

Module Handbook

for a Study Program in

Urban Agglomerations

Master of Science (M.Sc.)

Fachbereich 1: Architektur • Bauingenieurwesen • Geomatik

Faculty 1: Architecture • Civil Engineering • Geomatics

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1. Qualification Objectives (General Program Profile)

The Master Course "Urban Agglomerations" (M.Sc.) offers an international and interdisciplinary formation in sustainable planning, development, management and operation of cities and urban agglomerations. Students are qualified through the degree for various leadership and management positions in the following fields: public and private services, urban and regional authorities, development corporations, free-lance consultants, real estate agencies, research institutes engaged in planning, development, management and operation of cities, city-regions and urban agglomerations.

Knowledge and understanding (technical)

After completing their studies, graduates are in a position to:

- interculturally perceive urban problems, experiences and practices as well in developed as in developing countries
- know and understand various approaches to public participation in urban processes
- know and understand project organization and project management tools from a scientific as well as a practical point of view
- understand, formulate and critically evaluate central concerns of intercultural aspects of urbanization, of migration, segregation, and globalization.

Use, application and generation of knowledge (technical; methodical)

After completing their studies, graduates are in a position to:

- apply their knowledge of theories and practice, of instruments, and of physical, functional, and infrastructural concepts for urban and city-regional development,
- apply their knowledge of theories and practice for planning, design and management of technical infrastructure and of green and open spaces in urban agglomerations
- determine the needs of society and users in the design of cities, city districts and public spaces and in the terms of social, ecological and economic sustainability
- take into account social, economic, scientific and ethical findings and refer to them as they occur, for example, as a result of urbanization, of migration, and globalization.
- contribute with their own skills sustainably and constructively to design and planning processes and describe and compare technical differences in various scientific specialist cultures.

Communication and cooperation (personal competence; social competence)

After completing their studies, graduates are in a position to:

- contribute information and solutions argumentatively in the form of discussions, documents, and drawings in favor of common solutions
- present, summarize and describe information on one's own projects to different target groups in a suitable form, as well as consolidate and structure knowledge and information
- have the capacity and methodologies to collect, analyze and present information necessary for decision-making.


Scientific self-image and professionalism (self-competence: personnel)

After completing their studies, graduates are in a position to:

- generate evaluations and (solution) ideas and to further develop them together with experts, using a variety of analogue, electronic and graphic methods to develop, define and present planning proposals
- to approach and to solve complex urban problems in interdisciplinary teams, in cooperation with local authorities, planning departments, and city-regional corporations
- analyze complex cause-and-effect relationships and to reflect and evaluate planning, design and management contexts and problems in a forward-looking manner and deal discursively and constructively with criticism and to assess it.
- independently design further learning processes for themselves.

Through their knowledge, they can contribute to further development in constantly changing professional fields, tasks and socially relevant issues and adapt to these developments. Graduates are able to further qualify themselves scientifically with a doctorate or PhD degree program. Further general information is available at: <https://www.frankfurt-university.de/de/studium/master-studiengange/urban-agglomerations-msc/>

2. Module Overview of Degree Program

Urban Agglomerations (M.Sc.)							 FRANKFURT UNIVERSITY OF APPLIED SCIENCES	
Module Overview							ECTS Points (CP)	
Semester 4	Master Thesis with Colloquium 30 CP						30	
Semester 3	International Exchange Course 30 CP						30	
Semester 2	Interdisciplinary Project 10 CP		Urban Infrastructure: Water and Sewage 5 CP	Urban Infrastructure: Waste and Energy 5 CP	Green and Public Spaces 5 CP	Scientific Methods and Academic Skills 5 CP	Deutsche Sprache und Kommuni- kation 5 CP	30
Semester 1	Urban Development and Sustainable Cities 5 CP	Mobility in Cities 5 CP	Social and Cultural Challenges of Cities 5 CP	Land Management and Land Use Planning 5 CP	Geographical Information Systems (GIS) 5 CP			30

3. ECTS/Workload Overview

Nr.	Module Title	CP ECTS	Duration [Sem.]	Weighting	Type of Examination	Language
1. Semester						
UA M1	Urban Development and Sustainable Cities	5	1	1	Portfolio Examination	English
UA M2	Mobility in Cities	5	1	1	Project Work	English
UA M3	Social and Cultural Challenges of Cities	5	1	1	Portfolio Examination	English
UA M4	Land Management and Land Use Planning	5	1	1	Project Work	English
UA M5	Geographical Information Systems (GIS)	5	1	1	Written Examination	English
1. and 2. Semester						
UA M6	Scientific Methods and Academic Skills	5	1	1	Portfolio Examination	English
UA M7.1	Deutsche Sprache und Kommunikation (A1-Niveau)	5	1	1	Portfolio-Prüfung	Deutsch
UA M7.2	Deutsche Sprache und Kommunikation (A2-B1-Niveau)	5	1	1	Portfolio-Prüfung	Deutsch
2. Semester						
UA M8	Urban Infrastructure: Water and Sewage	5	1	1	Written Assignment	English
UA M9	Urban Infrastructure: Waste and Energy	5	1	1	Written Assignment	English
UA M10	Green and Public Spaces	5	1	1	Project Work	English
UA M11	Interdisciplinary Project	10	1	2	Project Work and Colloquium	English
3. Semester						
UA M12	International Exchange Course	30	1	6	Examination Depending on the Partner University	English
4. Semester						
UA M13	Master Thesis with Colloquium	30	1	12	Master Thesis and Colloquium	English

4. Module Descriptions

UA M1 Urban Development and Sustainable Cities

Module Title	Urban Development and Sustainable Cities
Module Number	UA M1
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	1st semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	5 CP / 150 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	Portfolio examination consisting of two parts: Part 1: written examination, 120 minutes, weighting 50% Part 2: written assignment, submission period 8 weeks, weighting 50% The examination is passed if at least 50% of the possible score has been achieved.
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills)</p> <p>Students are familiar with the trends, characteristics and problems of global urbanization. They have a broad understanding of physical, social, cultural, and economic diversity of urbanization and housing developments in different regions and continents.</p> <p>Students have a comprehensive knowledge of urban development processes both in the past and today.</p> <p>They understand the concept of sustainability and its history as a global political process, along with its urban and transport planning implications for cities.</p> <p>Students appreciate the critical role played by transport in shaping both the form of cities and some of the types of environmental, social and economic problems they experience.</p> <p>Students understand the concept of inclusion in the urban planning process.</p> <p>They have a broad knowledge of Universal Design, its theory and practical application in the urban context.</p> <p>Use, application and generation of knowledge (professional and methodological skills)</p> <p>Students can conceive approaches for developing more sustainable cities which can successfully challenge and change the way cities have grown and developed so far.</p> <p>They can apply their professional knowledge to elaborate physical, functional and infrastructural concepts for more sustainable urban and city-regional development.</p> <p>Students can integrate their expertise in new planning concepts into multidisciplinary contexts.</p> <p>They are capable to structure and develop a given project assignment that conforms to academic norms.</p> <p>Students can apply basic competencies in data analysis, quantitative and qualitative research and academic writing.</p> <p>Communication and cooperation (personal and social competences)</p> <p>Students have developed the capacity for critical evaluation and reflected argumentation.</p> <p>They have practiced communication skills and expressing themselves publicly.</p> <p>Students have presented their ideas and planning concepts in class amongst their peers and teachers within defined time limits.</p> <p>Scientific self-image and professionalism (personal self-competencies)</p> <p>Students are able to estimate and evaluate their own professional abilities and to find out what they might like to make a future career and professional contribution.</p> <p>They are capable to communicate using technical and specific terminology.</p>

	Students are familiar and have practiced to respect intercultural diversity. They understand the variety in cultural norms about city development around the world.
Module Contents	Urban Development and Sustainable Cities
Module Teaching Methods	Lectures, exercises, presentations
Module Language	English
Module Availability	Winter semester
Module Coordination	Prof. Dr.-Ing. Michael Peterek
Comments	-

