

European Master of Science

Transforming City Regions

Winter Semester 2022/2023 Handbook

Table of Contents

Transforming City Regions Curriculum Framework.....	4
Compulsory Modules	6
Urban Transformation I	8
Planning and Design for Changing Cities	9
Evolving Environment. Transforming Landscapes	10
Multiple Scales of Urban Planning and Design.....	11
Elective compulsory modules	12
Integrated Project I:	14
Integrated Project II:	16
Integrated Project III:	18
Research Module in Urban and Regional Transformation	20
Impromptu Courses	24
Elective Courses.....	26

Transforming City Regions Curriculum Framework

According to RWTH's comprehensive examination regulation
and TCR's examination regulation

Core Courses

Elective Compulsory Courses

Elective Courses

Semester 1

Winter Semester

Semester 2

Summer Semester

Urban transformation II

2SWS / 3CP

Changing societies & economies

2SWS / 3CP

Territorial analysis, digital tools

2SWS / 3CP

European urban policies & territorial governing structures

2SWS / 3CP

Research Module in Urban and Regional Transformation

Semester 3

Winter Semester

Transit

0SWS / 3CP

Semester 4

Summer Semester

Master Thesis Project work and presentation of the thesis

0,5SWS / 30CP



Compulsory Modules

The compulsory modules or core courses focus on dynamics of contemporary cities, the processes shaping the form and structure of cities, and designing tools for urban transformation. The knowledge provided by a multidisciplinary teaching staff provides knowledge, tools, and methodologies to respond to challenges of evolving European territories while being aware of different spatial aspects such as social, economic, and ecological ones.



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そんなひどい...
9.28 Blu-ray & DVD
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Urban Transformation I

Module responsible:

Prof. Dipl.-Ing. Christa Reicher

Teaching staff:

Assoc. Prof. Dr. Maram Tawil

Course content and structure

The module presents dynamics of urban areas in Europe, discusses in this context a new definition of the city and elaborates contemporary processes shaping cities and urban areas: territorial, demographic, socio-economic and environmental. The models explaining the nature and consequences of this change form important part of the module as well as theories aiming at explaining them. The territorial background of the topic of the module stretches to the regional scale and urban networks. The aspects of the urban transformation include mobility patterns, heritage issues and culture of cities, new technologies, social infrastructure and the quality of life.

The objective of the module is to explore and understand dynamics of the processes that can be observed in urban areas with a particular focus on those located in Europe. The students shall be able to apply this knowledge in their projects on real world case studies.



Planning and Design for Changing Cities

Complex Cities, Self-organisation and Planning

Course content and structure

Cities are complex systems that change and adapt over time due to top-down interventions and bottom-up (spontaneous) transformation processes evolving from an uncountable number of actions. This latter process, namely self-organisation, is an unavoidable characteristic of complex systems. Self-organisation generates both risks and benefits in the urban realm. It could produce undesirable social-spatial configurations that must be mitigated and readdressed by planners. Still, it can also determine the emergence of beneficial spontaneous urban dynamics that enable the use of polycentric and dispersed forces in society. In this case, an open-ended space for experimentation guarantees the necessary creative room for innovations and changes otherwise unreachable by merely employing centralised plans and designs. In the last several years, advanced models have been elaborated to understand emergent urban self-organisation processes better. Nevertheless, implications on how to plan and design the framework for the open-ended and adaptive development of cities and neighbourhoods (sometimes also buildings) for uncertain futures are still in their infancy and have hardly penetrated ordinary planning and design practices.

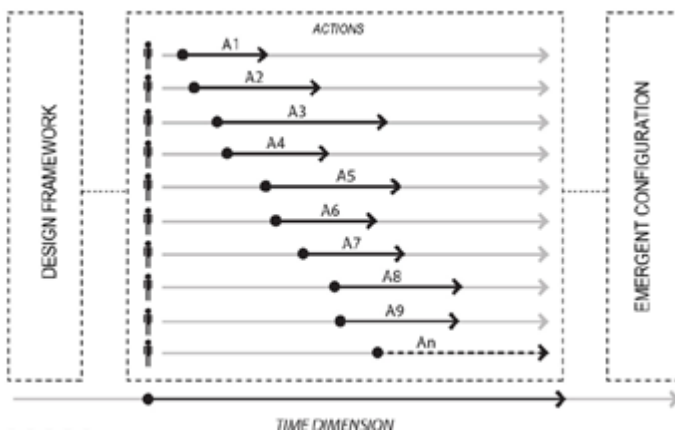
In this course, students will deal with:

- an overview of complexity theories of cities and the main self-organising principles of change (why is the city a complex system? What are the main conditions framing urban self-organisation?)
- the complementarity between design and spontaneity (why do cities evolve in largely unpredictable ways? Why are certain urban areas more adaptable/spontaneous than others?)
- the main ethical and technical aspects connected to these issues (when is a spontaneous social-spatial configuration just or unjust? How is it possible to design/regulate an open-ended future?)

Learning objectives

The main objectives of the course are to:

- introduce an understanding of complexity thinking in the analysis and design of the urban realm;
- explore different kinds of planning and design conditions (such as rules and property rights) framing the long-term evolution of the built environment;
- develop a new methodological design and planning approach that takes into consideration relevant aspects such as time, actions and uncertainty;
- understand the nature of certain spontaneous transformation processes (e.g. distribution of uses, clusterisation of populations, gentrification and self-regeneration processes, etc.);
- discuss certain important ethical questions concerning the interplay between comprehensive plans, justice and individual freedom.



© Cozzolino Stefano (2017). The City as Action. PhD dissertation, Polytechnic University of Milan.

