motivation and practical examples for BIM- Differences and similarities of the BIM method with CAD and GIS- Methods of solid modeling- Semantic building models and component orientation- Component libraries, classification systems- Level of Information Needed (LOIN)- Collaboration and Management- Legal framework and standards- Georeferencing of building models- Digital terrain models (DTM) in BIM- Open and proprietary data formats (Industry Foundation Classes, Revit)- Visual programming and creation of plugins for BIM software
Qualifikationsziele	<ul style="list-style-type: none">- Understanding the concepts of semantic and component-oriented building models- Applying commercial BIM software for AEC-planning and asset management, applying BIM and GIS models together- Knowing open BIM standards and data models- Developing simple plugins or software for the BIM method- Understanding BIM as a management method
Besondere Zulassungsvoraussetzung	



Modul	Geography Geography
Modulnummer	G676 Version: 1
Fakultät	Geoinformation
Niveau	Bachelor/Diplom
Dauer	1 Semester
Lehrsprache(n)	Englisch - 90% Deutsch - 10%
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Praktikum)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Mündliche Leistungskontrolle Modulprüfung Wichtung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<ul style="list-style-type: none"> - Geography as a geoscientific subject - Endogenous processes: Plate tectonics, volcanism, cycle of rocks - Exogenous processes: Weathering, erosion and mass transport - Relief types: Valley and river, plains, karst, glacial and coastal landscapes. - Classification of anthropogeography as a branch of geography, - Population geography (demography, ecumenism, social construction), - Settlement geography (rural settlements, towns, settlement history), - Economic geography (agriculture, industry, trade) - Map interpretation - Geographical-topographical excursion
Qualifikationsziele	Geography explores the Earth's physical features, such as landforms, climate, and ecosystems, as well as human geography, which includes the study of populations, cultures, urban development, and more. Students learn about spatial patterns, distribution, and the relationships between various geographic phenomena.
Besondere Zulassungsvoraussetzung	



Modul	Geodesy Geodesy
Modulnummer	G901 Version: 1
Fakultät	Geoinformation
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch - 95% Deutsch - 5%
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Übung)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Mündliche Leistungskontrolle Modulprüfung Prüfungsdauer: 15 min Wichtigung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	Content <ul style="list-style-type: none"> - Introduction to Geodesy - Surveying basics: methods and surveys, documentation of finding spots and buildings - Coordinate and Reference Systems, Spatial Networks, Datum Plans - Techniques: elementary measurement Techniques, trigonometric Survey, Leveling, horizontal Measurement - Measurement devices: Leveling Systems, Total Stations, GNSS Systems - Practical training with above mentioned devices - Outlook: Photogrammetry, Remote Sensing, UAV
Qualifikationsziele	Participants of the course will... <ul style="list-style-type: none"> - know about the basic principles of geodesy and surveying - know about the importance and usage of different spatial reference systems and spatial networks - know how to acquire geodata, such as reference points, from the surveying authorities - be able to use surveying devices such as Levels, Total Stations, and GNSS - be able to choose appropriate measurements devices - be able to create reliable and accurate recordings of the spatial dimensions of archaeological and heritage assets

Besondere Zulassungsvoraussetzung	
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Modul	Photogrammetry Photogrammetry
Modulnummer	G902 Version: 1
Fakultät	Geoinformation
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Praktikum)
Prüfungsleistung(en)	Mündliche Prüfungsleistung Modulprüfung Prüfungsdauer: 20 min Wichtigung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<ul style="list-style-type: none"> - Basics of Photogrammetry (Cameras, relevant topics from mathematics and physics) - Photogrammetric Methods (Mono-, Stereo-, Multi Image Processing) - Close Range Photogrammetry (Optical 3D measurement techniques, Structure-from-Motion) - Aerial and UAV Photogrammetry - Basics of Laser Scanning (Terrestrial, Mobile and Airborne)
Qualifikationsziele	Participants of the course will learn to choose and apply photogrammetric and laser scanner techniques to practical measurement tasks, focusing on archaeological applications.
Besondere Zulassungsvoraussetzung	