Unit Description

Unit Title	Urban Development and Sustainable Cities
Code	Internal department reference number or code
Module Title	Urban Development and Sustainable Cities
Unit Contents	<p>Urban and city-regional planning, global urbanization Models, theories and practice of urban development since the period of industrialization Contemporary key-projects, best practices and innovative approaches to urban and city-regional development in Germany and Europe Trends and processes of worldwide urbanization Characters and typologies of cities and urban agglomerations in different regions and continents Processes and typologies of formal and informal settlements and housing provision The making of city-regions, their functions, image and morphologies</p> <p>Sustainable cities Concepts of sustainability, its history and its relationship to cities History of sustainable urban design Urban form and specific eco-social challenges Ecosystem design and community-based planning in sustainable urban design Case studies in more sustainable cities</p> <p>Inclusive cities Demographic challenges of cities in the future Analysis of the meaning of inclusion and Universal Design Qualities of urban districts and neighborhoods in terms of inclusion Standards and legal regulations Looking at the cities potentials and future perspectives</p>
Teaching Methods	Lectures, exercises, presentations
Semester Periods (Hours) per Week	4 SWS
Workload (h)	150 h
Class Hours	60h
Total Time of Examination incl. Preparation (h)	60 h
Total Time of Individual Study (h)	30 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Prof. Dr.-Ing. Michael Peterek / Prof. Dr.-Ing. Jan Dieterle / Prof. Dr. Timo von Wirth / Prof. Dr.-Ing. Caroline Günther
Recommended Reading	Bacon, E. (1976) Design of Cities. Harmondsworth, Middlesex Beatley, T. (2000), Green Urbanism: Learning from European Cities. Island Press, Washington DC

	<p>Brenner, N. and Keil, R. (eds) (2006) <i>The Global Cities Reader</i>. Routledge, London</p> <p>Bueren, E. van, Bohemen, H. van, Itard, L. and Visscher, H. (eds.) (2012) <i>Sustainable Urban Environments – An Ecosystems Approach</i>. Springer. Dordrecht/London/NewYork</p> <p>Burdett, R. and Sudjic, D. (2011) <i>Living in the Endless City</i>. Phaidon, Berlin & London</p> <p>Burdett, R. and Sudjic, D. (2008) <i>The Endless City</i>. Phaidon, Berlin & London</p> <p>Benevolo, L. (1980) <i>History of the City</i>. MIT Press. German Edition: (2000) <i>Die Geschichte der Stadt</i>. Campus Verlag, Frankfurt am Main</p> <p>Birch, E. (2008) <i>The Urban and Regional Planning Reader</i>. Routledge Urban Readers Series, London</p> <p>Brugmann, J. (2009) <i>Welcome to the Urban Revolution. How Cities are Changing the World</i>. Bloomsbury Press, New York et al</p> <p>Calthorpe, P. and Fulton, W. (2001) <i>The Regional City: Planning for the End of Sprawl</i>. Island Press, Washington DC</p> <p>Chen, X. et al (2013) <i>Introduction to Cities. How Place and Space Shape Human Experience</i>. Wiley-Blackwell, Chichester</p> <p>Gehl, J. and Rogers, R. (2010) <i>Cities for People</i>. Island Press, Washington, DC</p> <p>Hall, P. (2002) <i>Urban and Regional Planning</i>. Routledge, London</p> <p>Heiss, O., Ebe, J. and Degenhart, C. (2010), <i>Barrier-Free Design</i>. Birkhäuser, Basel</p> <p>Herwig, O. and Bruce, L. (2013) <i>Universal Design: Solutions for a barrier-free living</i>. Birkhäuser, Basel</p> <p>Hough, M. (2004) <i>Cities and Natural Process: A Basis for Sustainability</i>. Routledge. London</p> <p>Jacobs, J. (1961) <i>The Death and Life of Great American Cities</i>. Random House, New York</p> <p>Jenkins, P. et al (eds) (2007) <i>Planning and Housing in the Rapidly Urbanising World</i>. Routledge, London</p> <p>Jessen, J. et al (2008) <i>stadtmachen.eu: Urbanity and the Planning Culture in Europe</i>. Karl Krämer Verlag, Stuttgart</p> <p>Jover, M. and Wall, A. (2019) <i>Ecologies of Prosperity for the Living</i>. Oro Editions. Novato</p> <p>Landry, C. (2001) <i>The Creative City – A Toolkit for Urban Innovators</i>. Earthscan, London</p> <p>Lehmann, S. (ed.) (2014) <i>Low Carbon Cities: Transforming Urban Systems</i>. Routledge, London</p> <p>LeGates, R.T. (ed) (2011) <i>The City Reader</i>. Routledge, London</p> <p>Mostafavi, M. and Doherty, G. (eds.) (2016) <i>Ecological Urbanism</i>. Lars Müller Publishers. Zürich</p> <p>Newman, P. and Kenworthy, J. (2015) <i>The End of Automobile Dependence: How Cities are Moving Beyond Car-Based Planning</i>. Island Press, Washington, DC</p> <p>Reed, C. and Lister, N.-M. (2014) <i>Projective Ecologies</i>. Actar. Cambridge, Massachusetts; New York</p> <p>Sim, D. (2019) <i>Soft City: Building Density for Everyday Life</i>. Island Press, Washington, DC</p> <p>Simmonds, R. and Hack, G. (2000) <i>Global City Regions: Their Emerging Forms</i>. Spon Press, London</p> <p>Skiba, I. and Züger, R. (2017) <i>Basics Barrier-free Planning</i>. Birkhauser, Basel</p> <p>Tang, Z. (ed.) (2013) <i>Eco-City and Green Community: The Evolution of Planning Theory and Practice</i>. Nova Science Publishers, Hauppauge (NY)</p> <p>TRIALOG. <i>A Journal for Planning and Building in the Third World</i></p> <p>Turner, John F.C. (1976) <i>Housing by People: Towards Autonomy in Building Environments</i>. Marion Boyars Publishing, London</p> <p>Voynovic, I. (ed) (2013) <i>Urban Sustainability. A Global Perspective</i>. Michigan State University Press, East Lansing</p>
Type and Form of Assessment	-
Assessment Grading	-
Comments	-

UA M2 Mobility in Cities

Module Title	Mobility in Cities
Module Number	UA M2
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	1st semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	5 CP / 150 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	Project work, submission period 12 weeks
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills)</p> <p>Students understand the basics of the 4-Step Urban Transport Planning process.</p> <p>They know the limitations and outcomes of the traditional approach to transport planning and are aware of alternative approaches.</p> <p>They have a broad, global appreciation of the importance of urban public transport systems and non-motorised modes (bicycle and pedestrian) and understand how to better cater and promote these modes in cities.</p> <p>Students have a knowledge of scientific methods and practical applications for planning, design and services of transportation systems for moving traffic and stationary traffic.</p> <p>They know best practices and case-studies of transport projects and policies worldwide.</p> <p>They understand key problems confronting urban development today and of fundamental approaches of how to develop more ecologically oriented cities.</p> <p>Use, application and generation of knowledge (professional and methodical skills)</p> <p>Students are able to critically analyse transport plans for their sustainability and relevance to current needs in cities.</p> <p>They have a working knowledge of transport planning techniques and needs for different modes, including the flowing and the parking traffic, public transport, bicycle and pedestrian traffic in cities.</p> <p>They are able to apply their key qualifications and advanced competences of traffic planning, infrastructure planning and relevant sociological interrelations.</p> <p>Students are capable to link and integrate transport proposals into wider urban development concepts.</p> <p>Students have enlarged competencies in data analysis, quantitative research and academic writing.</p> <p>Communication and cooperation (personal and social competences)</p> <p>Students have skills to work in an interdisciplinary planning environment which calls for knowledge and competency across a wide range of transport issues.</p> <p>They are able so solve challenges in teams.</p> <p>They have practiced social and intercultural competencies.</p> <p>They have presented and communicated both in working groups and to larger audiences.</p> <p>Students have developed the capacity for critical evaluation and reflected argumentation.</p> <p>Scientific self-image and professionalism (personal self-competences)</p> <p>Students have developed confidence to participate in scientific and public discussions about the future of mobility and transport systems in cities.</p> <p>They are enthusiastic and self-motivated to apply their knowledge in their professional career.</p> <p>By learning about current scientific research results, students improve their level of professionalism and can develop their own scientific approaches supporting their scientific self-image.</p>

Module Contents	Mobility in Cities
Module Teaching Methods	Seminar, lectures, exercises
Module Language	English
Module Availability	Winter semester
Module Coordination	Prof. Dr.-Ing. Dennis Knese
Comments	-