Module responsible:

Prof. Dipl.-Ing. Christa Reicher

Teaching staff:

Dr. Stefano Cozzolino (ILS)

Evolving Environment. Transforming Landscapes

Module responsible:

Prof. Dr.-Ing., Univ. Frank Lohrberg

Teaching staff:

Prof. Dr. Verônica Garcia Donoso

PhD. Candidate Amrita Slatch

Course content and structure

In the course “Evolving Environment – Transforming Landscapes” many aspects of changing the natural environment will be addressed, with special attention to water management and ecological thinking. In the course participants will understand the fundamentals of theoretical concepts to analyze and design the landscape, understood as a changing environment. Key concepts that will be present in this course: environmental planning, land mosaics, green and blue infrastructure, nature based solutions, agro ecological planning, water management. This module has theoretical characteristics, with practical approach.

Learning objectives

The module aims to give students an overview of impacts in the natural environment and tools to plan and think about city regions. This knowledge shall develop their awareness of the concept of sustainability, resilience and risk mitigation strategies in the development of cities and regions.



Multiple Scales of Urban Planning and Design

GIS-Box: Project and Reflection

Course content and structure

This module is part of the GIS-Box, which collects and provides knowledge, resources and tools to visualize and analyze spatial data. In the GIS Project, students will apply their knowledge and skills in mapping specific issues on different spatial scales. What parts of a neighborhood, city, or region are undergoing rapid changes? What is immutable? Mapping physical, functional and procedural dimensions of space will help students to visualize and analyze processes of transformation. The Rhenish lignite mining area will serve as a common spatial point of reference. While much of the content will be for self-study, there will be opportunities to engage in a discourse with peers and scholars. In the end, students will present maps and write essays that showcase both their technical abilities and their collective knowledge of the region.

Students who take this course will have access to other content of the GIS-Box (video lectures and tutorials), even if they are not registered for them.

Module responsible:

Prof. Dr. Agnes Förster (PT)

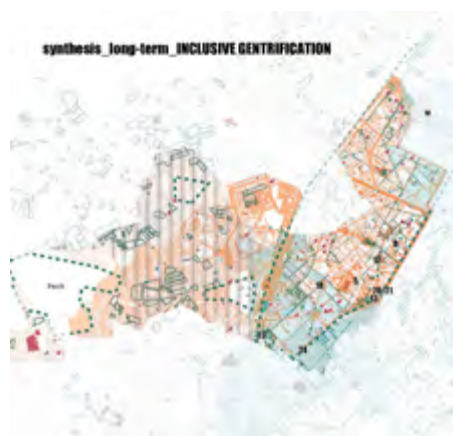
Teaching staff:

Prof. Dr. Agnes Förster (PT)

Martin Bangratz (PT)

Learning objectives

- Understanding processes of transformation on multiple scales
- Finding and managing spatial data
- Using basic functions of the software QGIS



By Amal Al Balushi, Sophie Knoop, Yongwei Li and Stephanie Tanneberger



Elective compulsory modules

The increasing territorial complexity and issues with different structural and content-related priorities and the link with the foundations of other disciplines should lead to integrative and conceptual thinking. The elective compulsory courses are characterised by a broad spectrum of methodological, procedural, morphological, landscape architectural, ecological, legal, and economic aspects.



Integrated Project I:

Heerlen Noord 2.0

Module responsible:

Prof. Dipl.-Ing. Christa Reicher (STB)

Teaching staff:

Nicole Maurer

Marc Maurer

Course content and structure

The municipality of Heerlen in the Netherlands has a long cultural history. It was an important crossroads during Roman times, as well as in the Middle Ages. At the beginning of the 20th century, Heerlen was a village with 6646 inhabitants. During the industrial age the number of inhabitants increased explosively in 30 years to 32.263 inhabitants (and to 95.147 in 2000). This growth was connected to the construction of several and private royal coal mines. In 1965 the mines were closed down by the Dutch government and the factories were demolished. Since then, Heerlen has been characterized by a shrinking demography and many economic and social problems.

Heerlen is the center of the city region Parkstad Limburg, a suburban cluster of 250,000 inhabitants. Social backwardness is particularly prevalent in the northern part of the city. The country, the province, region and the municipality decided to invest in new urban city development by redesigning 'Heerlen Noord'. The first investment was a new railway station and multifunctional quarter 'Maankwartier'. One finds a wildly grown (because it was developed too quickly) district with a patchwork of diverse identity spaces. The following examples demonstrate this: In the neighbourhood Hoensbroek is the most beautiful monumental castle of the Netherlands located (which has been designated as such in this year); in the district 'Woonboulevard', lots of German and Dutch people of the Euregio buy goods at global chain shops like Ikea, and the district 'Zilverzand Groeve' you can find heavy industry and a beautiful post-industrial landscape.

In recent years, Heerlen has experienced an upswing. Shrinkage is decreasing, and with the theme 'urban' it is rebranding itself with young subcultures, such as street art and breakdancing, but also with new designs of public spaces, in which greenery and water are given an important role. During the period of 80's and 90's lots of concrete roads for cars were built. Heerlen Noord deserves a second chance. The city of Heerlen, is convinced that the many potentials and also mistakes made in the past can be revalued/corrected in a new vision that profiles Heerlen with its interesting geographical location as an attractive place to live and work.

Learning objectives

The aim of the module is to equip students with the design and solution-oriented skills that can assist them in redesigning the urban structure at the neighbourhood/district level, which is the easiest to grasp spatially and will therefore help them to identify the very essence of urban dynamics. Students will demonstrate that they are able to conceptualise the problem, analyse a real case study, apply appropriate methods and design techniques, develop scenarios for future transformation and produce designs that can help to implement this scenario. Another aim is to prepare students for teamwork while taking individual responsibility for a specific task. As a result of the module, students should be able to give a convincing public presentation of their project and discuss their solution with the audience.