Modul	Geographic Information Systems Geographic Information Systems
Modulnummer	G975 Version: 2
Fakultät	Geoinformation
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Praktikum)
Prüfungsleistung(en)	Schriftliche Prüfungsleistung Modulprüfung Prüfungsdauer: 90 min Wichtigung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<ul style="list-style-type: none"> - Introduction into GIS and Spatial Database Systems - Basic models for GIS data and functionality - Spatial reference systems - Data capturing and Georeferencing - Geoprocessing - Map production - Digital terrain models - Availability of GIS data worldwide
Qualifikationsziele	Students will be able to handle GIS data of different sources and formats, process and manage geo-data and display the data in suitable maps
Besondere Zulassungsvoraussetzung	Keine Angabe



Modul	Remote Sensing Remote Sensing
Modulnummer	G982 Version: 1
Fakultät	Geoinformation
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Übung)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Mündliche Leistungskontrolle Modulprüfung Prüfungsdauer: 15 min Wichtigung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<ul style="list-style-type: none"> - Definition and history of remote sensing and photogrammetry - Physical principles of remote sensing - Platforms: Satellites, aircrafts, helicopters and UAS - Sensors: Cameras, optical scanners, RADAR, LIDAR and others - Digital images - Imagery: Image geometry, georeferencing, processing, enhancement analysis and classification - Environmental Monitoring: nature and heritage
Qualifikationsziele	<ul style="list-style-type: none"> - Basic understanding remote sensing - Image processing with ERDAS Imagine - Comprehensive knowledge on the use of appropriate sensors for specific tasks in environmental monitoring - Mastery of basic underlying techniques for image enhancement and analysis - Visualization of image data and results
Besondere Zulassungsvoraussetzung	Keine Angabe



Modul	Digital 3D Documentation in Archaeology Digital 3D Documentation in Archaeology
Modulnummer	I850 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Praktikum)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Computerprojekt Modulprüfung Wichtung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<ul style="list-style-type: none"> - Motivation and introduction - Digital photography as basic tool - Fundamentals of photogrammetry and videogrammetry - Introduction to the use of multicopters - Recording strategies for aerial campaigns - Planning and performing automated flights - Georeferencing and scaling of 3D models - Documentation campaigns with mini-submarines - Automatic image enhancement of underwater photos - Videogrammetry in practice - Combination of photogrammetry and videogrammetry - Planning and execution of documentation campaigns with multicopters
Qualifikationsziele	<p>"They" will be used to shorten students in the remainder of this document to keep the objectives more compact.</p> <ul style="list-style-type: none"> - They are able to master the necessary mathematical and algorithmic basics - They are able to assess, plan and evaluate archaeological documentation with multicopters and submericles - They have a basic understanding of video and photogrammetry methods and know practical problems and solutions - They know methods for the use of augmented reality in museums and can evaluate and apply them - They know formats and solutions for long-term archiving of 3D models
Besondere Zulassungsvoraussetzung	

I851 – Foundations in Data Science and Engineering



Modul	Foundations in Data Science and Engineering Foundations in Data Science and Engineering
Modulnummer	I851 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	3 Credits
Lehrveranstaltungen	2 SWS (1 SWS Vorlesung 1 SWS Praktikum)
Prüfungsleistung(en)	Schriftliche Prüfungsleistung Modulprüfung Prüfungsdauer: 90 min Wichtigung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<p>The term "Data Science" has become an important buzzword in dealing with big data. Data scientists handle and analyze large amounts of data to generate information and derive recommendations for action that enable organizations to work more efficiently. To achieve this, various analytical tools and methods are used to extract valuable information derived from confusing data sets, from which hypotheses are subsequently derived.</p> <p>This lecture provides an end-to-end look at the data science process. In the first part of the lecture, the fundamentals of data management are taught. It will be shown how large dynamic data sets can be integrated, consolidated and finally used for complex analysis tasks. In particular, the topics of data warehousing, multidimensional modeling and relational mapping are covered. Building on this, complex data models, e.g. graphs and visual analysis as a means of data interpretation are discussed. The second part of the lecture covers methods of data analysis. This includes classical statistical methods like classification, clustering and forecasting as well as machine learning methods like neural networks. Besides the methods themselves, modern analysis tools for their application are also presented. The theoretical content of the lectures is complemented by practical exercises.</p>
Qualifikationsziele	<ul style="list-style-type: none">- Learning data management system foundations- Learning practical skills for dealing with error-prone data and its integration- Enablement to choose the correct data analysis methods given concrete usage scenarios- Building own end-to-end scenarios in Python for analyzing data
Besondere Zulassungsvoraussetzung	



