universität wien

Announcement

Academic year 2024/2025 – issued on 27 June 2025 – number 164

Any designations of functions are neutral in gender.

Curricula

164 Curriculum for the master's programme in Spatial Data Science and Geocommunication

At its meeting on 26 June 2025, the Senate approved the Curriculum for the master's programme in Spatial Data Science and Geocommunication specified below, which was resolved on 16 June 2025 by the Curriculum Committee, a body holding decision-making power, and established in accordance with section 25, para. 8, no. 3 and para. 1, no. 10a of the 2002 Universities Act.

The legal basis is the 2002 Universities Act and the section of the Statutes of the University of Vienna governing university studies as amended from time to time.

§ 1 Objectives and qualification profile

(1) The master's programme in Spatial Data Science and Geocommunication at the University of Vienna aims at equipping students with advanced subject-specific knowledge in the field of geography and necessary competences, with special emphasis on integrating IT knowledge relating to spatial data science, geoinformatics, geographic artificial intelligence (GeoAI) and geocommunication relevant in practice. Gaining an understanding of, selecting and applying state-of-the-art, data-driven and theory-driven methods of spatial data science go hand in hand with acquiring a thorough understanding of concrete challenges in fields such as population geography, spatial and urban planning, economic geography, geomorphology, geoecology and digital geography. In accordance with the two pillars of data science, students thus acquire knowledge of geography as well as of geoinformation and technology. Today's challenges such as sustainability, climate change, artificial intelligence and digital transformation and the resulting global conflicts require not only interdisciplinary approaches in research but also the ability to communicate research findings in a visual way beyond domains. This master's programme therefore serves to familiarise students with academic as well as practical aspects of spatial data science, thereby preparing them for their future profession, a doctoral programme, as well as for lifelong learning. Graduates of this master's programme can pursue careers in the following occupational fields or positions: working as expert on geo-spatial data analysis, GIS expert, spatial data scientist, expert on geo-marketing, expert on mobility and transport data analysis, location analyst, cartographer and/or expert on geocommunication in industry, science and with public institutions. They can also work in emerging and growing occupational fields which combine subject-specific knowledge of geography and skills in the field of data science.

Abbreviations. SSt (Semesterstunde): hour per week per semester. pi (prüfungsimmanent): continuous assessment. npi (nicht prüfungsimmanent): non-continuous assessment.

(2) Beyond a bachelor's qualification, graduates of the master's programme in Spatial Data Science and Geocommunication at the University of Vienna are qualified to

- collect, identify, analyse and evaluate suitable national and international geodata according to space, subject and time as object information for modelling and visualisations;
- efficiently use systems for managing geodata, geographical information systems, geo-databases, software libraries in the field of modern spatial data science and geographical artificial intelligence, as well as geo-API services;
- use publication types and media with special focus on electronic multimedia (including web publishing) as well as visualise and communicate geodata and results of analyses in correct cartographic design;
- critically reflect on the social links and socio-political implications of different technologies and methods used to process and visualise geodata. This includes a solid understanding of the sustainability of geographical information technologies (including machine learning), the legal principle of data minimisation and its implications for privacy, geo-ethics, reproducibility and the FAIR principles;
- understand relevant domains (such as urban systems, migration, natural risks as well as their interdisciplinary interfaces) as well as specific applications from a professional perspective and thus apply and critically reflect on suitable (research) methods of spatial data science;
- apply state-of-the-art methods and tools and use the soft skills of interdisciplinary work in teams, agile version and project management as well as interactive geocommunication.

In the courses of the degree programme, students address contents and methods meeting the current state of research in the relevant discipline. The focus is on academically sound reflection guided by the current state of research. The master's programme serves the further consolidation of the competences and content acquired in the bachelor's programme.

§ 2 Duration and scope

(1) The workload for the master's programme in Spatial Data Science and Geocommunication comprises 120 ECTS credits. This is equivalent to a stipulated degree programme duration of four semesters.