Reading recommendations

- M. Hermans. 2016. De Anti-Stad. Nai010 Publishers Rotterdam
- M. Hermans. 2022. Patchwork Parkstad Limburg. Nai Publishers Rotterdam
- K.Kerstra, etc 2007. Landschapvisie Zuid-Limburg. Provincie Limburg Maastricht
- Jo Coenen, etc 2015. Handbuch IBA Parkstad Limburg. Iba Parkstad Heerlen
- Kirsten Schipper, Joosje van Geest, Cor Wagenaar. 1999. Jos Klijnen. 01 Publishers Rotterdam



Integrated Project II:

University campus as a living lab: rethinking public space for climate action at university campuses

Module responsible:

Prof. Dipl.-Ing. Christa Reicher (STB)

Teaching staff:

Dr. Ceren Sezer (STB)

Course content and structure

Research, policy and public debates have recognized climate change as an urgent issue to tackle through a systematic action plan. Scientific evidence shows that human behaviour contributes to climate change by using natural sources and producing direct and indirect carbon footprints (UN Nations, 2017). Urban climate challenges are multifaceted and require interdisciplinary and transdisciplinary collaborations to tackle these challenges (Allen-Gil et al 2005; OECD, 2015). Local-scale initiatives can efficiently raise climate change awareness and build communities; capacity for climate resilience action (Reicher and Kemme, 2009; Barnett et al, 2015; Niksic and Sezer, 2017). University campuses may have a high impact on climate resilience as they accommodate various highly educated and skilled communities that are well organized through research and administrative bodies, student organizations, and workers' unions, among others (LealFilho et. al, 2018). Universities are also knowledge hubs well connected with industry and governments (Leal Filho et al. 2018). Universities are potentially able to create long-term strategies and plans (Loorbach, 2010).

There is an increasing number of attempts to develop university-wide strategies and action plans to combat climate change. The IDEA League universities forthcoming report on Sustainability and Climate Action on Campuses (expected in September 2022) highlights several key themes, including eco camps, construction and renovation, energy systems, mobility, food and beverage, procurement and waste management, and digitalization. Despite these extensive efforts on climate action, there are several challenges which limit to realization of the steps in these focus areas: the literature on sustainable development presents that this is because of the complexity of barriers and drivers and the lack of a holistic approach as an alternative to the current compartmentalized methods. Additionally, several initiatives and tools may help to evaluate and measure progress towards sustainable development (Verhoef and Bossert, 2019).

Living Labs are an effective methodology of participation and co-creation for urban transformation (Steen and Bueren, 2017a, b). This module understands Living Labs as ;user-centred, open innovation ecosystems based on systematic user co-creation approach, integration research and innovation process in real life communities and settings (ENoLL, 2016). Although living lab methodology is actively used for collaborative climate action plans at universities, it is very often invisible, unknown to the university community and not widely participated (Verhoef and Bossert, 2019).

This module guide students to develop methods and strategies for impactful living labs to improve climate resilient action at university campuses. It connects knowledge from different fields to tackle the climate emergency and formulate short-, mid-and long-term strategies and action plans for decarbonization of the university campuses. The module focuses on transforming open public spaces at university campuses for heat stress adaptation, mitigation, and active mobility. It facilitates innovative participation and co-creation strategies involving academics, students, artists, the operation community and the city.

Learning goal

This module develops methods and strategies for impactful living labs to improve climate resilient action at university campuses. It connects knowledge from different fields to tackle the climate emergency and formulate short-, mid-and long-term strategies and action plans for decarbonization of the university campuses. The module focuses on transforming open public spaces at university campuses for heat stress adaptation, mitigation, and active mobility. It facilitates innovative participation and co-creation strategies involving academics, students, artists, the operation community and the city.

Learning objectives

- to develop a new insight into the drivers of climate change in the university campus areas using innovative research and methods based on stakeholder engagement;
- to analyze critically existing strategies, regulations, and policies at the university campuses and identify a range of effective practices addressing climate change mitigation,
- to perform climate and microclimate sensing campaigns to map threads and opportunities: sensors, data and networks link the artificial and natural elements of urban environments to connect citizens and decision-makers and to integrate ecological solutions into the built environment.
- to analyze public space types and morphologies at the campus areas
- to develop a climate change mitigation strategy operationalizing a new participatory model for inclusive strategies and action plans based on knowledge co-creation and co-design of solutions with stakeholders at the university level and beyond.
- Translation of strategies to public space interventions.

Reading recommendations

- Allen-Gil, S., Walker, L., Thomas, G., Shevory, T. and Elan, S. (2005), "Forming a community partnership to enhance education in sustainability", *International Journal of Sustainability in Higher Education*, Vol. 6 No. 4, pp. 392-402.
- Chokhachian, A., Santucci, D., Auer, T. (2017) A Human-Centered Approach to Enhance Urban Resilience, Implications and Application to Improve Outdoor Comfort in Dense Urban Spaces. *Buildings* 2017/7, p. 113.
- Dobbela, A. V. D. (2021). The Regenerative City: Positive Opportunities of Coupling Urban Energy Transition with Added Values to People and Environment. In *TransFEWmation: Towards Design-led Food-Energy-Water Systems for Future Urbanization* (pp. 235-252). Springer, Cham.
- European Commission. (2016). What is the Urban Agenda for the EU?
- Reicher, C., Kemme, T. (2009) *Der öffentliche Raum: ideen-konzepte-projekte* (2009). Jovis:Germany.
- Juraschek, M., Vossen, B., Hoffschroer, H., Reicher, C. (2018) *Urbane produktion: ökotone als analogie für eine nachhaltige Werschöpfung in Städten*, *Interdisziplinäre Perspektiven zur Zukunft der Werschöpfung*, 195-207.
- LealFilho, W., Raath, S., Lazzarini, B., Vargas, V.R., deSouza, L., Anholon, R., Quelhas,
- O.L.G., Haddad, R., Klavins, M. and Orlovic, V.L. (2018), "The role of transformation in learning and education for sustainability", *Journal of Cleaner Production*, Vol. 199, pp. 286-295.
- Loorbach, D. (2010). Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. *Governance: An International Journal of Policy, Administration, and Institutions*, 23(2), 161-183. Loorbach, D.,
- Frantzeskaki, N., & Avelino, F. (2017). Sustainability Transitions Research: Transforming Science and Practice for Societal Change. *Annual Review of Environment and Resources*, 42(1), 4.1- 4.28.