Modul	Information Visualization Information Visualization
Modulnummer	I853 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (1 SWS Vorlesung 3 SWS Praktikum)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Semesterarbeit Modulprüfung Wichtung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<p>This module is designed to introduce students to the principles and practices of visualizing data and information. Through a combination of lectures, discussions, and hands-on projects, students will gain practical experience using visualization tools and techniques to analyze and present data in a clear and effective manner. Students will learn how to create effective visualizations that can be used to explore, analyze, and communicate complex data sets.</p> <p>The course covers a range of topics, including the fundamentals of visual perception and cognition, data visualization techniques, and the use of specialized software tools. Students apply their knowledge to real-world data sets and develop their own visualizations. By the end of the course, students will have a deep understanding of the principles of information visualization and will be able to use visualization to effectively communicate data-driven insights. Students will acquire the skills and knowledge needed to create effective visualizations for a variety of applications.</p> <ul style="list-style-type: none"> - Fundamentals: terms and definitions, basic principles, visualization workflow, visual perception - Data preparation: acquisition of data, analysis, transformation, exploration - Visualization process: visual coding, interactivity, idioms, and best practices - Interaction techniques: Focus and context techniques, operating and orienting, filtering and aggregating, coordinating multiple views - Design process: visualization goals, design techniques, prototyping, and realization - Construction kit with building blocks: elements and layout structures, interaction classes, data structures and attribute types, task taxonomy, visualization patterns and their combinations - Tools: generic tools for visualization, program libraries and frameworks- - Applications: search interfaces, visualization of graphs and networks, parallel coordinates and Sankey diagrams - Validation: analysis of existing applications, evaluation of interactive information visualizations

Qualifikationsziele	<ul style="list-style-type: none">- Students know basic terms of information visualization and understand the design process.- Students can systematically analyze and solve challenges in the visualization of abstract data.- Students can design and implement interactive applications for the visualization of information.- Students know methods for the evaluation of information visualizations and can design and conduct empirical studies.
Besondere Zulassungsvoraussetzung	



Modul	Academic Research and Writing Academic Research and Writing
Modulnummer	I854 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	3 Credits
Lehrveranstaltungen	3 SWS (1 SWS Vorlesung 2 SWS Übung)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Portfolio Modulprüfung Wichtung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<p>The course aims to give the participants a sound understanding of scientific work processes and important tools. It's aim is to go beyond the re-iteration of formal obligations in scholarly writing and to foster a deeper understanding of the working of the scientific discourse. At the same time, it tries to convey the knowledge of important tools and techniques for efficient project- and self-management in the process of research and writing. Finally, a glimpse on the possibilities for funding acquisition by grant writing is provided.</p> <p>The course covers the following topics:</p> <ul style="list-style-type: none"> - The process of research - Finding & defining a research topic - Research techniques <ul style="list-style-type: none"> - Literature research - Data research - Important resources - Review and reading techniques - Notetaking and knowledge organisation - Presentation skills - Exposé-writing - Structuring of scholarly texts - Formal requirements of scholarly texts - Techniques of text processing and layout - Citation - AI-Tools for research - Grant writing basics - Important funding agencies

Qualifikationsziele	<p>The participants of this course will</p> <ul style="list-style-type: none"> - ... know the ideas and standards underlying the scholarly research process. - ... be able to find information using various platforms and repositories with various research techniques. - ... be able to formulate research questions and hypotheses. - ... be able to efficiently assess the value of different sources with respect to their own research. - ... be able to process, structure, organize, and present relevant information. - ... be able to conform with the standards of scholarly writing. - ... know about the most important aspects about research funding and grant writing. - ... know some nationally and internationally important funding agencies.
Besondere Zulassungsvoraussetzung	