(2) The programme is deemed completed if 97 ECTS credits as defined in the provisions on compulsory modules, 21 ECTS credits as defined in the provisions on the master's thesis and 2 ECTS credits as defined in the provisions on the master's examination have been obtained.

§ 3 Entry requirements

(1) To be admitted to the master's programme in Spatial Data Science and Geocommunication students must have completed an eligible bachelor's programme or an eligible degree programme at the same level of university education at a recognised Austrian or foreign post-secondary educational institution.

(2) The bachelor's programme in Geography at the University of Vienna is certainly eligible. This degree programme fulfils the qualitative admission requirements specified in section 3.

(3) As qualitative admission requirements, students have to provide evidence of the following:

a) Basic knowledge of geoinformation processing (geographical information systems, geoinformatics, cartography, spatial data science) corresponding to 15 ECTS credits in total.

b) Proficiency in the languages of instruction: German and English. The provisions of the University of Vienna apply regarding the required level of German proficiency (level A2 – Common European Framework of Reference for Languages) and the type of proof to be provided by the students. Students must have English language proficiency corresponding to level B2 (Common European Framework of Reference for Languages). The regulations of the University of Vienna specify the type of proof which must be be provided.

(4) Evidence of knowledge according to para. 3, sub-para. a) is, in any case, the completion of the extension curriculum in Geoinformatics.

If the applicant cannot prove their knowledge in the form of a completed extension curriculum, they have to present a qualification description specifying the achievements completed prior to the submission of the application for admission and which are equivalent to the exams of the two required extension curricula. Based on this qualification description, the competent body for study matters examines whether the qualitative admission requirements are fulfilled. Detailed regulations on the qualification description are provided by the competent body for study matters.

§ 4 Academic degree

Graduates of the master's programme in Spatial Data Science and Geocommunication are awarded the degree 'Master of Science', abbreviated as MSc.
Where the academic degree is stated this must be after the name.

§ 5 Structure – Modules with allocated ECTS credits

(1) Overview

Geography Pool (compulsory module)	20 ECTS credits
Group of compulsory modules: Spatial Data Science and Geocommunication Core Skills	20 ECTS credits
Technical Skills (compulsory module)	*10 ECTS credits*
Domain Skills (compulsory module)	*10 ECTS credits*
Spatial Data Science and Geocommunication Specialisation (compulsory module)	20 ECTS credits
Doing Spatial Data Science (compulsory module)	10 ECTS credits
Individual Specialisation (compulsory module)	20 ECTS credits

Abbreviations. SSt (Semesterstunde): hour per week per semester. pi (prüfungsimmanent): continuous assessment. npi (nicht prüfungsimmanent): non-continuous assessment.

Master's Thesis Seminars (compulsory module)	7 ECTS credits
Master's Thesis	21 ECTS credits
Public Defence	2 ECTS credits

(2) Module descriptions

A) Geography Pool (compulsory module)

Geo-POOL (SDS-P)	**Geography Pool** (compulsory module)	**20 ECTS credits**
Prerequisites	none	
Module outcomes	Students acquire knowledge of the most important academic foundations in the sub-areas of physical geography, human geography and spatial data science. They are able to identify connections with the various academic disciplines and interdisciplinary research approaches. They gain an overview of the current state and demand of research in the relevant disciplines. They are able to identify the drivers of global change, digital transformation and sustainability and their manifold effects, derive socio-spatial issues and fields of action from a geographical perspective, and present and visualise their findings accordingly. The topics covered in the Geography Pool include an introduction to the theoretical basics of the relevant discipline as well as current topics and issues relating to practical problems with a focus on global change, sustainability and digital technologies. According to their choice, students gain an in-depth understanding of various fields of work in physical geography and geoecology, in economic and human geography, in geocommunication and geoinformation (spatial data science), in spatial research and spatial planning as well as urban studies, population geography and demography and/or in digital geography. They are able to follow the current discourse on relevant topical issues.	