Integrated Project III:

Rhine Alpine corridor

Module responsible:

Prof. Dipl.-Ing. Christa Reicher (STB)

Teaching staff:

Assoc. Prof. Dr. Maram Tawil

Canan Çelik

Prof. Dr. Verônica Garcia Donoso

Course content

Within the Rhine Alpine corridor, the most densely urbanized area in Northwest to North-south Europe and a highly interconnected territory exists. The project aims to revive the spirit of brave urban utopias and superstructures from the past and translate that thinking into modern times and challenges of transformation, connectivity, and cross-border development.

The Rhine Alpine Corridor stretches from the Netherlands, to Belgium, Germany, Luxembourg, France, Switzerland to Italy. The main focus of the corridor is connected to the rail infrastructure.

The goal of the project is to create a vision of a “Connected Rhine Alpine Corridor” from Netherlands to Italy. Asking what would happen if this entire region became one fully connected artery in Europe. The participants will be urged to work strategically towards social, economic and cultural nodes and zones, while thinking about the meaning of borders. From the megaregion scale the project will focus on the creation of thematically appropriate systems within an all-connecting linear superstructure. In the final step, focal points will be detailed, providing zoom-in spots for a better understanding of the structure.

Learning goal

The goal of the project is to create a vision of a “Connected Rhine Alpine Corridor” from Netherlands to Italy. Asking what would happen if this entire region became one fully connected artery in Europe. The participants will be urged to work strategically towards social, economic and cultural nodes and zones, while thinking about the meaning of borders. From the megaregion scale, the project will focus on the creation of thematically appropriate systems within an all-connecting linear superstructure. In the final step, focal points will be detailed, providing zoom-in spots for a better understanding of the structure.

Learning objectives

At the end of the course students would be able to develop and manage a design and solution-oriented project of a multiregional scale. The students will achieve to understand transformation processes on from a city scale to cross border content and its economic and social impact for the full region. The students will demonstrate that they can work in groups and are able to analyse current situations, develop visions and scenarios to make a full project proposal on a defined challenge. The students will work in teams to develop their soft skills in communication, design thinking and public presentation and discussion.

Reading recommendations

- Allen-Gil, S., Walker, L., Thomas, G., Shevory, T. and Elan, S. (2005), “Forming a community partnership to enhance education in sustainability”, *International Journal of Sustainability in Higher Education*, Vol. 6 No. 4, pp. 392-402.
- Chokhachian, A., Santucci, D., Auer, T. (2017) A Human-Centered Approach to Enhance Urban Resilience, Implications and Application to Improve Outdoor Comfort in Dense Urban Spaces. *Buildings* 2017/7, p. 113.
- Dobbelseen, A. V. D. (2021). The Regenerative City: Positive Opportunities of Coupling Urban Energy Transition with Added Values to People and Environment. In *TransFEWmation: Towards Design-led Food-Energy-Water Systems for Future Urbanization* (pp. 235-252). Springer, Cham.
- European Commission. (2016). What is the Urban Agenda for the EU?
- Reicher, C., Kemme, T. (2009) *Der öffentliche Raum: ideen-konzepte-projekte* (2009). Jovis:Germany.
- Juraschek, M, Vossen, B. Hoffschröer, H, Reicher, C. (2018) *Urbane produktion: ökotone als analogie für eine nachhaltige Werschöpfung in Städten*, *Interdisziplinäre*

Perspectiven zur Zukunft der Wertschöpfung, 195-207.

- LealFilho, W., Raath, S., Lazzarini, B., Vargas, V.R., deSouza, L., Anholon, R., Quelhas,
- O.L.G., Haddad, R., Klavins, M. and Orlovic, V.L. (2018), "The role of transformation in learning and education for sustainability", *Journal of Cleaner Production*, Vol. 199, pp. 286-295.
- Loorbach, D. (2010). Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. *Governance: An International Journal of Policy, Administration, and Institutions*, 23(2), 161-183. Loorbach, D.,
- Frantzeskaki, N., & Avelino, F. (2017). Sustainability Transitions Research: Transforming Science and Practice for Societal Change. *Annual Review of Environment and Resources*, 42(1), 4.1- 4.28.



Research Module in Urban and Regional Transformation

Sustainability in Historical Architecture and Urban Design (Eng.)

Module responsible:

Univ.-Prof. Dr.-Ing. Christian Raabe

Teaching staff:

Dr. Mina Hajian

Course content and structure

This course, led by Dr. Mina Hajian, seeks to study sustainable design methods in historical buildings and contexts and will conclude with suggestions for sustainable design.

Climate change and the energy crisis in the world are increasingly driving the need for sustainable design.

Making use of past experiences in the way we have dealt with environmental problems due to the lack of access to active methods of providing thermal comfort will allow us to find passive solutions to climate problems.

Iran's rich architectural heritage and multiple climates make it an ideal place to study various sustainable design solutions. Historically, the inhabitants of these regions used different design methods due to the simultaneous existence of cold and hot regions as well as dry and humid climates in this wide area.

Places are allocated via the central faculty registration procedure in RWTH online. Place acceptance of the allocated places until 10.10.2022 via email to kerner@denkmal.arch.rwth-aachen.de.

Thursdays at 10:00

Expected to start on 27 October

in the Department of Conservation and Historic Building Research



Urban Stories

Course content and structure

The inner city seems to be in a fundamental functional crisis, which has become even more apparent through the Corona pandemic. In this research field we will exemplarily look at gastronomy as an important economic, cultural, social use in the city centre. The entire sector is suffering particularly from Corona-related restrictions and the effects of the Ukraine war.