Modul	Introduction to Digital Archaeology Introduction to Digital Archaeology
Modulnummer	I855 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Übung)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Belegarbeit Modulprüfung Wichtigung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<p>The lecture is designed to provide the participants with a broad knowledge of the fields and topics of computer and geoscience applications in archaeology. It is less concerned with the peculiarities of single technologies, as these will be covered in specialised modules, but more with the theoretical aspects, how quantification and computerization changes and shapes the ways in which knowledge is generated and disseminated in archaeology. In the seminar in connection with the lecture, students will be guided to research a topic on their own and present and discuss the results in a scientific way.</p> <ul style="list-style-type: none"> - History of computer applications in archaeology. - Theoretical and epistemological considerations of quantification in archaeology - Selected topics of digital archaeology and their impact on archaeological research <ul style="list-style-type: none"> - Data structures and databases - Handling and analysis of spatial data - Remote sensing - Artificial intelligence - Implications of 3D technology for archaeological workflows - Open data and open science - Recent developments in the field

Qualifikationsziele	<p>After the lecture, students will ...</p> <ul style="list-style-type: none"> - have a basic understanding a range of computer applications in archaeology. - be aware of the theoretical background and the main debates that accompany the quantification and computerization of archaeological research. - be acquainted with useful resources for the acquisition and publishing of research data. - be acquainted with useful resources for further self-study of established methods and technologies. - have acquired in-depth knowledge of a selected topic by self-study. - have enhanced their skills in scientific research, writing and presentation.
Besondere Zulassungsvoraussetzung	

I856 – Databases and Research Data Management in Archaeology



Modul	Databases and Research Data Management in Archaeology Databases and Research Data Management in Archaeology
Modulnummer	I856 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Praktikum)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Projekt Modulprüfung Wichtung: 100% wird in englischer Sprache abgenommen

Lehrinhalte/Gliederung	<p>In the combined lecture and literature course the following topics will be covered</p> <ul style="list-style-type: none"> - Introduction to the specifics of research data - FAIR and CARE principles - Relevant types of data in archaeological research <ul style="list-style-type: none"> - Types and scales - Digital representation of these types - Modelling, Organization, Storage and Management <ul style="list-style-type: none"> - Relational data model, SQL - Alternative data models - GIS data Models - Formal ontologies - Information Infrastructures - Platforms for publishing and acquisition of data - Standards and guidelines for research data publishing <ul style="list-style-type: none"> - Formats and Types - Metadata - Paradata - Copyright and Licensing - Citation <p>During the practical sessions, the participants will work in small groups to:</p> <ul style="list-style-type: none"> - Practice to develop a data model for a given research or documentation purpose - Implement the model in a Database Management System - Include spatial data in that system and connect it to a GIS - Develop a data management plan - Generate the para- and metadata, and export files for publishing and long-term archiving
Qualifikationsziele	<p>After passing the course, the participants...</p> <ul style="list-style-type: none"> - ... are aware of the importance of adequate data modelling. - ... are capable of designing appropriate data models for research and management purposes in the realm of cultural heritage and archaeology. - ... are capable to implement an information infrastructure for a small project. - ... understand the importance of research data management as an integral part of scientific practice. - ... are able to devise and implement a research data management plan. - ... are aware of the ethical legal issues of research data. - ... are able to prepare research data for publication.
Besondere Zulassungsvoraussetzung	



Modul	Computational Archaeology Computational Archaeology
Modulnummer	I857 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Praktikum)
Prüfungsleistung(en)	Schriftliche Prüfungsleistung Modulprüfung Prüfungsdauer: 90 min Wichtigung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<ul style="list-style-type: none"> - Image processing - Pattern recognition - Agent-based modelling - Procedural generation
Qualifikationsziele	<p>"They" will be used to shorten students in the remainder of this document to keep the objectives more compact.</p> <ul style="list-style-type: none"> - They are able to master the necessary mathematical basics - They will be able to decide in a goal-oriented manner which methods of image processing will improve or prepare the data for a given problem. - They are able to apply simple methods of image processing. - They are able to apply simple pattern recognition methods to a given database. - They are qualified to understand agent-based models and are able to design simple simulations on their own - They are familiar with simple concepts of procedural generation of data
Besondere Zulassungsvoraussetzung	