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Module structure	Students choose 4 courses (non-continuous assessment, comprising 5 ECTS credits each) corresponding to 20 ECTS credits in total from the following Geography Pool: Lectures: • VO on Advances in Environmental Dynamics and Sustainability (5 ECTS credits, 2 SSt, npi) • VO on Spatial Data Science and Geocommunication (5 ECTS credits, 2 SSt., npi) 2 • VO on Advances in Human Geography (5 ECTS credits, 2 SSt., npi) • VO on Frontiers in Spatial Sciences (5 ECTS credits, 2 SSt., npi) • VO on Sustainability and Digital Transformation (5 ECTS credits, 2 SSt., npi)
Language	English
Proof of performance	Passing of all course examinations specified in the module (npi) (20 ECTS credits in total)

B) Spatial Data Science and Geocommunication: Core Skills (group of compulsory modules)

SDS-TS	**Technical Skills (compulsory module)**	**10 ECTS credits**
Prerequisites	none	
Module outcomes	Students learn to translate real-world problems in the field of geography and earth sciences into computational visualisations, thus acquiring basic competences in computational modelling. They acquire basic knowledge of modern, object-oriented programming, learn to use external API geo services and gain knowledge of basic (spatial) data structures. They also learn to create and query geo-databases as well as to apply data management based on the FAIR principles. Furthermore, students learn about global and local (open) basic data and learn to apply them effectively.	
Module structure	VU on Conceptual Modelling and Programming (5 ECTS credits, 3 SSt., pi) VU on Geo-Data and Geo-Data Management (5 ECTS credits, 3 SSt., pi)	
Language	English and German	
Proof of performance	Passing of all continuous assessment (pi) courses specified in the module (10 ECTS credits in total)	

SDS-DS	**Domain Skills** (compulsory module)	**10 ECTS credits**
Prerequisites	none	
Module outcomes	Students acquire fundamental competences in human geography and/or physical geography. As part of this module, students develop technical skills as well as an understanding of concrete issues, methods and solutions at the interfaces between humans and the environment. This includes knowledge of urban planning, climate migration, economic geography, ecology and geomorphology as well as their practical applications such as in disaster management.	

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Module structure	Subject to availability, students choose courses with non-continuous assessment (npi) and/or courses with continuous assessment (pi) comprising 10 ECTS credits in total • from the master's programme in Human Geography: Global Change and Sustainability Transformations at the University of Vienna and/or • from the master's programme in Physical Geography: Environmental Dynamics and Sustainability at the University of Vienna.
Language	English and German
Proof of performance	Passing of all course examinations (npi) and/or continuous assessment courses (pi) specified in the module (10 ECTS credits in total)

C) Spatial Data Science and Geocommunication Specialisation (compulsory module)

SDS-S	Spatial Data Science and Geocommunication Specialisation (compulsory module)	**20 ECTS credits**
Prerequisites	SDS-TS	
Module outcomes	Students acquire advanced knowledge of the fields of spatial data science and geocommunication as well as of specific application-oriented methods and instruments. The courses of this module provide profound insights into theory and practice in science, industry and public authorities. Since geocommunication and data science are continuously evolving, the contents and technologies are subject to frequent change. Therefore, in addition to specific technical knowledge, students acquire a fundamental abstract, technology-independent understanding of the basic properties of spatial data, processes and methods. Students will be able to draw on these fundamentals for many years in their professional careers. The courses of this module cover state-of-the-art methods of spatial data science, such as GeoAI and information retrieval as well as geocommunication by means of webmapping and geovisualisation. Furthermore, the courses address special methods for specific applications such as protection of privacy, analysis of crime data, disaster management and other topics, e.g. from the fields of digital geography and Internet geography.	

