Regional Geography, 8 CP

170033   **Regional Geography: Stockholm – Urban greening concepts in the fastest growing city in Europe**
Seminar   Registration online, 13-17 Dec 2021 (via website "Studinews")   Inostroza, Luis
                                                                                                           Adem Esmail, Blal

Description::

Preliminary meeting: 06 April 2022, 10:00-12:00
Preparatory seminar: 2-day block 29-30 June or 6-7 July, by arrangement, 10:00-16:00
Excursion: At least 6 days during mid-July to end-September

SoSe 22: Regional Geography Stockholm – Urban greening concepts in the fastest growing city in Europe		
Course ID 170033	**Time, place** Preliminary meeting: 06 April 2022, 10:00-12:00, Room tbd Preparatory seminar: 2-day block 29-30 June or 6-7 July, by arrangement, 10:00-16:00, Room tbd Excursion: At least 6 days during mid-July to end-September, tbd	**Lecturer** Dr. Blal Adem Esmail PD. Dr. Luis Inostroza
Course type Seminar and one-week excursion	**Registration** Registration from 13.12.-17.12.2021 via internet on GI page ("News")	**Form of Examination** Presentation and group report
Prerequisites Successful completion of the "Introduction to Scientific Work". Costs: 450 Euros		
Target group BSc and BA students with a broad interest in environmental planning in metropolitan regions: both physical-geographical and human-geographical topics will be covered in this course.		
Goals After successfully participating in the seminars and excursion, students will have: - gained an understanding of different urban greening concepts, such as nature-based solutions, green infrastructure, ecosystem services, etc., and of the challenges in making them operational to support sustainable planning in metropolitan regions;		

- gained an overview of the Swedish spatial planning system highlighting the interaction of processes, actors and tools across planning levels to support the integration of different urban greening concepts in Stockholm's metropolitan regions;

- developed first-hand insights into a range of projects that integrate the planning and implementation of greening concepts at different scales in the Stockholm metropolitan region.

- enjoyed the possibility to present their work to, and to interact with local actors from academia and practice involved in the planning and implementation of different urban greening concepts in the Stockholm metropolitan region.

Contents

Focusing on one of the fastest growing metropolitan regions in Europe, the course addresses emerging urban greening concepts, such as nature-based solutions, green infrastructure and ecosystem services, and in particular the challenges in their operation to support sustainable planning. The preparatory seminars will consist of two parts: (i) a comparative analysis of the Swedish versus the German spatial planning system, (ii) a review of scientific and gray literature reporting on the application of urban greening concepts in the context of the Stockholm metropolitan region.

The excursion will include site visits to at least four projects (ongoing and already implemented) that integrate the planning and implementation of different urban greening concepts at different scales (from streescape to entire city districts) and contexts (from the city center to rural peri-urban). In addition, opportunities will be created to interact with different knowledge/stakeholders involved in the research and planning of urban greening concepts in the Stockholm Metropolitan Region.

Structure

It consists of a preliminary meeting (6 April), a two-day block seminar (29-30 June or 6-7 July), and 6-days excursion (mid-July to end-September). A two-day block seminar will take place in the end of June or beginning of July as an excursion preparation seminar. The date will be set at the preliminary meeting. The seminar will start at 10 a.m. and end at 4 p.m. in room tbd. For logical reasons, participation is compulsory.

The participants will present a paper (20 minutes lecture + abstract/handout; no written elaboration), which will be discussed afterwards. The focus of the presentation will be on two topics: (i) comparative analysis of Swedish vs German Planning Systems and (ii) application of urban greening concept in Stockholm region.

Accommodation:

Stockholm: tbd.

Start of excursion:

Meeting point at Stockholm Central Station on date tbd. at 13:00.

End of excursion:

Exact date tbd approx. 13:00 pm at Stockholm Central Station.

Please note: If you book a return flight, no departure time from Stockholm before 16.00 will be considered.

Performance requirements:

- active participation and collaboration in the excursion and preparatory seminar

- two short presentations: preparatory seminar and during the excursion

- Excursion report   (4000 words; contents of the excursion must be explained in accordance with its course; deadline for submission: Beginning of May 2022)

Literature

Topic-specific literature will be announced at the respective sessions.