Modul	Project Seminar Digital Archaeology Project Seminar Digital Archaeology
Modulnummer	I858 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	2 SWS (2 SWS Übung)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Projekt Modulprüfung Wichtung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<p>This module is intended as a practice in self-guided scientific work, preparing the participants for the work on their master's thesis. The participants will develop a research or development project in groups or alone throughout the course of the semester.</p> <p>The participants will apply the digital methods learned so far to their field of archaeological expertise to engage in research-, development-, or dissemination/public outreach projects.</p> <p>There will be regular consultation sessions, where students can discuss their progress and problems with the supervisors and with each other.</p>
Qualifikationsziele	<p>Participants of the course will...</p> <ul style="list-style-type: none"> - ... be able to plan and implement a project by themselves. - ... be able to devise, express and follow a scientific methodology. - ... be able to cooperate in interdisciplinary teams. - ... practice the transfer of acquired knowledge to new fields of application. - ... be able to document their working process and products to create reproducible research. - ... acquire a deeper understanding of a specialised field of expertise.
Besondere Zulassungsvoraussetzung	

I859 – Reconstructive 3D-Modeling in Archaeology



Modul	Reconstructive 3D-Modeling in Archaeology Reconstructive 3D-Modeling in Archaeology
Modulnummer	I859 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	4 Credits
Lehrveranstaltungen	4 SWS (1 SWS Vorlesung 3 SWS Praktikum)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Projekt Modulprüfung Wichtung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<p>The module aims to introduce into the generation of archaeological reconstruction hypotheses by the means of virtual 3D-Modeling.</p> <p>Theory:</p> <ul style="list-style-type: none">- Introduction to basics of reconstructive 3d-Modelling- Documentation of the reconstruction process and the knowledge incorporated in the model- Different fields application of 3d-models in the context of archaeological heritage research and dissemination <p>Practical Part:</p> <ul style="list-style-type: none">- Introduction to 3D-modelling and animation software- Guided student project- Documentation of the reconstruction process
Qualifikationsziele	<p>After the course, the participants will...</p> <ul style="list-style-type: none">- ...know about important standards and conventions on the usage of 3d modelling in cultural heritage- ...be able to create and animate simple virtual 3D models of archaeological heritage objects.- ...be able to reflect upon and document the process of knowledge generation that leads to a reconstruction.- ...be able to critically assess the applicability and value of virtual reconstruction models in research, teaching an presentation of archaeology.
Besondere Zulassungsvoraussetzung	



Modul	Applied Mathematics and Computer Science Applied Mathematics and Computer Science
Modulnummer	I860 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	6 SWS (2 SWS Vorlesung 2 SWS Übung 2 SWS Praktikum)
Prüfungsleistung(en)	Schriftliche Prüfungsleistung Modulprüfung Prüfungsdauer: 90 min Wichtigung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<p>Selected topics of Applied Mathematics</p> <ul style="list-style-type: none"> - Algebraic Concepts and Linear Algebra - Trigonometry and Geometry for Spatial - Analysis in Geoscience - Inferential Statistics - Bayesian Statistics <p>This lecture also provides an overview and insight into various software programs that are frequently used in archaeological work (tools in Computer Aided Archaeology):</p> <ul style="list-style-type: none"> - Processing text - Scientific writing - Translate text - Finding sources - Communication and project planning - Sharing and storing data - Image processing - Image-to-text - Geographic information systems - CAD software and 3d modelling - 3d reconstruction - Statistics - ¹⁴C radiocarbon dating - Organize data - File formats

Qualifikationsziele	<p>"They" will be used to shorten students in the remainder of this document to keep the objectives more compact.</p> <ul style="list-style-type: none"> - They have an overview of the existing software packages in the field of archaeological work - They are able to work hands-on with publishing tools and have an understanding of data management - They know how to use statistical tools and know approaches to research solutions - You know the significance and the difference between commercial and open source solutions
Besondere Zulassungsvoraussetzung	

I861 – Archaeological Fieldwork / Internship



Modul	Archaeological Fieldwork / Internship Archaeological Fieldwork / Internship
Modulnummer	I861 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	2 Semester
Lehrsprache(n)	Englisch in "Archaeological Fieldwork / Internship " Englisch in "Project Colloquium and Report"
ECTS-Credits	5 Credits 4 Credits in "Archaeological Fieldwork / Internship " 1 Credits in "Project Colloquium and Report"
Lehrveranstaltungen	1 SWS (1 SWS Übung) 0 SWS in "Archaeological Fieldwork / Internship " 1 SWS (1 SWS Übung) in "Project Colloquium and Report"
Prüfungsleistung(en)	Alternative Prüfungsleistung - Projekt Modulprüfung Wichtung: 100% wird in englischer Sprache abgenommen