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Module structure	Students choose 4 courses corresponding to 20 ECTS credits in total according to their personal (professional) interest from the following pool of courses: • VU on Webmapping and Story Maps (5 ECTS credits, 2 SSt., pi) • VU on GeoViz and GeoCommunication (5 ECTS credits, 2 SSt., pi) • VU on GeoAI and Machine Learning (5 ECTS credits, 2 SSt., pi) • EX on Spatial Data Science Int. Field Trip (4 ECTS credits, 3 SSt., pi) • KU on EX Spatial Data Science Int. Field Trip (1 ECTS credit, 1 SSt., pi) • VU on Geographic Information Retrieval (5 ECTS credits, 2 SSt., pi) • PS on Spatial Data Science Applications (e.g. Privacy, Conflicts, Crime) (5 ECTS credits, 2 SSt., pi) • SE on Emerging Trends in Spatial Data Science (5 ECTS credits, 2 SSt., pi) The field trip (EX) and the accompanying course (KU on EX) must be completed in combination.
Language	English and German
Proof of performance	Passing of all continuous assessment (pi) courses specified in the module (20 ECTS credits in total)

D) Doing Spatial Data Science (compulsory module)

SDS-DSDS	**Doing Spatial Data Science** (compulsory module)	**10 ECTS credits**
Prerequisites	SDS-TS	
Module outcomes	Students gain insights into current topics and academic literature on spatial data science and geocommunication. They especially learn to acquire knowledge from literature beyond textbooks, synthesise findings across research papers and topics, develop research questions, present findings in teams, moderate discussions and prepare academic publications. Furthermore, students carry out a collaborative project to learn how spatial data science is applied in practice, which tools they can use for collaboration, documentation and the open publication of findings and source code. They also learn how shared version management (e.g. using Git) works and which practical as well as ethical considerations should be taken into account.	
Module structure	SE on Research Seminar: Spatial Data Science and Geocommunication (5 ECTS credits, 3 SSt., pi) LP on Capstone Project (5 ECTS credits, 3 SSt., pi)	
Language	English	
Proof of performance	Passing of all continuous assessment (pi) courses specified in the module (10 ECTS credits in total)	

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E) Individual Specialisation (compulsory module)

SDS-IS	**Individual Specialisation** (compulsory module)	**20 ECTS credits**
Prerequisites	none	
Module outcomes	As part of the *Individual Specialisation* module, students further develop their individual competences in the area of spatial data science and geocommunication through individual academic and/or practical specialisation. Students broaden their knowledge, acquire abilities and skills, build networks for their studies and their future professional career by participating in courses of other disciplines at the University of Vienna, other universities in Austria or abroad (e.g. Erasmus), by completing internships in companies and organisations or by working in research projects.	
Module structure	Subject to availability, students choose courses with non-continuous assessment (npi) and/or courses with continuous assessment (pi) comprising 20 ECTS credits in total. Students can choose from the following options: • individual courses relevant to the topic of the degree programme from appropriate modules of other master's programmes at the University of Vienna and other universities or research institutions in Austria or abroad; • participation in research projects at the Department of Geography and Regional Research and other units of the University of Vienna; • internships clearly relevant to the research and application areas covered by the degree programme at companies, research institutions, organisations, etc. relevant to the topic of the degree programme; corresponding to no more than 10 ECTS credits; • courses not already completed from the modules of the master's programme in Human Geography and/or Physical Geography and/or Spatial Data Science and Geocommunication at the University of Vienna. A confirmation for the hours worked serves as a proof of performance for the participation in research projects and for internships, whereas 1 ECTS credit corresponds to 25 working hours. The competent body responsible for study matters must approve the student's choice in advance.	
Language	English and German	
Proof of performance	Passing of all course examinations (npi) and continuous assessment courses (pi) specified in the module and/or presentation of a confirmation of the hours worked or a confirmation of participation (20 ECTS credits in total)	

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F) Master's Thesis Seminars (compulsory module)