Unit Description

Unit Title	Mobility in Cities
Code	Internal department reference number or code
Module Title	Mobility in Cities
Unit Contents	<p>Introduction to mobility and transport planning</p> <p>Critique of traditional urban transport planning</p> <p>Environmental and climate impacts of transport</p> <p>Mobility and the Sustainable Development Goals</p> <p>Fundamentals of quality public transport systems</p> <p>Role, importance and prioritization of non-motorized modes</p> <p>Policies and good practices in planning walking and cycling infrastructure</p> <p>Transport demand management</p> <p>Electromobility and future mobility trends</p> <p>Commercial transport</p>
Teaching Methods	Seminar, lectures, exercises, field trips
Semester Periods (Hours) per Week	3 SWS
Workload (h)	150 h
Class Hours	45 h
Total Time of Examination incl. Preparation (h)	60 h
Total Time of Individual Study (h)	45 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Prof. Dr.-Ing. Dennis Knese / Prof. Dr. Dominic Hofmann
Recommended Reading	<p>Banister, D. (2008). The sustainable mobility paradigm. <i>Transport Policy</i>, 15, 73-80.</p> <p>Hickman, R., Mella Lira, B., Givoni, M. and Geurs, K. (2019) <i>A Companion to Transport, Space and Equity</i>, Cheltenham: Edward Elgar.</p> <p>FGSV (2006) <i>Directives for the Design of Urban Roads</i>, RASt 06, Cologne.</p> <p>Vieweg, M., Bongardt, D. and Taeger, J. (2020) <i>Enhancing Climate Action in Transport</i>.</p> <p>Lanzendorf, M., Scheffler, C., Trost, L. and Werschmöller, S. (2022) <i>Implementing bicycle-friendly transport policies: Examining the effect of an infrastructural intervention on residents' perceived quality of urban life in Frankfurt, Germany. Case Studies on Transport Policy</i> 10.</p> <p>Schiller, P., Bruun, E. and Kenworthy, J. (2018) <i>An Introduction to Sustainable Transportation: Policy, Planning and Implementation</i>. Second edition, Routledge, Earthscan, London.</p> <p>Wulfhorst, G. and Büttner, B. (2012): <i>Transport Demand Management</i>, Munich.</p>
Type and Form of Assessment	-
Assessment Grading	-
Comments	-

UA M3 Social and Cultural Challenges of Cities

Module Title	Social and Cultural Challenges of Cities
Module Number	UA M3
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	1st semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	5 CP / 150 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	<p>Portfolio examination consisting of three parts:</p> <p>Part 1: oral presentation, at least 10, at most 20 minutes, weighting 25%</p> <p>Part 2: written assignment, submission period 8 weeks, weighting 25%</p> <p>Part 3: project work, submission period 8 weeks, with presentation, at least 10, at most 20 minutes, weighting 50%</p> <p>The examination is passed if at least 50% of the possible score has been achieved.</p>
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills)</p> <p>Students are familiar with relevant theoretical approaches to cities and city-regions and the respective literature.</p> <p>They have a broad understanding of the contemporary social and cultural challenges of cities and urban agglomerations, segregation processes, the ongoing demographic changes and the effects of a globalizing world on migration and segregation.</p> <p>Students are aware of the role of different stakeholders and public participation in urban governance and urban planning processes.</p> <p>Use, application and generation of knowledge (professional and methodical skills)</p> <p>Students are able to formulate and critically evaluate the central concerns of social and intercultural aspects of urbanization, urbanity and diversity, identity and place.</p> <p>Students are capable to conceive and develop basic structures, methods and procedures of participation processes in urban projects.</p> <p>They can integrate their expertise on social and cultural issues into urban planning concepts and multidisciplinary contexts.</p> <p>Students can structure and develop a given written assignment that conforms to academic norms.</p> <p>Communication and cooperation (personal and social competences)</p> <p>Students have developed the capacity for critical evaluation and reflected argumentation.</p> <p>They have the ability to cooperate in teams, to organize and moderate teamwork and to express and bring an individual position.</p> <p>They have extensive communication skills and confidence in expressing themselves publicly.</p> <p>They are capable to guide and moderate discussions.</p> <p>Scientific self-image and professionalism (personal self-competences)</p> <p>Students are able to estimate and evaluate their own professional role within complex and multidisciplinary urban planning and development processes and a diverse field of different social, cultural and economic actors.</p>
Module Contents	Social and Cultural Challenges of Cities
Module Teaching Methods	Seminar, lectures, exercises
Module Language	English
Module Availability	Winter semester
Module Coordination	Prof. Dr.-Ing. Paola Alfaro d'Alençon

Comments	-
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Unit Description

Unit Title	Social and Cultural Challenges of Cities
Code	Internal department reference number or code
Module Title	Social and Cultural Challenges of Cities
Unit Contents	Theories on cities and urban agglomerations Demography, social structure and urban development Effects of globalization and migration on cities and city-regions Segregation and marginalization processes Citizenship, identity, diversity and the role of place in urban settings Actors and stake-holders in the planning process Forms, methods and case-studies of public participation Practical exercises and training in presentation and moderation
Teaching Methods	Seminar
Semester Periods (Hours) per Week	4 SWS
Workload (h)	150 h
Class Hours	60 h
Total Time of Examination incl. Preparation (h)	60 h
Total Time of Individual Study (h)	30 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Prof. Dr.-Ing. Paola Alfaro d'Alençon
Recommended Reading	Brenner, N. and Keil, R. (eds) (2006) The Global Cities Reader. Routledge, London Fainstein, S. and Campbell, S. (ed) (2011) Readings in Urban Theory. Wiley-Blackwell, Chicester Harvey, D. (2009) Social Justice and the City. University of Georgia Press, Athens (Georgia) Lees, L. et al (2010) The Gentrification Reader. Routledge, London Sassen, S. (2001) The Global City. Princeton University Press, New York et al
Type and Form of Assessment	-
Assessment Grading	-
Comments	-

UA M4 Land Management and Land Use Planning

Module Title	Land Management and Land Use Planning
Module Number	UA M4
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	1st semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	5 CP / 150 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	Project work, submission period 12 weeks
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills)</p> <p>Students have a comprehensive knowledge of the challenges, potentials, strategies and instruments of land management within the context of urban and peri-urban development. They have an understanding of the urban land use planning arena, the land use planning process as a structured decision-making, necessary preparatory works and the interplay of a network of plans on various scales.</p> <p>Students know and understand urban land use planning as public policy making within a legal framework.</p> <p>Use, application and generation of knowledge (professional and methodical skills)</p> <p>Students can evaluate the land management and land use planning influences and impacts to land and housing.</p> <p>They can apply professional and methodological expertise in the assessment of land management, real estate processes, and property valuation.</p> <p>They can design tools and technical devices to secure property and tenure rights for sustainable development in dynamic metropolitan spaces and peri-urban areas.</p> <p>Students are capable to conceive and to structure land use planning processes as a contribution to sustainable development.</p> <p>They can conceive, structure and develop a project that conforms to academic standards.</p> <p>Communication and cooperation (personal and social competences)</p> <p>Students are able to cooperate in teams and to develop and express an individual position. They have practiced communication skills and presented professional concepts and projects in class.</p> <p>Students have a profound knowledge of academic standards, research methods, and writing skills.</p> <p>Scientific self-image and professionalism (personal self-competences)</p> <p>Students have an awareness for public goods and for their role as advocates of the common good in urban planning processes.</p> <p>They are competent to position themselves in an urban and peri-urban land and housing market with the objective to enable sustainable developments and governance structures.</p> <p>They are capable to consolidate and expand a personal professional network in the land management and urban planning sector.</p>
Module Contents	Land Management and Land Use Planning
Module Teaching Methods	Seminar, exercises
Module Language	English
Module Availability	Winter semester
Module Coordination	Prof. Dr. habil. Fabian Thiel
Comments	-

Unit Description

Unit Title	Land Management and Land Use Planning
Code	Internal department reference number or code
Module Title	Land Management and Land Use Planning
Unit Contents	<p>Land management – “land” as a legal, economic and social object</p> <p>Land management and land law – access to land and buildings by legal instruments, the use of lands and buildings, the impact on land real estate markets, the transfer of lands and property and tenure rights within the land management and building trades in dynamic metropolitan spaces and adjacent peri-urban areas</p> <p>Land administration – institutional tools to secure property and tenure rights, adaptation of a land management and real estate system to the local and global application</p> <p>Land and property valuation – the five methods for experimental valuation and building research</p> <p>Legal instruments, hierarchies and procedures of regional and urban land use planning and land management</p> <p>Land use planning practices in an international perspective</p> <p>Land use planning in Germany – preparatory land use plans and binding land use plans</p>
Teaching Methods	Seminar, exercises
Semester Periods (Hours) per Week	4 SWS
Workload (h)	150 h
Class Hours	60 h
Total Time of Examination incl. Preparation (h)	60 h
Total Time of Individual Study (h)	30 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Prof. Dr. habil. Fabian Thiel
Recommended Reading	<p>Berke, Philip R. e. al (2006) Urban Land Use Planning. University of Illinois Press, Urbana and Chicago</p> <p>Gray, K. and Gray, S. F. (2008) Elements of Land Law 5th edition. Oxford University Press, Oxford</p> <p>Gregory, R. et al (2012) Structured Decision Making. A Practical Guide to Environmental Management Choices. Wiley-Blackwell, Chichester, UK</p> <p>Larsson, G. (2010) Land Management as Public Policy. University Press of America, Lanham</p> <p>Scarrett, D. and Osborn, S. (2014) Property Valuation. Routledge, Taylor & Francis Group, London and New York</p> <p>Wilkinson, S., Dixon, T., Miller, N. and Sayce, S. (2018) Routledge Handbook of Sustainable Real Estate. Routledge, Taylor & Francis Group, London and New York.</p> <p>Williamson, I., Enemark, S., Wallace, J. and Rajabifard, A. (2010) Land Administration for Sustainable Development. Redlands (CA)</p>
Type and Form of Assessment	-
Assessment Grading	-
Comments	-