We will test and reflect on qualitative research methods (including observation, interviews and storytelling) and use them to capture the reality of gastronomy in its diversity and to communicate its functional and spatial qualities through stories (urban stories).

The seminar will alternate between professional inputs, working sessions and fieldwork on site. We will proceed in four steps and create intermediate products in each case:

- 1 Content and methodological introduction (textbook),
- 2 Concept development (script),
- 3 Survey (logbook),
- 4 Urban Story/Essay (picture book).

We cooperate with the pilot project ACademie for Collaborative Urban Development, which is funded within the framework of the National Urban Development.

Module responsible:

Prof. Dr. Agnes Förster (PT)

Teaching staff:

Gisela Schmitt

Urban planning in urban heritage

Module responsible:

Prof. Dipl.-Ing. Christa Reicher (STB)

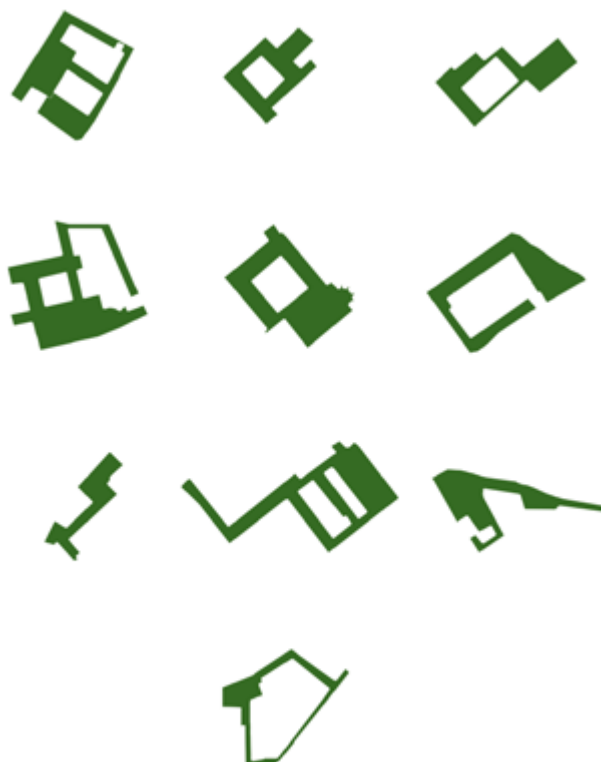
Teaching staff:

Javier Ostos-Prieto (STB)

Course content and structure

The urban development of European cities is linked to the emergence of monasteries. During the Middle Ages, religious orders spread occupying not only the territory, but especially the city. In central Europe, in what is now Germany, monasteries developed significantly. Cities such as Cologne or Aachen had more than 60 and 30 monastic buildings, respectively. Aachen stands out as not only the second monastery town in North Rhine-Westphalia but also as other important facts. It was the capital of the Carolingian Empire, one of the points on the Pilgrim's Way to Santiago de Compostela, and later as a border town of the Holy Roman Empire. The monasteries in the city are not only religious facilities, but also educational, health and even inns. The centrality of Aachen, together with the general lack of a public school, hospital, or hospice system, meant that these functions were taken over by the religious orders in the monastic buildings. Monasteries and convents are not only a reflection of urban importance, but also mark future urban growth. The city of Aachen is shown to be a remarkable example of monastic development in the European city.

The main objective is to familiarise the student with the tools of urban planning for the analysis and protection of urban heritage. Through the morphological study of monastic buildings in Aachen, the student should develop his own criteria and handle a methodology that will enable him to work professionally in heritage in the future. A morphological analysis of different monastic buildings as well as urban and heritage characteristics will be studied. In addition, proposals for heritage protection will be made in relation to the development of the building in its urban context



Ecological Planning for the Amazon Region

Course content and structure

Vegetation areas provide relevant ecosystem services and have been under intense human pressure in recent decades. This course subject is the Brazilian Amazon region, with case study in Porto Velho-RO. We will understand the conversion of natural vegetation areas for urbanization in two scales, regional and urban, and develop guidelines for future ecological planning.

This course uses the GIS application to model data for spatial analysis. The goal is to understand the undergoing changes in the Amazon region and specially in Porto Velho-RO. The participants will organize creative maps and graphs of the transformation process. The module shall give the participants an overview of the Amazon region – natural environment, impacts and ecological global importance – and also support the ecological planning of the Porto Velho city and region with maps and other graphical information. The assignment for this module is to create the material (maps, graphics and analysis) for the workshop to be held in Porto Velho, Brazil, in March 2023. Participants may attend at the workshop on their own organization. Also, the most dedicated students will be invited to participate on a peer-review publication.