Lehrinhalte/Gliederung	<p>The students have to complete an internship/placement in an excavation/research-project or in a company or institution working with archaeological heritage during the lecture free period after the summer semester. In the next Wintersemester, the students will present and discuss their experience and draft a written report.</p> <p>Archaeological Fieldwork / Internship : keine Angabe</p> <p>The students have to complete an internship/placement in an excavation/research-project or in a company or institution working with archaeological heritage, such as:</p> <ul style="list-style-type: none"> - Conservation Authorities - Commercial cultural resource management/excavation companies - Museums - Archives - Public archaeology initiatives - Service providers in the field <p>The placement has to be at least 3 weeks with 40 hours work per week. The placement time can be split up over the two semesters of the module. The participants work on an individual project during that time. The module is concluded with an oral presentation and a written report in the second semester.</p> <p>Project Colloquium and Report: This final course of the fieldwork/internship module is dedicated to the reflection and discussion of the experiences made during the internship or fieldwork. The students will discuss each others report on their projects and experiences to gain a versatile insight into different fields of work and practice their presentation skills.</p>
Qualifikationsziele	<p>Archaeological Fieldwork / Internship : By participating in archaeological fieldwork or doing an internship, the students will</p> <ul style="list-style-type: none"> - ...become aware of everyday routines of archaeological work - ...reflect on the current state workflows and their possible further development - ...learn to transfer their acquired knowledge to applications in the field - ...be able to structure, record and discuss work processes <p>Project Colloquium and Report: By creating the reports, presenting and discussing it with their peers, the students will...</p> <ul style="list-style-type: none"> - ...know about a range of different work areas - ...improve their skill to textually present own work results - ...improve their skill to orally present to an audience - ...be able to provide constructive criticism - ...be able to use critique as a resource for improvement
Besondere Zulassungsvoraussetzung	



Modul	Master's Thesis Masterarbeit
Modulnummer	I862 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	30 Credits
Lehrveranstaltungen	0 SWS
Prüfungsleistung(en)	<p>Masterarbeit Modulprüfung Wichtigung: 66.67% nicht kompensierbar</p> <p>Verteidigung Modulprüfung Wichtigung: 33.33% nicht kompensierbar</p>
Lehrinhalte/Gliederung	The master's thesis is the final assignment of the programme. By finishing and defending their thesis, students demonstrate their ability to solve a given problem by applying the methods learned during their studies within a fixed timeframe and according to scientific standards.
Qualifikationsziele	<p>By finalising their Master's Thesis, students will prove that they are able to...</p> <ul style="list-style-type: none"> - ...apply scientific methods and practical skills learned during their studies. - ...acquire new theoretical, methodical and practical skills by self-guided study. - ...integrate these methods and skills into a solution to a given problem. - ...document and explain their solutions and results according to scientific standards. - ...reflect and document their working progress. - ...orally present and defend their work facing a scientific audience. - ...provide constructive criticism. - ...use received criticism as a resource for improvement. - ...develop and adhere to efficient strategies of time- and self-organisation. - ...persistently follow through a complex task over a longer period of time.
Besondere Zulassungsvoraussetzung	



Modul	Introduction to Programming in Java Introduction to Programming in Java
Modulnummer	I863 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Vorlesung 2 SWS Praktikum)
Prüfungsleistung(en)	Schriftliche Prüfungsleistung Modulprüfung Prüfungsdauer: 100 min Wichtung: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<ul style="list-style-type: none"> - Programming paradigm motivation - Java basics and programming principles - Introduction to UML and state diagrams - Operations on binary level at the example cryptography - Arrays one and multi-dimensional, literal generation - Debugging, assertions and error handling, error classes - Formatted output - Detecting logical errors (debugging) - Detecting logical errors (Hoare calculus) - Object oriented programming in Java - Inheritance around Object - Everything is object-oriented in Java - Detecting logical errors (Test-Driven-Development) - Graphical user interfaces - Algorithms and data structures in Java - runtime analysis - Algorithms and data structures in Java - Graph theory - Time and data management