UA M5 Geographical Information Systems (GIS)

Module Title	Geographical Information Systems (GIS)
Module Number	UA M5
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	1st semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	5 CP / 150 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	Written examination, 150 minutes
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills) Students are familiar with the theory and practice of Geographical Information Systems (GIS) within the context of urban agglomerations. They understand the key concepts of Remote Sensing. They have a broad knowledge of the optimal analysis of image data for purposes of urban and city-regional development.</p> <p>Use, application and generation of knowledge (professional and methodical skills) Students are capable to collect, analyze, visualize and interpret basic data with Geographical Information Systems (GIS). They have acquired relevant IT competences to apply and use the instruments of GIS and Remote Sensing in the context of urban and city-regional planning.</p> <p>Communication and cooperation (personal and social competences) Students can identify, structure and solve assignments by means of digital technologies. They can communicate and cooperate in professional and multidisciplinary groups in projects works applying GIS and Remote Sensing technologies.</p> <p>Scientific self-image and professionalism (personal self-competences) Students are able to understand and position the role of data processing technologies such as GIS and Remote Sensing in their professional field and to use these technologies in an appropriate manner.</p>
Module Contents	Geographical Information Systems (GIS)
Module Teaching Methods	Lectures, exercises
Module Language	English
Module Availability	Winter semester
Module Coordination	Prof. Dr.-Ing. Jens Brauneck
Comments	-

Unit Description

Unit Title	Geographical Information Systems (GIS)
Code	Internal department reference number or code
Module Title	Geographical Information Systems (GIS)
Unit Contents	GIS concepts & data integration Remote Sensing basics & analysis techniques

	<p>Data management & geodata structures (vector & raster)</p> <p>Mapping, editing & digitization</p> <p>Georeferencing maps & aerial images</p> <p>Geoprocessing techniques & geodatabases</p> <p>Spatial & 3D analysis (Digital Elevation Models, surface analysis)</p> <p>LiDAR & advanced relief analysis</p> <p>Hydrological analysis & Spatial Analyst tools</p> <p>Laboratory exercises: practical application of GIS to selected topics of interest</p>
Teaching Methods	Seminar, exercises
Semester Periods (Hours) per Week	3 SWS
Workload (h)	150 h
Class Hours	45 h
Total Time of Examination incl. Preparation (h)	60 h
Total Time of Individual Study (h)	45 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Prof. Dr.-Ing. Jens Brauneck
Recommended Reading	<p>Campbell, J.B. Wynne, R.H. and Thomas, V.A. (2023) Introduction to Remote Sensing. 6th edition, The Guilford Press, New York</p> <p>Menke, K. (2022) Discover QGIS 3.x – 2nd Edition, Locate Press</p>
Type and Form of Assessment	-
Assessment Grading	-
Comments	-

UA M6 Scientific Methods and Academic Skills

Module Title	Scientific Methods and Academic Skills
Module Number	UA M6
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	Two semesters
Recommended Semester	1st and 2nd semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	5 CP / 150 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	<p>Portfolio examination consisting of three parts:</p> <p>Part 1: written assignment 1, submission period 6 weeks, weighting 25%</p> <p>Part 2: written assignment 2, submission period 6 weeks, weighting 25%</p> <p>Part 3: written assignment 3, submission period 8 weeks, weighting 50%</p> <p>The examination is passed if at least 50% of the possible score has been achieved.</p>
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills)</p> <p>Students have a comprehensive knowledge about scientific tools and different methods of academic research.</p> <p>They have acquired skills of academic writing in their various components.</p> <p>They are aware of academic norms in the format, style and development of academic papers, reports and theses.</p> <p>They have a basic understanding of qualitative data gathering and analysis processes.</p> <p>All students, regardless of culture or academic background, have a common understanding of plagiarism, its different degrees of seriousness and how to completely avoid it.</p> <p>Use, application and generation of knowledge (professional and methodical skills)</p> <p>Students can systematically structure and practice academic essays and reports in its different components, such as introduction, methodology, main contents, conclusions and referencing and the sub-components of theses.</p> <p>They know how to obtain, use, analyze, discuss and present quantitative data in both table and graphic form, including some basic statistical analyses skills.</p> <p>They know how to generate, analyze, discuss and present qualitative data.</p> <p>Students are able to prepare a structured and comprehensive thesis in all its component parts.</p> <p>Students can apply the expertise learnt in the module through in-class exercises, presentations and group discussions.</p> <p>Communication and cooperation (personal and social competences)</p> <p>Students have practiced to present a self-developed topic in front of an audience, with constructive feedback.</p> <p>Students have practiced the moderation of group meetings and discussions.</p> <p>Scientific self-image and professionalism (personal self-competences)</p> <p>Students are confident in their ability to write essays and reports in an academically sound form.</p> <p>Students have developed an understanding of academic practices and norms across different cultures and different disciplines.</p>
Module Contents	Scientific Methods and Academic Skills
Module Teaching Methods	Seminar
Module Language	English
Module Availability	Winter semester
Module Coordination	Dr.-Ing. Susana Restrepo Rico

Comments	-
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Unit Description

Unit Title	Scientific Methods and Academic Skills
Code	Internal department reference number or code
Module Title	Scientific Methods and Academic Skills
Unit Contents	<p>General introduction to scientific research, including research standards, research design, project proposals, empirical research methods, such as surveys, questionnaires, working with data, map-based analytical tools</p> <p>Key elements of academic essays, projects and theses</p> <p>Master formal academic writing tailored to sustainable urban planning</p> <p>Structure and produce high-quality academic papers, reports, and proposals</p> <p>Collect, analyse, synthesise and interpret quantitative and qualitative data into coherent academic arguments</p> <p>Different referencing styles and norms and their correct usage</p> <p>Understand and apply qualitative, quantitative, and mixed-methods research techniques</p> <p>Incorporating sound quantitative material in tables and graphs</p> <p>Use of qualitative data and visual materials (drawings, photos, models, charts)</p> <p>Communicate data insights effectively, both in academic papers and presentations</p> <p>Maintain academic integrity when using AI, digital tools, and data sources</p> <p>Properly cite sources, avoid plagiarism, and ensure data accuracy</p> <p>Adhere to ethical standards in both qualitative and quantitative research processes</p> <p>Academic writing exercises (essays, reports, projects)</p> <p>Formulate clear research questions, hypotheses, and methodologies</p> <p>Thesis writing exercises</p> <p>Academic presentations</p>
Teaching Methods	Seminar
Semester Periods (Hours) per Week	4 SWS (2 per semester)
Workload (h)	150 h
Class Hours	60 h
Total Time of Examination incl. Preparation (h)	60 h
Total Time of Individual Study (h)	30 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Dr.-Ing. Susana Restrepo Rico
Recommended Reading	<p>Booth, W.C., Colomb, G.G. and Williams, J.M. (2008) The Craft of Research. The University of Chicago Press, Chicago & London.</p> <p>Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches (3rd ed.). Thousand Oaks, CA: SAGE Publications, Inc.</p> <p>Denscombe, M. (2007) The Good Research Guide for Small-Scale Social Research Projects. Open University Press, Maidenhead.</p> <p>Page, M. and Winstanley, C. (2009) Writing Essays for Dummies. Wiley, New Jersey.</p> <p>Swales, J. M., & Feak, C. B. (2012). Academic writing for graduate students: Essential tasks and skills (3rd ed.). Ann Arbor, MI: University of Michigan Press.</p> <p>Woods, G. (2002) Research Papers for Dummies. Wiley, New Jersey.</p>
Type and Form of Assessment	-
Assessment Grading	-
Comments	-

UA M7.1 Deutsche Sprache und Kommunikation (A1-Niveau)