Learning objectives

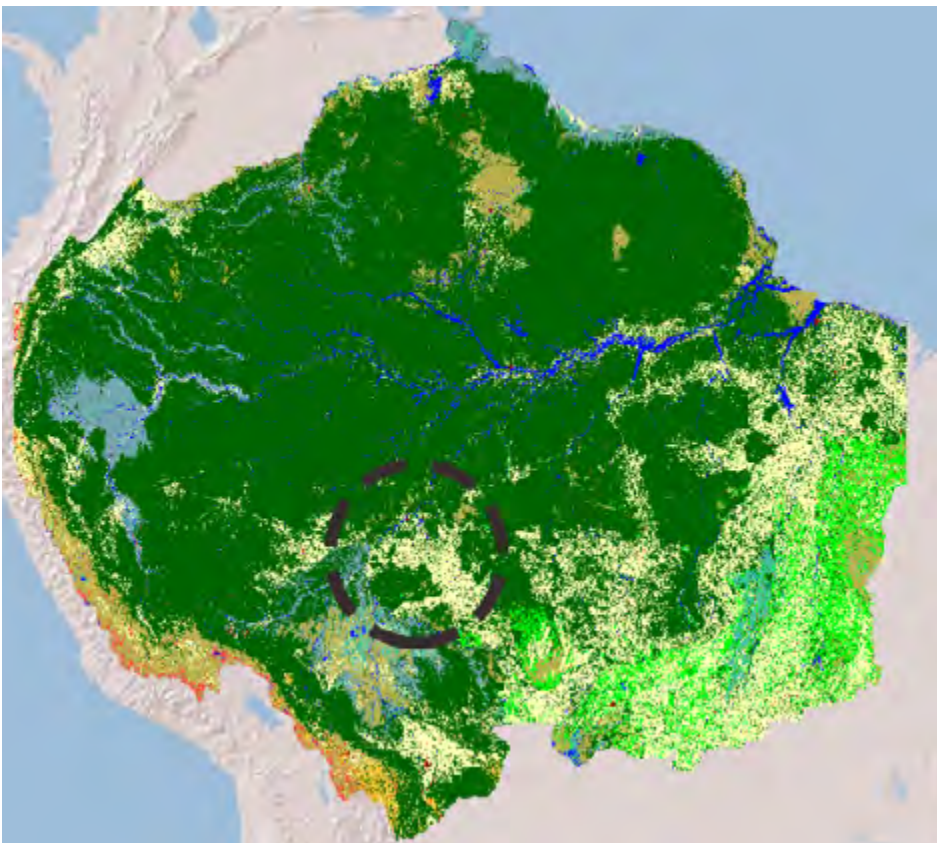
The module aims giving insights about the challenges on the Amazon region. The students will develop ecological planning skills and critical thinking. Also, participants will be working with GIS software. Many topics will be address, and the key issues are deforestation, urban growth and conscious planning. Interdisciplinary teamwork is encouraged.

Module responsible:

Prof. Dipl.-Ing. Christa Reicher (STB)

Teaching staff:

Prof. Dr. Verônica Garcia Donoso



Impromptu Courses

Pt.Talks - International and interdisciplinary perspectives on discourses methods

Module responsible:

Prof. Dr. Agnes Förster (PT)

Teaching staff:

Robin Chang

Course content and structure

The aim of this Stegreif / Impromptu Course is to engage in meaningful conversations about various topics in the area of planning theory and urban development with young scholars from a range of international institutions and disciplines. Participants will be invited to attend three Pt.talks, a new event series by Pt with the aim to foster a scientific and public discourse about current and emerging critical topics in urbanism. Within the guiding theme of global challenges for sustainable urban development, we see this format as an opportunity to explore new areas of research from different perspectives.

Each talk will feature a young researcher giving a talk on a specific topic and provide for informal, open discussion among all guests. The format can give students an opportunity to network across thematic and geographical boundaries, exchange feedback, and be inspired by new inputs and discussions.

Students attending this Stegreif will produce summaries of each talk, supplementing their own conclusions by relating them to each other and to general topics of planning theory.

Temporary University Hambach

The region around the Hambach opencast mine is undergoing profound change. In addition to the long-term perspective of phasing out coal and shaping the post-mining landscape, it is important to give the people around Hambach prospects for the future tomorrow. The numerous crises require creative responses in a timely manner. To this end, a culture of joint learning, discussion and development - across disciplines - must be established.

The Temporary University Hambach (TUH) is an experimental learning format that will be realised in Morschenich in the summer semester of 2023. It is aimed at RWTH students and stakeholders from the region.

The Stegreif serves to prepare the TUH in the summer semester. Which places and (experiential) spaces, which learning and research formats will bring the TUH to life? During an all-day workshop in the Reiff Foyer, the students will concretise the concept of the TUH together with actors from the region. The creativity method Future Synthesizer@REVIERa is used for this. The students will work up the workshop results graphically and in text form.

Module responsible:

Prof. Dr. Agnes Förster (PT)

Teaching staff:

Victoria Johann

Katja Schotte

Cooperation mit Neuland Hambach



Elective Courses

The elective courses supported by a multidisciplinary teaching staff are characterised by a broad spectrum of methodological, procedural, morphological, landscape architectural, ecological, legal, and economic aspects.



Elective Modules

GIS-Box: Theory - Mapping Transformation

Module responsible:

Prof. Agnes Förster (PT)

Teaching staff:

Martin Bangratz (PT)

Prof. Agnes Förster (PT)

Course content and structure

This module is part of the GIS-Box, which collects and provides knowledge, resources and tools to visualize and analyze spatial data. In the Theory Module, students will be introduced to various concepts connected to understanding, mapping and analyzing spatial transformation. Inputs include video lectures by multidisciplinary experts on conceptions of space, social space analysis, urban morphology, city trends, and more. Students will have the opportunity to view the content independently and complete the course with an online exam.

Students who take this course will have access to other content of the GIS-Box (video lectures and tutorials), even if they are not registered for them.

Learning objectives

- Understanding spatial concepts and how to think and communicate ideas about space
- Appreciating the interdisciplinary nature of spatial research and professions

GIS-Box Modules (not required, but connected through a common Moodle space):

GIS-Box: Theory

Data Factory

GIS-Box: Project



GIS-Box: GIS Basics - Mapping Transformation

Course content and structure

This module is part of the GIS-Box, which collects and provides knowledge, resources and tools to visualize and analyze spatial data. In the GIS Basics, students will get theoretical and practical introductions to a number of concepts and tools that are relevant to mapping and spatial analysis. This includes map projections, satellite images, elevation models, and connectivity analyses. Students will complete tutorials, short exercises and produce maps using QGIS, an open source software that can be used to visualize and analyze geospatial data. Video tutorials will teach you to select, display and style data. Specifically, you will produce your own maps of a city or region in order to develop and share an understanding of the space. The inner city of Aachen will serve as a common spatial point of reference, with its multiple connections to different levels of scale. Students who take this course will have access to other content of the GIS-Box (video lectures and tutorials), even if they are not registered for them.