SDS-MT	**Master's Thesis Seminars** (compulsory module)	**7 ECTS credits**
Prerequisites	To be able to participate in the SE Thesis Preparation and Writing, students must have obtained approval for the topic and supervisor of their master's thesis from the competent body responsible for study matters.	
Module outcomes	The students are able to write a master's thesis and present and discuss an intermediate state of the thesis. They receive support in writing their master's thesis and obtain feedback. They are able to develop and correctly formulate concrete research questions.	
Module structure	• SE Thesis Preparation and Writing (5 ECTS credits, 2 SSt., pi) • SE Research Questions (2 ECTS credits, 1 SSt., pi)	
Language	English and German	
Proof of performance	Passing of all continuous assessment (pi) courses specified in the module (7 ECTS credits in total)	

§ 6 Master's thesis

(1) The master's thesis serves to demonstrate the student's ability to achieve adequate standards of content and methodology when independently addressing academic topics. The assignment for the master's thesis must be so chosen that the student can reasonably be expected to complete it within six months.

(2) The topic of the master's thesis must be taken from one of the compulsory modules. If a different topic is selected or if there is uncertainty regarding the allocation of the selected topic, the competent body responsible for study matters decides on whether or not it is admissible.

(3) The master's thesis comprises 21 ECTS credits.

§ 7 Master's examination

(1) To be admitted to a master's examination the student must have successfully passed all required modules and examinations and the master's thesis must have been awarded a positive grade.

(2) The master's examination is a public defence and consists of a defence and an examination on the academic disciplines related to the master's thesis. Grading will be conducted as stipulated in the Statutes of the University of Vienna.

(3) The master's examination is conducted before an examination committee in accordance with the section of the Statutes of the University of Vienna governing university studies.

(4) The master's examination comprises 2 ECTS credits.

§ 8 Mobility during the master's programme

A stay abroad can be completed, in particular, as part of the Individual Specialisation module.

The competent body responsible for study matters is responsible for the recognition of academic achievements completed abroad.

§ 9 Course classification

(1) All courses with non-continuous assessment (npi) have to be offered as one of the following types of courses:

Lecture (*Vorlesung, VO*): Students acquire basic, intermediate and advanced knowledge as well as methodological knowledge. The proof of performance is a written or oral final examination.

(2) All courses with continuous assessment (pi) have to be offered as one of the following types of courses:

Lecture with exercises (*Vorlesung mit Übung, VU*): Students acquire basic, intermediate and advanced knowledge as well as methodological knowledge; this knowledge is then applied, practised and honed in the exercise part. Proof of performance is provided in the form of several (i.e. at least two) partial achievements.

Introductory seminar (*Proseminar*, PS): Students acquire fundamental knowledge of academic research and writing as well as an introduction to specialist literature (preliminary stage of a seminar). Proof of performance is provided in the form of several (i.e. at least two) partial achievements.

Seminar (SE): Students reflect on and discuss specific academic questions and address special topics using current specialist literature and research questions. Proof of performance is provided in the form of several (i.e. at least two) partial achievements.

Excursion (EX): Serves to promote a better understanding of and illustrate research topics by visiting places outside the university buildings. Proof of performance is provided in the form of several (i.e. at least two) partial achievements.

Practical laboratory course (*Laborpraktikum, LP*): Students apply and practise the knowledge and skills acquired under realistic conditions. Proof of performance is provided in the form of several (i.e. at least two) partial achievements.

Course (*Kurs,* KU): Students examine selected areas in the discipline, academic issues and solutions and acquire basic, intermediate and advanced knowledge as well as methodological knowledge. In addition, students address special topics in lectures and dialogue, carry out preparation and follow-up work independently and in teams as well as under supervision. Proof of performance is provided in the form of several (i.e. at least two) partial achievements.