Modultitel	Deutsche Sprache und Kommunikation (A1-Niveau)
Modulnummer	UA M7.1
Modulcode	Module code
Studiengang	Urban Agglomerations (M.Sc.)
Verwendbarkeit des Moduls	
Dauer des Moduls	Zwei Semester
Empfohlenes Semester im Studienverlauf	1. und 2. Semester
Status	Wahlpflichtmodul
ECTS (CP) / Workload (h)	5 CP / 150 h
Inhaltlich erforderliche Voraussetzungen	Keine
Voraussetzung für die Teilnahme am Modul	Keine
Voraussetzung für die Teilnahme an der Modulprüfung	Keine
Modulprüfung	Portfolioprüfung bestehend aus drei Werkstücken: Werkstück 1: Klausur 1, 60 Minuten, Gewichtung 35% Werkstück 2: Klausur 2, 60 Minuten, Gewichtung 35% Werkstück 3: Präsentation, mindestens 5, höchstens 10 Minuten, Gewichtung 30% Die Prüfung gilt als bestanden, wenn mindestens 60% der möglichen Punktzahl erreicht wurden.
Lernergebnis / Kompetenzen	<p>Wissen und Verstehen (fachliche Kompetenzen)</p> <p>Die Studierenden erwerben elementare Sprachstrukturen und Wortschatz – unter besonderer Berücksichtigung fachrelevanter Wortfelder – und lernen die Grundzüge des Systems der Deutschen Sprache (Lexik und Morphosyntax) zu verstehen.</p> <p>Sie verstehen sehr einfache geschriebene Texte zu vertrauten Themen des Alltags und des Studienfachs und erschließen sich dabei in gewissen Umfang neue Wörter.</p> <p>Einsatz, Anwendung und Erzeugung von Wissen (fachliche und methodische Kompetenzen) / Kommunikation und Kooperation (personale und soziale Kompetenzen)</p> <p>Die Studierenden können dieses Erlernte in alltäglichen und studienfachbezogenen Grundsituationen dem (Anfänger)-Niveau (nach GER) entsprechend schriftlich wie mündlich anwenden.</p> <p>Sie können unter Anwendung einfachster erlernter Sprachstrukturen, Ausdrucksweisen und Texte selbst verfassen.</p> <p>Sie können an sehr einfachen alltäglichen und studienfachbezogenen Unterhaltungen teilnehmen und dabei die Gesprächspartner/-innen im Großen und Ganzen verstehen sowie eigene Beiträge unter Verwendung einfachster Ausdrücke und Sätze beisteuern.</p> <p>Wissenschaftliches Selbstverständnis und Professionalität (personale Selbstkompetenz)</p> <p>Die Studierenden können ihren Sprachlernprozess reflektieren und evaluieren.</p> <p>Sie können eigene Stärken und Schwächen erkennen und benennen sowie letztere mit Assistenz der Lehrkraft und ggf. anderer Lernender gezielt verbessern.</p> <p>Sie können Lernstrategien entwickeln und eigene Lernziele formulieren.</p>
Inhalte des Moduls	Deutsche Sprache und Kommunikation (A1-Niveau)
Lehrformen des Moduls	Übungen, Präsentationen und Diskussionen
Sprache	Deutsch
Häufigkeit des Angebots	Wintersemester
Modulkoordination	Sonja Altmüller, Fachsprachenzentrum
Hinweise	Deutsche Muttersprachler und Studierende mit bereits umfassenden Deutschkenntnissen können das Modul „Deutsche Sprache und Kommunikation“ durch ein anderes Sprach- oder Fachmodul ersetzen. Dazu ist die Zustimmung des Prüfungsausschusses einzuholen.

Unit Description

Titel der Unit	Deutsche Sprache und Kommunikation (A1-Niveau)
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Code	Internal department reference number or code
Modultitel	Deutsche Sprache und Kommunikation (A1-Niveau)
Inhalt der Unit	Grundlegende Lexik und Morphosyntax des Deutschen Schriftliche und mündliche Kommunikation in deutscher Sprache im Alltag und im studien(fach)bezogenen Kontext, z.B. Termine vereinbaren Lesen von dem Sprachniveau entsprechend einfachen und kurzen Texten auf Deutsch und fachbezogenen Dokumenten Schreiben auf Deutsch Einführung in die Phonetik und Intonation des Deutschen
Lehrformen	Übungen, Präsentationen und Diskussionen
SWS der Unit	4 SWS (2 SWS je Semester)
Workload (h)	150 h
Anteil Präsenzzeit (h)	60 h
Anteil Prüfungszeit inkl. Prüfungsvorbereitung (h)	60 h
Anteil Selbststudium (h)	30 h
Anteil Praxiszeit (h)	-
Sprache	Deutsch
Lehrende/r	Sonja Altmüller, Fachsprachenzentrum
Empfohlene Literatur	Ein aktuelles, akademisch ausgerichtetes Lehrwerk sowie authentisches Material (Zeitungsartikel, Flyer, Broschüren etc.) mit Studienfachbezug
Art und Form des Leistungsnachweises	-
Bewertung des Leistungsnachweises	-
Hinweise	-

UA M7.2 Deutsche Sprache und Kommunikation (A2-B1-Niveau)

Modultitel	Deutsche Sprache und Kommunikation (A2-B1-Niveau)
Modulnummer	UA M7.2
Modulcode	Module code
Studiengang	Urban Agglomerations (M.Sc.)
Verwendbarkeit des Moduls	
Dauer des Moduls	Zwei Semester
Empfohlenes Semester im Studienverlauf	1. und 2. Semester
Status	Wahlpflichtmodul
ECTS (CP) / Workload (h)	5 CP / 150 h
Inhaltlich erforderliche Voraussetzungen	Keine
Voraussetzung für die Teilnahme am Modul	Keine
Voraussetzung für die Teilnahme an der Modulprüfung	Keine
Modulprüfung	Portfolioprüfung bestehend aus drei Werkstücken: Werkstück 1: Klausur 1, 60 Minuten, Gewichtung 35% Werkstück 2: Klausur 2, 60 Minuten, Gewichtung 35% Werkstück 3: Präsentation, mindestens 5, höchstens 10 Minuten, Gewichtung 30% Die Prüfung gilt als bestanden, wenn mindestens 60% der möglichen Punktzahl erreicht wurden.
Lernergebnis / Kompetenzen	<p>Wissen und Verstehen (fachliche Kompetenzen)</p> <p>Die Studierenden erwerben elementare Sprachstrukturen und Wortschatz – unter besonderer Berücksichtigung fachrelevanter Wortfelder.</p> <p>Sie können eine gewisse Bandbreite verschiedener, eher kürzerer, dem Sprachniveau angemessener Textsorten verstehen, z.B. Zeitungsmeldungen und unkomplizierte, nicht zu lange Zeitungsartikel.</p> <p>Sie können die Hauptpunkte solcher Texte sowie deutlich artikulierter und verlangsamt gesprochener Radiomeldungen verstehen (z.B. Deutsche Welle).</p> <p>Einsatz, Anwendung und Erzeugung von Wissen (fachliche und methodische Kompetenzen) / Kommunikation und Kooperation (personale und soziale Kompetenzen)</p> <p>Die Studierenden können die Hauptpunkte in Unterhaltungen verstehen, wenn in deutlich artikulierter Standardsprache und ggf. leicht verlangsamt Tempo über vertraute Themen des Alltags und des Studienfachs/Studiums gesprochen wird und diese schriftlich wie mündlich zusammengefasst wiedergeben.</p> <p>Sie können an Gesprächen über solche vertrauten Themen des Alltags und des Studienfachs/Studiums teilnehmen, die eigene Situation beschreiben, Gedanken und Meinungen ausdrücken (z.B. Verkehrsmittel, Art und Kosten des Wohnens, Müllvermeidung).</p> <p>Sie können relativ frei über solche vertrauten Themen sprechen, andere informieren und kurze, vorbereitete Referate und kleine Projekte präsentieren.</p> <p>Sie können Notizen machen sowie kurze Berichte schreiben, in denen Sach- und Fachinformationen weitergegeben und teils auch Gründe angegeben werden.</p> <p>Sie können bei allen zuvor genannten Aspekten ein recht breites Spektrum einfacher sprachstruktureller Mittel und einen einigermaßen breiten Wortschatz verwenden.</p> <p>Wissenschaftliches Selbstverständnis und Professionalität (personale Selbstkompetenz)</p> <p>Die Studierenden können ihren Sprachlernprozess reflektieren und evaluieren.</p> <p>Sie können eigene Stärken und Schwächen erkennen und benennen sowie letztere mit Assistenz der Lehrkraft und ggf. anderer Lernender gezielt verbessern.</p> <p>Sie können Lernstrategien entwickeln und eigene Lernziele formulieren.</p>
Inhalte des Moduls	Deutsche Sprache und Kommunikation (A2-B1-Niveau)
Lehrformen des Moduls	Seminar, Übungen, Präsentationen, Diskussionen
Sprache	Deutsch
Häufigkeit des Angebots	Wintersemester
Modulkoordination	Sonja Altmüller, Fachsprachenzentrum
Hinweise	Deutsche Muttersprachler und Studierende mit bereits umfassenden Deutschkenntnissen

	können das Modul „Deutsche Sprache und Kommunikation“ durch ein anderes Sprach- oder Fachmodul ersetzen. Dazu ist die Zustimmung des Prüfungsausschusses einzuholen.
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Unit Description