Learning objectives

- Understanding the practical uses and potential of spatial data for urban planning, infrastructure planning, urban sociology and many other fields
- Technical know-how of QGIS and geospatial (open) data
- New conceptions of urban space and how to visualize it

GIS-Box Modules (not required, but connected through a common Moodle space):

GIS-Box: Theory

Data Factory

GIS-Box: Project

Module responsible:

Prof. Agnes Förster (PT)

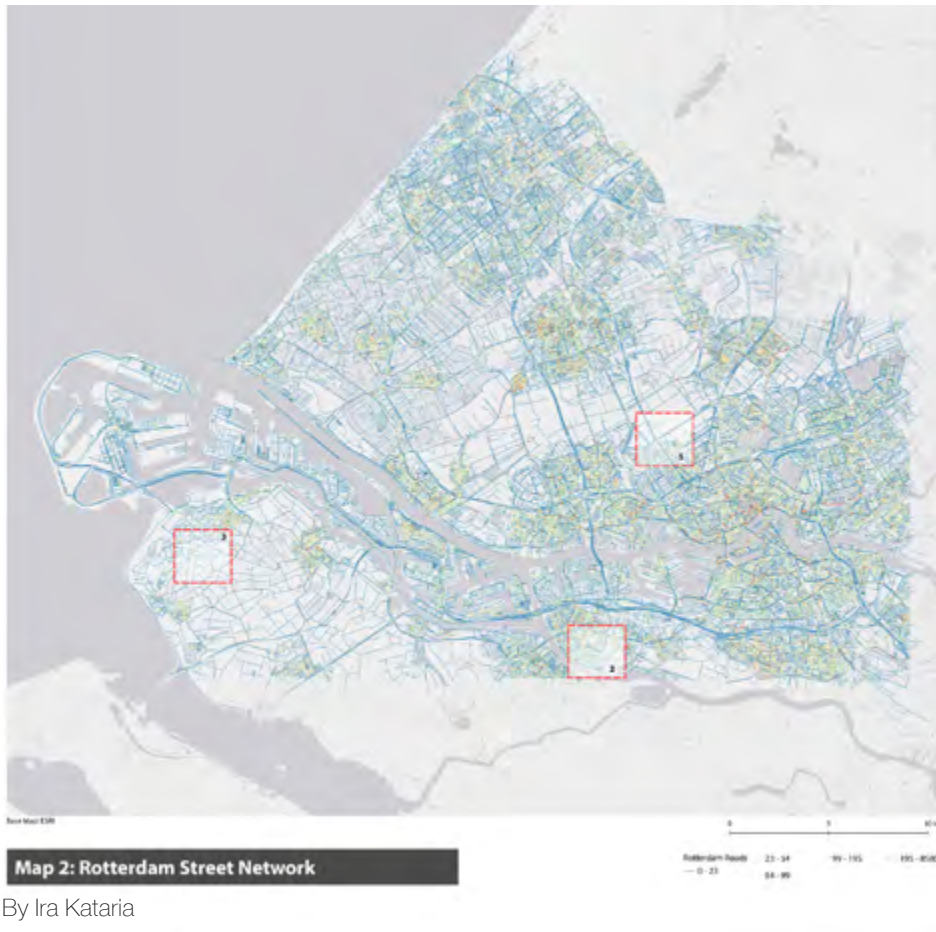
Teaching staff:

Dr. Georg Strauch (GEO)

Maddalena Iovene (PT)

Marcel Porschen (ISB)

Martin Bangratz (PT)



Ecosystem Services and Climate Change

Module responsible:

Univ.-Prof. Dr. rer. nat. Michael Leuchner

Course content and structure

Increasing temperatures, more extreme events, growing pressure on ecosystems and loss of biodiversity are some of the most urgent societal challenges. Healthy, adapted and resilient ecosystems play an important role in providing many supporting, provisional, regulating and cultural services. Important services are climate regulation, water cycling, biodiversity and a clean environment amongst many others. This course focuses on current developments in landscape ecology, ecological climatology and ecohydrology with special focus on ecosystem services and the impacts of climate change in rural and urban areas.

The course

- provides theoretical concepts and insights into ecosystem services, landscape ecology and ecological climatology and hydrology,
- includes current aspects of climate and global change,
- discusses topics such as the interaction of vegetation and climate (on stand, landscape and global level), interactions, coupling and feedbacks between the land surface and the atmosphere, surface energy and mass fluxes, tipping points and extreme events,
- focuses on supporting and regulating ecosystem services such as climate and water regulation, primary production and nutrient cycling,
- looks at different spatiotemporal scales,
- contains applied examples from recent research projects.

The main course language is English to improve foreign language competence for German and international students, however, there will be no disadvantage due to language skills during the course or in the exam. As discussions during the course are encouraged, both English and German are possible working languages.

Individualized Construction

BIM - Building Information Modeling - refers to a methodology for optimizing the planning, execution and operation of buildings with the aid of a digital building model in which geometric and semantic information is stored.

This course teaches the basics of Autodesk Revit, one of the market leading BIM modeling solutions. In order to learn the software's basic functionalities, video tutorials and datasets for training are provided to the participants. To help with the independent learning, semi-weekly consultations are offered. In addition, advanced topics in BIM will be presented and can be optionally further implemented in the BIM modeling workflow.

At the end of the course, a final exercise in form of a modeling Task is worked on over several weeks. Model and Plans must be submitted via upload.

Module responsible:

Prof. Dr. Sigrid Brell-Cokcan (IP)

Teaching staff:

Lukas Kirner (IP)

Participants should already have general experience in using CAD software.

Learning objectives

- Obtain basic knowledge of the operation of Autodesk Revit.
- Create and edit BIM models
- Learn about advanced BIM techniques and Topics

Visual Programming Basics

Module responsible:

Prof. Dr. Sigrid Brell-Cokcan (IP)

Teaching staff:

Martin von Hilchen (IP)

Visual programming has become a powerful tool in the architect's toolbox. It combines the power of programming with an intuitive and direct visual appearance. Architects can use it in all design phases from the initial idea to full-scale construction. Easily adjustable input parameters make it easy to test variants and generate alternatives, e.g. by simply moving a slider.