Qualifikationsziele	<ul style="list-style-type: none"> - Students will be able to decompose and classify Java and other programming languages into programming paradigms. - Master Java fundamentals and understand the general programming principles that apply to imperative programming languages. - They learn Java, an object-oriented programming language, and develop an understanding of object-oriented programming. - By the end of the course, they will be able to read and design activity and state diagrams from UML and use them in the software development process. - They can understand and apply logical operations in Java at the binary level. - Furthermore, they can know techniques (debugging, assertions, exceptions, verification (e.g. Hoare calculus), unit tests (test-driven development)) for handling the three classes of errors (syntax, runtime, logic) and can use them. - They develop skills in human-machine interaction via an introduction to graphical user interfaces. - Using the skills developed, they can program algorithms and data structures in Java and evaluate and compare solution approaches through knowledge of runtime analysis. - They understand graph theory as a useful tool of informatic thinking and development processes and can implement graphs and their algorithms and use them in the solution process. - Practicing scientific working methods (recognizing, formulating, solving problems, training the ability to abstract). - Training oral communication skills in the exercises by practicing free speech in front of an audience and in discussion.
Besondere Zulassungsvoraussetzung	Keine Angabe



Modul	Applied Programming (Python) Applied Programming (Python)
Modulnummer	I928 Version: 1
Fakultät	Informatik/Mathematik
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Englisch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (2 SWS Übung 2 SWS Praktikum)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Projekt Modulprüfung Wichtigkeit: 100% wird in englischer Sprache abgenommen
Lehrinhalte/Gliederung	<ul style="list-style-type: none"> - Einführung in die python Arbeitsumgebung - Variablen, Datenstrukturen, Rechenoperationen - Steueranweisungen und Programmstrukturen - Datenstrukturen und ihre Anwendung - Arbeit mit Textdateien - Erzeugen von Diagrammen - Einsatz von Erweiterungsmodulen
Qualifikationsziele	<ul style="list-style-type: none"> - Programmieren einer Python-Projektarbeit zur Lösung einer anwendungsbezogenen Aufgabenstellung im Rahmen der Praktikums- und Selbststudienzeit = Synthetisieren - Reflexion von Lösungsansatz und Arbeitsfortschritt im Rahmen von Meilensteingesprächen = Evaluieren - Fachvortrag zur Vorstellung des erarbeiteten Python-Programms im Rahmen der Projektpräsentation (MP) = Anwenden/Verstehen
Besondere Zulassungsvoraussetzung	



Modul	DaF B A1 I German A1 I
Modulnummer	S101 Version: 2
Fakultät	Fremdsprachen (ZFB)
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Deutsch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (4 SWS Übung)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Portfolio Modulprüfung Wichtigung: 100%
Lehrinhalte/Gliederung	<p>Erwerb, Ausbau und Festigung von Grundwortschatz und Redemitteln für typische Kommunikationssituationen im Alltag und an der Hochschule</p> <p>Einführung, Übung und zielgerichtete Anwendung von Elementen der Grundgrammatik</p> <p>Training kommunikativer Sprachkompetenzen (Sprechen, Hören, Lesen, Schreiben)</p> <p>Einführung bzw. Festigung von kommunikativen und Lernstrategien</p>
Qualifikationsziele	Elementare Sprachverwendung auf GER-Niveau A1.1
Besondere Zulassungsvoraussetzung	Keine Angabe



Modul	DaF B A2 I German A2 I
Modulnummer	S102 Version: 2
Fakultät	Fremdsprachen (ZFB)
Niveau	Master
Dauer	1 Semester
Lehrsprache(n)	Deutsch
ECTS-Credits	5 Credits
Lehrveranstaltungen	4 SWS (4 SWS Übung)
Prüfungsleistung(en)	Alternative Prüfungsleistung - Portfolio Modulprüfung Wichtung: 100%
Lehrinhalte/Gliederung	<p>Vertiefung und Erweiterung des Grundwortschatzes</p> <p>Vermittlung von Redemitteln und Kommunikationsstrategien für die Bedürfnisse internationaler Studierender in Deutschland</p> <p>Ausbau, Übung und zielgerichtete Anwendung von Kenntnissen der Grundgrammatik</p> <p>Training kommunikativer Sprachkompetenzen (Sprechen, Hören, Lesen, Schreiben)</p> <p>Einführung bzw. Festigung von Lernstrategien</p>
Qualifikationsziele	Elementare Sprachverwendung auf GER-Niveau A2.1
Besondere Zulassungsvoraussetzung	