Titel der Unit	Deutsche Sprache und Kommunikation (A2-B1-Niveau)
Code	Internal department reference number or code
Modultitel	Deutsche Sprache und Kommunikation (A2-B1-Niveau)
Inhalt der Unit	<p>Erweiterte Lexik (Alltag und Studienfach) und erweiterte Morphosyntax</p> <p>Schriftliche und mündliche Kommunikation in deutscher Sprache im Alltag und in studien(fach)bezogenen Kontexten, z.B. Telefonate, E-Mails</p> <p>Lesen von dem Sprachniveau angemessenen, noch eher kurzen Texten in einfach gehaltener Standardsprache zu vertrauten Themen des Alltags und des Studienfachs</p> <p>Schreiben auf Deutsch</p> <p>Vertiefung und Ausbau der Phonetik und Intonation des Deutschen, insbesondere im Hinblick auf bestehende Akzente</p> <p>Lernstrategien wie die Nutzung von Wörterbüchern, auch elektronischen.</p>
Lehrformen	Seminar, Übungen, Präsentationen, Diskussionen
SWS der Unit	4 SWS (2 SWS je Semester)
Workload (h)	150 h
Anteil Präsenzzeit (h)	60 h
Anteil Prüfungszeit inkl. Prüfungsvorbereitung (h)	60 h
Anteil Selbststudium (h)	30 h
Anteil Praxiszeit (h)	-
Sprache	Deutsch
Lehrende/r	Sonja Altmüller, Fachsprachenzentrum
Empfohlene Literatur	Ein aktuelles, akademisch ausgerichtetes Lehrwerk sowie authentisches Material (Zeitungsartikel, Flyer, Broschüren etc.) mit Studienfachbezug
Art und Form des Leistungsnachweises	-
Bewertung des Leistungsnachweises	-
Hinweise	

UA M8 Urban Infrastructure: Water and Sewage

Module Title	Urban Infrastructure: Water and Sewage
Module Number	UA M8
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	2nd semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	5 CP / 150 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	Written assignment, submission period 8 weeks
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills)</p> <p>Students are familiar with the relevant challenges, approaches, instruments and procedures to deal with water demand, collection, management, distribution and supply in cities and surrounding regions.</p> <p>They are aware of environmental and health aspects of water and wastewater pollution.</p> <p>They have a broad knowledge of wastewater components, treatment and disposal.</p> <p>Students are familiar with concepts for stormwater treatment and rainwater harvesting.</p> <p>They have a knowledge of international best practice examples of water sensitive planning and design.</p> <p>Use, application and generation of knowledge (professional and methodical skills)</p> <p>Students can apply their knowledge on water demand, collection, management and supply in cities in urban development concepts and multidisciplinary contexts.</p> <p>Students can apply their knowledge on sewage systems, management, treatment and disposal in urban development concepts and multidisciplinary contexts.</p> <p>They can conceive and elaborate proposals for water sensitive planning and design in cities.</p> <p>Students are capable to structure and develop a given assignment on the topic of urban infrastructure that conforms to academic norms.</p> <p>Communication and cooperation (personal and social competences)</p> <p>Students have developed competencies in structured and sound academic writing.</p> <p>They have cooperated in multidisciplinary teams and presented their results in classroom.</p> <p>They have the capacity for critical evaluation and reflected argumentation.</p> <p>Scientific self-image and professionalism (personal self-competences)</p> <p>Students are able to understand and position the impact of urban infrastructure related to water and wastewater in their professional field of urban and regional development and to conceive and use technologies in an appropriate and sustainable manner.</p>
Module Contents	Urban Infrastructure: Water and Sewage
Module Teaching Methods	Lectures, seminar
Module Language	English
Module Availability	Summer semester
Module Coordination	Prof. Dr.-Ing. Christian Hähnlein
Comments	-

Unit Description

Unit Title	Urban Infrastructure: Water and Sewage
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Code	Internal department reference number or code
Module Title	Urban Infrastructure: Water and Sewage
Unit Contents	<p>Introduction to water and sewage systems: overview of the global water crisis, importance of clean water and sanitation, history of water and sewage systems</p> <p>Water sources and supply: groundwater and surface water resources, water demand, water treatment processes, distribution systems and infrastructure</p> <p>Wastewater collection and treatment: sources of wastewater, collection methods and infrastructure, treatment technologies and processes</p> <p>Stormwater management: importance of stormwater management, best management practices (BMPs), green infrastructure solutions</p> <p>Water and sludge reuse and recycling: benefits, technologies, regulations and policies</p> <p>Case studies and examples: analysis of real-world water and sewage systems, lessons learned and best practices, emerging trends and future directions</p> <p>Assessment and evaluation: performance metrics and indicators, monitoring and reporting requirements, continuous improvement strategies</p>
Teaching Methods	Lectures, seminar
Semester Periods (Hours) per Week	4 SWS
Workload (h)	150 h
Class Hours	60 h
Total Time of Examination incl. Preparation (h)	60 h
Total Time of Individual Study (h)	30 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Prof. Dr.-Ing. Christian Hähnlein
Recommended Reading	<p>Gray, M. (2018) The global water crisis: Addressing an urgent security issue. <i>Brown Journal of World Affairs</i>, 24(2), 235-249. doi: 10.1162/BJWA_a_00376</p> <p>AWWA (2018) <i>Water treatment: Fundamentals of modern water treatment processes</i>. American Water Works Association</p> <p>Metcalf & Eddy Inc., Tchobanoglous, G. et al (2014) <i>Wastewater engineering: Treatment and resource recovery</i>. 5th Edition. McGraw-Hill Education</p> <p>Fletcher, T. D., & Parker, J. C. (Eds.) (2019) <i>Handbook of applied hydrology</i> (3rd ed.). CRC Press</p> <p>Asano, T., & Levine, D. (Eds.). (2018). <i>Water reuse: Issues, technologies, and applications</i>. 4th Edition. McGraw-Hill Education</p> <p>Additional recommended literature will be communicated at the beginning of the course.</p>
Type and Form of Assessment	-
Assessment Grading	-
Comments	-

UA M9 Urban Infrastructure: Waste and Energy

Module Title	Urban Infrastructure: Waste and Energy
Module Number	UA M9
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	2nd semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	5 CP / 150 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	Written assignment, submission period 8 weeks
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills)</p> <p>Students are familiar with the relevant approaches, instruments and procedures of waste composition, prevention, collection, utilization and recycling as well as treatment of solid waste within cities and urban agglomerations.</p> <p>They are aware of global and legal aspects related to waste and energy.</p> <p>They have a broad knowledge of background, challenges and practices of energy demand, production and supply in cities and city-regions.</p> <p>They know the implications related to fossil and renewable energies with regards to the development of more sustainable cities.</p> <p>Students are familiar with concepts for energy efficiency and energy saving on a city and city-regional scale.</p> <p>Use, application and generation of knowledge (professional and methodical skills)</p> <p>Students can apply their knowledge on waste prevention, collection, recycling and treatment processes in urban development concepts and multidisciplinary contexts.</p> <p>Students can apply their knowledge on the theory and practice of energy provision, supply and efficiency in cities in urban development concepts and multidisciplinary contexts.</p> <p>Students are capable to structure and develop a given assignment on the topic of urban infrastructure that conforms to academic norms.</p> <p>Communication and cooperation (personal and social competences)</p> <p>Students have developed competences in structured and sound academic writing.</p> <p>They have cooperated in multidisciplinary teams and presented their results in classroom.</p> <p>They have the capacity for critical evaluation and reflected argumentation.</p> <p>Scientific self-image and professionalism (personal self-competences)</p> <p>Students are able to understand and position the impact of urban infrastructure related to waste and energy in their professional field of urban and regional development and to conceive and use technologies in an appropriate and sustainable manner.</p>
Module Contents	Urban Infrastructure: Waste and Energy
Module Teaching Methods	Lectures, seminar
Module Language	English
Module Availability	Summer semester
Module Coordination	Prof. Dr.-Ing. habil. Antje Welker
Comments	-