This course teaches the basics of Grasshopper, a visual programming plugin for McNeel's Rhinoceros software. In addition to explaining how the software works and how to use it, weekly examples and video tutorials will be used to show how to apply it to various project work. The core contents will be worked out independently with the help of the video tutorials and the acquired knowledge will be consolidated by means of weekly exercises and quizzes. During the weekly sessions, solutions are discussed, further content is presented, and helpful tips are given for the next week's exercise. At the end of the course, a final exercise is worked on over several weeks and submitted via upload.

Prior knowledge of Rhinoceros and Grasshopper is helpful, but not explicitly required.

Participants should already have general experience in using CAD programs.

Learning objectives

- Obtain basic knowledge of the operation of Rhinoceros and Grasshopper.
- create and edit parametric models
- create simple variants through parametric design

Advanced Visual Programming

Advanced Visual Programming is a design oriented course exploring computational engineering. The goal of the course is to achieve an advanced understanding of how technology can empower design exploration, analysis and optimization in Architecture Engineering and Construction.

This course teaches advanced skills in Rhino and Grasshopper, exploring plug ins and processes in the creation of parametric models. Topics range from design diagrams, to algorithmic modelling and from structural analysis to optimization. Participants will learn computational processes for fabrication, visualization and documentation. From an initial context and set of constraints participants will work throughout the semester to develop a computational concept and design report that leverages the power of visual programming.

Courses are comprised of lectures, tutorials, and workshops. The examination format is a final report and accompanying files.

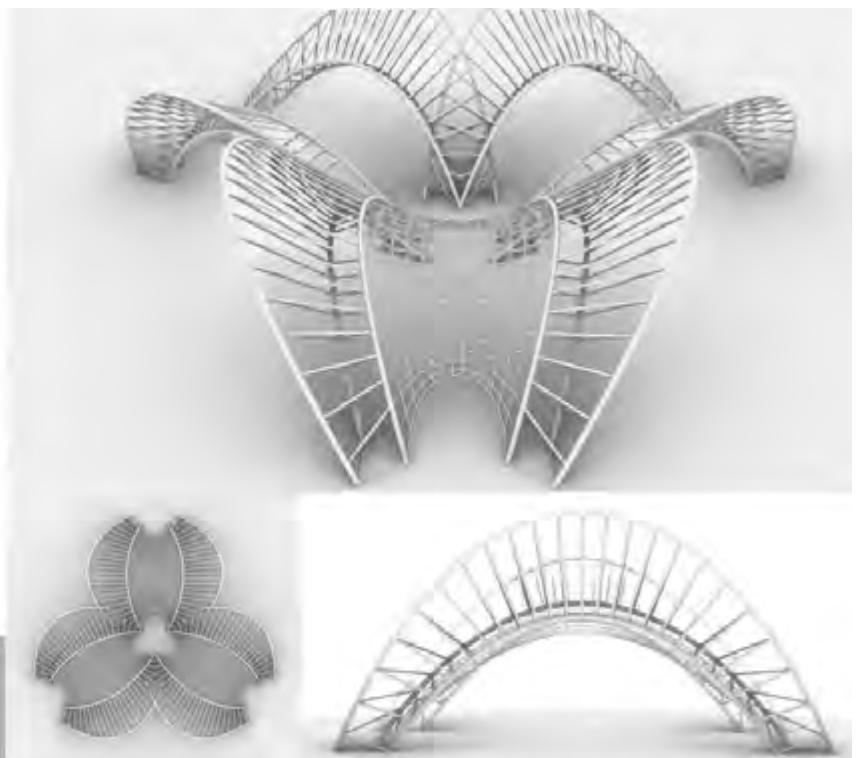
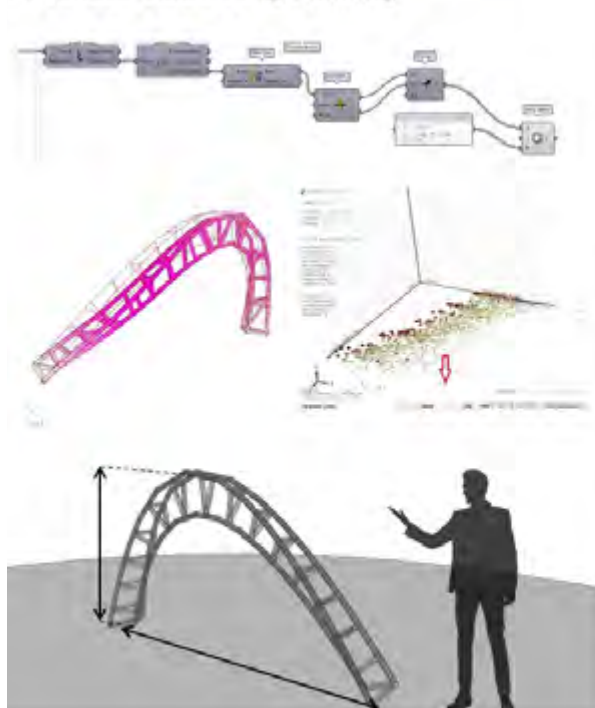
This advanced course requires the completion of the course:
Visual Programming Basics

Learning objectives

Plugins utilized include:

- Karamba (structural analysis)
- Octopus (evolutionary optimization)
- Horster (animation)
- Fologram (augmented reality)
- RhinoInside (Revit Interoperability)

Advanced Visual Programming



Module responsible:

Prof. Dr. Sigrid Brell-Cokcan (IP)

Teaching staff:

Ethan Kerber (IP)

contact

RWTH Aachen University
Faculty of Architecture
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