§ 10 Courses with a limited number of participants and registration procedure

(1) The following general limits on the number of students apply in the following courses: Based on available computer workstations in the GIS/MM laboratory:

VU (lecture with exercises): 30 participants

PS (introductory seminar): 30 participants

SE (seminar): 30 participants

KU (course): 30 participants

LP (laboratory project): 30 participants

EX (excursion): 18 participants

SE (Master's Thesis Preparation and Writing): 10 participants

SE (Research Questions): 10 participants

(2) Modalities concerning the registration for courses and examinations as well as the allocation of places in courses are governed by the stipulations of the Statutes of the University of Vienna.

§ 11 Examination regulations

(1) Proof of performance in courses
The lecturer of a course is responsible for making the necessary announcements according to the stipulations in the Statutes.

(2) Examination content
The examination content relevant to preparing and holding examinations must be in line with the required number of ECTS credits. This also applies to module examinations.

(3) Examination procedure
The examination procedure is subject to the stipulations of the Statutes of the University of Vienna.

(4) No double recognition and no dual use
Courses taken and examinations passed in the degree programme, which constitute entry requirements for the master's programme, can only be recognised in the master's programme if there is no significant difference between the learning outcomes of the master's programme and the learning outcomes of the bachelor's programme. Courses taken and examinations passed that are used, in particular, for qualitative entry requirements and on which the master's programme is based, cannot be recognised due to significant differences in the acquired competences. Courses taken and examinations passed from another compulsory or elective module of the degree programme cannot be recognised within another module in the same degree programme.

This also applies to recognition procedures.

(5) Examination results must be allocated to the relevant module by the stated ECTS figure and must not be allocated to different proofs of academic achievement.

§ 12 Entry into force

This Curriculum will enter into force upon announcement in the University Gazette of the University of Vienna as of 1 October 2025.

§ 13 Transitional provisions

(1) This Curriculum applies to all students who commence their degree programme as of the winter semester of 2025/2026.

(2) If, at a later stage of the degree programme, courses are no longer offered which were compulsory under the original curricula, the competent body responsible for study matters decides ex officio (equivalence regulation) or at the request of the participant which courses and examinations have to be completed instead.

(3) Students who have started the master's programme in Cartography and Geoinformation before that date may voluntarily accept the provisions of this Curriculum by simple confirmation.

(4) Students who were subject to the master's curriculum in Cartography and Geoinformation which entered into force prior to this Curriculum (University Gazette of 22 June 2007, 31st edition, no. 168, as amended) are entitled to complete their degree programme by 31 October 2027.

(5) The competent body responsible for study matters specified in the organisational regulations is entitled to determine in general or on a case-by-case basis which of the courses taken and examinations passed will be recognised for this Curriculum.

Appendix

It is recommended to commence the degree programme in the winter

semester. Recommended path through the programme:

Semester	Module	Course	ECTS credits	Total ECTS credits
1st	SDS-P	1 course (e.g. SDS and GC VO)	5	
	SDS-P	1 course (e.g. lecture series)	5	
	SDS-P	1 course (e.g. Human Geography)	5	
	SDS-P	1 course (e.g. Physical Geography)	5	

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	SDS-TS	PS Conceptual Modelling and Programming	5	
	SDS-TS	VU Geo-Data and Research Data Management	5	
				30
2nd	SDS-DS	Course from the master's programme in Human Geography or Physical Geography	5	
	SDS-DS	Course from the master's programme in Human Geography or Physical Geography	5	
	SDS-S	1 course from Specialisation 1	5	
	SDS-S	1 course from Specialisation 2	5	
	SDS-S	1 course from Specialisation 3	5	
	SDS-DSDS	SE Research Seminar: Spatial Data Science	5	
				30
3rd	SDS-DSDS	LP Capstone Project	5	
	SDS-S	1 course from Specialisation 4	5	
	SDS-IS	Courses according to choice	20	
	SDS-MT	SE Research Questions Seminar	2	
				32
4th	SDS-MT	SE Thesis Preparation and Writing	5	
		Master's Thesis	21	
		Public Defence	2	
				28
	Total ECTS credits			120

On behalf of the Senate:
The chairperson of the curriculum committee
S t a s s i n o p o u l o u

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