Unit Description

Unit Title	Urban Infrastructure: Waste and Energy
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Code	Internal department reference number or code
Module Title	Urban Infrastructure: Waste and Energy
Unit Contents	<p>Waste management</p> <p>Solid waste fractions: quantities and composition</p> <p>Global and legal aspects</p> <p>Waste prevention</p> <p>Collection systems, e.g. separate collection</p> <p>Waste utilization, recycling techniques, e.g. paper, plastics</p> <p>Biological and thermal treatment (incineration plants), landfills</p> <p>Energy</p> <p>Different energy sources used in urban areas, including fossil fuels, nuclear power, renewable energy sources (solar, wind, hydro, geothermal), and their advantages and disadvantages</p> <p>Energy demand in urban agglomerations including analyzing energy data, drivers of energy demand, measurement techniques</p> <p>Integration of energy production, storage, and distribution systems, including smart grids, demand response systems, and energy storage technologies</p> <p>Strategies for energy saving potentials through building design, behavior change, and policy interventions</p>
Teaching Methods	Lectures, seminar
Semester Periods (Hours) per Week	4 SWS
Workload (h)	150 h
Class Hours	60 h
Total Time of Examination incl. Preparation (h)	60 h
Total Time of Individual Study (h)	30 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Prof. Dr.-Ing. habil. Antje Welker / Prof. Dr.-Ing. Christian Hähnlein
Recommended Reading	<p>Waste</p> <p>Bilitewski, B., Härdtle, G., Marek, K. (1997) Waste Management. Springer Verlag, Berlin</p> <p>Chandrupa, R. and Busan Das, D. (2012) Solid Waste Management: Principles and Practice. Springer Verlag, Berlin</p> <p>Christensen, T.H. (2010) Solid Waste Technology & Management, 1 & 2. Wiley-VCH Verlag, Weinheim</p> <p>Ludwig, C., Hellweg, S., Stucki, S. (Eds) (2003) Municipal Solid Waste Management. Strategies and Technologies for Sustainable Solutions. Springer Verlag, Berlin</p> <p>Energy</p> <p>Karl, J., & Oepen, S. E. (2016) Urban Energy Systems: Planning, Design, and Implementation. Springer. doi: 10.1007/978-3-319-40511-6</p> <p>Alanne, A., & Maas, J. (Eds.) (2017) Energy Efficiency in Buildings: Critical Views and Perspectives. Springer. doi: 10.1007/978-3-319-54633-8</p> <p>Hajiani, M., Jafarzadeh, N., & Ghasemi, A. R. (Eds.) (2019) Sustainable Urban Energy Systems: Models, Methods, and Applications. Springer. doi: 10.1007/978-3-030-05641-3</p> <p>Islam, M. S., & Islam, A. H. M. (Eds.) (2019) Energy Demand Modeling: Methods and Applications. Springer. doi: 10.1007/978-3-030-05641-3</p> <p>Islam, M. S., & Islam, A. H. M. (2018). Integration of Renewable Energy in Urban Areas: Technologies, Challenges, and Opportunities. Springer. doi: 10.1007/978-3-319-64556-9</p> <p>Additional recommended literature will be communicated at the beginning of the course.</p>
Type and Form of Assessment	-
Assessment Grading	-
Comments	-

UA M10 Green and Public Spaces

Module Title	Green and Public Spaces
Module Number	UA M10
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	2nd semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	5 CP / 150 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	Project work, submission period 12 weeks
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills)</p> <p>Students understand the importance of green spaces infrastructure in cities from an environmental, social and economic perspective.</p> <p>They have knowledge of the wide variety of ways green design can be incorporated in cities (e.g. urban agriculture, biophilic architecture, parks and squares, community gardens, forests).</p> <p>Students appreciate that the “greening” of cities involves a variety of green technologies for energy, water, waste and transport systems.</p> <p>They understand the global oil problem and the need to green urban transport.</p> <p>Students have knowledge of technical, functional, ecological and aesthetic basics of landscape and open space planning and development in urban agglomerations.</p> <p>They have an understanding about the substance of green, of public spaces and of inclusive cities and their importance for sustainable planning.</p> <p>Students appreciate the diverse typologies, function and designs of public spaces in cities and can compare them with their home cultures and countries.</p> <p>They can understand and reflect different social and cultural attitudes and practices in a variety of green spaces and urban spaces.</p> <p>Use, application and generation of knowledge (professional and methodical skills)</p> <p>Students are able to conceive “green” concepts and proposals for a city and to critique existing efforts.</p> <p>They can transfer the acquired expertise into planning concepts for green and public spaces and integrate it into multidisciplinary contexts.</p> <p>Students are capable to solve key problems within green and public spaces by modifying and improving existing situations, considering social, cultural and physical aspects (such as spatial borders, routes of orientation) for the purpose of a more secure and inclusive city</p> <p>Students are able to structure and develop a given project assignment that conforms to academic norms.</p> <p>Communication and cooperation (personal and social competences)</p> <p>Students have developed the ability of critical and reflected argumentation as well as presentation and communication skills.</p> <p>They have practiced to present their design concepts in front of a group of experts, using technical and specific terminology.</p> <p>Scientific self-image and professionalism (personal self-competences)</p> <p>Students are self-confident in discussing green design and energy matters amongst peers and professionals.</p> <p>They are able to estimate and evaluate their own professional abilities within a multidisciplinary context.</p> <p>They are familiar with and respect for intercultural diversity.</p>
Module Contents	Green and Public Spaces
Module Teaching Methods	Seminar

Module Language	English
Module Availability	Summer semester
Module Coordination	Prof. Dr.-Ing. Caroline Günther
Comments	-

Unit Description

Unit Title	Green and Public Spaces
Code	Internal department reference number or code
Module Title	Green and Public Spaces
Unit Contents	<p>Green cities, blue-green infrastructure</p> <p>Elements, functions and network systems of urban and city-regional green and open spaces</p> <p>Technical knowledge of the elements contributing to the urban ecology (plants, animals, water, climate etc.)</p> <p>Examples of best-practices of urban and city-regional landscape and open space development</p> <p>The role of public space for a social and inclusive city</p> <p>Functions, typologies and design of public spaces</p> <p>Elements and structures of inclusive public spaces – considering all major senses, such as visual, tactile, auditive and olfactory perception</p> <p>Aspects of security within the city, especially focusing on the meaning of anxious spaces</p> <p>Atmospheric situations within public spaces and its relevance for feeling comfortable in a city</p>
Teaching Methods	Seminar
Semester Periods (Hours) per Week	4 SWS
Workload (h)	150 h
Class Hours	60 h
Total Time of Examination incl. Preparation (h)	60 h
Total Time of Individual Study (h)	30 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Prof. Dr.-Ing. Jan Dieterle / Prof. Dr.-Ing. Caroline Günther
Recommended Reading	<p>Carmona, M. et al (2010) Public Places. Urban Spaces: The Dimensions of Urban Design. 2nd Edition. Elsevier, Oxford</p> <p>Gehl, J. and Rogers, R. (2010) Cities for People. Island Press, Washington, DC</p> <p>Lynch, K. (1960) The Image of the City, The MIT Press, Cambridge, MA</p> <p>Waldheim, C. (ed) (2006) The Landscape Urbanism Reader. Princeton Architectural Press, New York</p> <p>Barz-Malfatti, H. and Signer, S. (2024) Die neue Öffentlichkeit. Europäische Stadtplätze des 21. Jahrhunderts. M Books, Weimar</p> <p>Bueren, E. van, Bohemen, H. van, Itard, L. and Visscher, H. (eds.) (2012) Sustainable Urban Environments – An Ecosystems Approach. Springer. Dordrecht/London/NewYork</p> <p>Hough, M. (2004) Cities and Natural Process: A Basis for Sustainability. Routledge. London</p> <p>Jover, M. and Wall, A. (2019) Ecologies of Prosperity for the Living. Oro Editions. Novato</p> <p>Koch, P., de Rudder, S. and Signer, S. (2024): Die neue Öffentlichkeit - Europäische Straßenräume des 21. Jahrhunderts. M Books, Weimar</p> <p>Mostafavi, M. and Doherty, G. (eds.) (2016) Ecological Urbanism. Lars Müller Publishers. Zürich</p> <p>Reed, C. and Lister, N.-M. (2014) Projective Ecologies. Actar. Cambridge, Massachusetts; New York</p>
Type and Form of Assessment	-

Assessment Grading	-
Comments	-

UA M11 Interdisciplinary Project

Module Title	Interdisciplinary Project
Module Number	UA M11
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	2nd semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	10 CP / 300 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	None
Module Examination	Project work, submission period 12 weeks, with presentation, at least 10, at most 20 minutes
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills)</p> <p>Students have the ability to work in a strong interdisciplinary framework integrating knowledge from urban planning, urban design, transport, urban governance and other social, economic and environmental spheres, depending on the project's topic.</p> <p>They have acquired increased technical report writing skills.</p> <p>They have a profound knowledge in mapping, graphing, tabulating and visual work through photographs and other means.</p> <p>Use, application and generation of knowledge (professional and methodical skills)</p> <p>Students are able to carry out guided scientific work and research on a given professional topic, following a sound methodology and with respect to the different technical, social and cultural dimensions of cities and urban agglomerations.</p> <p>They have the capacity to structure and assemble a given assignment.</p> <p>They can utilize quantitative and qualitative approaches to project work.</p> <p>Students have acquired the competences to work individually as well as within interdisciplinary and intercultural teams and projects, to organize individual and group project work, and to finalize the results in a scientific report and project documentation.</p> <p>Communication and cooperation (personal and social competences)</p> <p>Students have acquired group moderation and mediation capacities.</p> <p>They are competent in intercultural communication.</p> <p>Students have a sound practice in project management skills.</p> <p>They are capable to interact with communities through questionnaires and other means and to collect data and necessary information through contact with different administrations and bureaucracies.</p> <p>Scientific self-image and professionalism (personal self-competences)</p> <p>Students have practiced to lead, organize and work in professional groups.</p> <p>They have enhanced presentation skills within the classroom and in front of a public audience.</p>
Module Contents	Interdisciplinary Project
Module Teaching Methods	Seminar, project work in groups
Module Language	English
Module Availability	Summer semester
Module Coordination	Prof. Dr.-Ing. Paola Alfaro d'Alençon
Comments	-

Unit Description

Unit Title	Interdisciplinary Project
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Code	Internal department reference number or code
Module Title	Interdisciplinary Project
Unit Contents	<p>The module entails systematic project work, with an either more theoretical or conceptual weight or a more empirical, practical orientation, partly done in interdisciplinary groups, on selected issues out of the different fields and scales (from the neighborhood to the region) of urban agglomerations.</p> <p>This work includes among others:</p> <ul style="list-style-type: none"> - Context analysis - Formulation of project objectives and intended methodologies - Collection, evaluation and synthesis of quantitative and qualitative information - Finalizing of concepts, conclusions and recommendations - Scientific report and public presentation of the project <p>Mapping and other graphical and visual representations are a key part of project work. Lectures relevant to the chosen project are provided.</p> <p>Whole of class workshops as well as one-to-one guidance in project work are provided.</p>
Teaching Methods	Seminar
Semester Periods (Hours) per Week	4 SWS
Workload (h)	300 h
Class Hours	60 h
Total Time of Examination incl. Preparation (h)	120 h
Total Time of Individual Study (h)	120 h
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	Prof. Dr.-Ing. Paola Alfaro d'Alençon / Dr.-Ing. Susana Restrepo Rico
Recommended Reading	<p>Bentley, I., Alcock, A., Murrain, P., McGlynn, S., and G. Smith (1985) Responsive Environments: A Manual for Designers, Architectural Press, London</p> <p>Booth, W.C., Colomb, G.G. and Williams, J.M. (2008) The Craft of Research. The University of Chicago Press, Chicago & London</p> <p>Hartz-Karp, J. and Marinova, D. (eds.) (2017) Methods for Sustainability Research. Edward Elgar Publishing, Cheltenham</p> <p>Depending on the specific project topics, additional recommended literature is communicated at the beginning of the course.</p>
Type and Form of Assessment	-
Assessment Grading	-
Comments	-

UA M12 International Exchange Course

Module Title	International Exchange Course
Module Number	UA M12
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	3rd semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	30 CP / 900 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	None
Prerequisites for Module Examination	Depending on the requirements at the partner university
Module Examination	Depending on the requirements at the partner university
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills) Students have a broad knowledge and understanding of selected matters and specialized fields of urban agglomerations – such as social-cultural aspects, public participation, project management, sustainable urban and regional development, urban and landscape design, transport planning, infrastructure provision, planning methods and others – depending on the selected master program at one of the international partner universities.</p> <p>Use, application and generation of knowledge (professional and methodical skills) Students are capable to professionally apply the knowledge of selected matters and specialized fields of urban agglomerations – such as social-cultural aspects, public participation, project management, sustainable urban and regional development, urban and landscape design, transport planning, infrastructure provision, planning methods and others – gained at the international partner university.</p> <p>Communication and cooperation (personal and social competences) Students have developed a high level of intercultural reflection and sensibility. They have profound foreign language and professional language abilities.</p> <p>Scientific self-image and professionalism (personal self-competences) Students are aware of diversities and/or similarities of the global development phenomena by exposure to an international socio-cultural and academic environment. They are equipped with intercultural flexibility and knowledge about international network-building.</p>
Module Contents	Studies at a postgraduate level with contents referring to urban agglomerations, depending on the specific lectures, seminars or projects offered at the chosen partner university
Module Teaching Methods	Depending on the courses offered at the partner university
Module Language	English or other, depending on the language of the program at the partner university
Module Availability	Each semester
Module Coordination	Program director / program manager
Comments	-

UA M13 Master Thesis with Colloquium

Module Title	Master Thesis with Colloquium
Module Number	UA M13
Module Code	Module code
Study Program	Urban Agglomerations (M.Sc.)
Applicability of the Module to Other Study Programs	
Module Duration	One semester
Recommended Semester	4th semester
Module Type	Compulsory module
ECTS (CP) / Workload (h)	30 CP / 900 h
Recommended Previous Knowledge	None
Prerequisites for Module Participation	Passed modules: UA M1 UA M2 UA M3 UA M4 UA M5 UA M6 UA M7.1/2 UA M8 UA M9 UA M10 UA M11 UA M12
Prerequisites for Module Examination	UA M1 UA M2 UA M3 UA M4 UA M5 UA M6 UA M7.1/2 UA M8 UA M9 UA M10 UA M11 UA M12
Module Examination	Master Thesis, submission period 18 weeks, with colloquium, at least 40, at most 60 minutes Weighting of the colloquium: 25%
Learning Outcomes and Skills	<p>Knowledge and understanding (professional skills) Students have the ability to develop systematic, substantial and original academic research work. They know how to design and structure a research proposal and to use a set of different research tools.</p> <p>Use, application and generation of knowledge (professional and methodical skills) Students are competent to carry out individual and independent scientific work on a specific topic, applying scientific methods and developing solutions with respect to the different technical, social and cultural dimensions of cities and urban agglomerations. They are capable to synthesize information, build new knowledge and draw conclusions to attain a higher level of understanding Students can systematically apply their academic writing skills. They can utilize quantitative and qualitative approaches to research work.</p> <p>Communication and cooperation (personal and social competences) Students can present and communicate the contents and results of their research work in a structured presentation to a wider audience. They have developed the capacity for critical evaluation and reflected argumentation.</p> <p>Scientific self-image and professionalism (personal self-competences) Students can place and classify the topic and results of their research work in a wider professional context.</p>
Module Contents	Master Thesis
Module Teaching Methods	Individual research work
Module Language	English
Module Availability	Each semester
Module Coordination	Program director / program manager
Comments	-

Unit Description

Unit Title	Master Thesis with Colloquium
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Code	Internal department reference number or code
Module Title	Master Thesis with Colloquium
Unit Contents	<p>The Master Thesis synthesizes the different knowledge gained in the previous modules of "Urban Agglomerations" and proves that the candidate is capable of pursuing a scientific career.</p> <p>It consists of conceiving and writing a thesis and/or developing a conceptual planning study under the supervision of two professors involved in the master program "Urban Agglomerations".</p> <p>One of the supervisors can also be a professor of one of the international partner universities.</p> <p>Each student develops his/her topic independently in consultation with the supervisors.</p> <p>Finally the results are presented in a scientific colloquium.</p>
Teaching Methods	Seminar
Semester Periods (Hours) per Week	0,4 SWS
Workload (h)	900 h
Class Hours (h)	10 h
Total Time of Examination incl. Preparation (h)	890 h
Total Time of Individual Study (h)	-
Total Time of Practical Training (h)	-
Unit Language	English
Lecturer	All professors of the Master Program "Urban Agglomerations"
Recommended Reading	Depending on the topic of the Master Thesis
Type and Form of Assessment	-
Assessment Grading	-
Comments	-