Bachelor (Elective Modules, 6 CP)

170120a	**Introduction to programming and applied statistics**	
	Seminar Mon 10-12 am IA 1/131 First session: 11.04.	Sismanidis,
	Registration online, 13-17 Dec 2021 (via website "Studinews")	Panagiotis

170120b	**Introduction to programming and applied statistics**	
	Seminar Thu 2-4 pm IA 1/131 First session: 14.04	Sismanidis,
	Registration online, 13-17 Dec 2021 (via website "Studinews")	Panagiotis

SoSe 2022: Introduction to Programming and Applied Statistics		
Course ID 170120a+b	**Time, Place** Präsenz a) Mon 10-12 am b) Thu 2-4 pm	**Lecturer** Panagiotis Sismanidis
Course type Seminar	**Registration** Anmeldung vom 13.-17.12.2021 internetgestützt über GI-Seite ("Aktuelles")	**Form of Examination** Final Project

Prerequisites
Basic knowledge in statistics.

Target Group
Undergraduate students without any prior experience in programming using python. Students who want to specialise in climatology are strongly recommended to take this course!

Ziele
- Basic knowledge about fundamental methods in sciences
- Acquire programming skills in core Python 3.
- Identify and manipulate Python objects.
- Writing effective python scripts that are consistent and easy-to-read.
- Open, read, process, analyze and write data using Python and Pandas.
- Designing clear and effective data visualizations using Python.

Goals

This course consists of two parts. The first introduces the students to the fundamentals of the Python language and the second to data analysis and visualization with Python.

First Part:
- Introduction to the fundamentals of the Python language (built-in datatypes and functions, import statements, python environments etc.)
- Flow control using conditional statements and loops.
- Definition of functions in Python.
- Working with datetimes.
- Opening, reading, and writing files using python.

Second Part:
- Analysis of different research datasets from physical geography
- Introduction to the Pandas Data Analysis Library.
- Working with arrays using the NumPy Module.
- Visualizing data using Matplotlib.

Structure

The course consists of 12 lectures, 8 of which are dedicated to introducing the fundamentals of Python and 4 to data analysis and visualization. Each lecture includes a set of compulsory assignments. To complete this course the students, must prepare a final project that includes several programming tasks.

Literature

1. The Python Tutorial: https://docs.python.org/3/tutorial/
2. Python documentation: https://docs.python.org/3.7/
3. The Coder's Apprentice: Learning programming with Python 3 (Free Ebook): http://www.spronck.net/pythonbook/pythonbook.pdf

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170138 Spationomy 2.0

Seminar   Registration via carsten.juergens(at)rub(dot)de

Jürgens, Carsten
Moos, Nicolai
Redecker,
Andreas. P.

Description:

6 participants
Block seminar: 02 - 10 Nov 2022 in Olomouc, CZ

SoSe 2022:

Spationomy 2.0: Spatial and Economic Science in Higher Education - Addressing the Playful Potential of Simulation Games
(ERASMUS+ Kurs in Englisch, Zielgruppe B.A./B.Sc. ab 4. Semester, Wahlbereich)

Course ID	Time, Place	Lecturer

170138	Vorbesprechung:
	    TBA
	Virtual Lectures:
	    Aug/Sept/Okt 2022
	Projektarbeit:
	    Aug/Sept/Okt 2022
	Summerschool:
	    02.-10.11.2022
	    (Olomouc, CZ)
		Jürgens
		Moos
		Redecker

Course type	Registration	Form of Examination
Virtual Seminar, Summerschool	Anmeldung vom 13.-17.12.2021 internetgestützt über GI-Seite ("Aktuelles") *UND* Bewerbung an carsten.juergens@rub.de	Project work

Prerequisites

Bachelor ab 4. Semester, gute Englisch-Kenntnisse, persönliches Interesse

Adequate English language skills and students' personal motivation are prerequisites for participation in this course

Target Group

Wahlpflichtmodul B.Sc. und B.A. ab 4. Semester und M.Sc.

Ziele

The seminar provides an insight into the basics of spatial data processing, economics and game theory.

Students acquire knowledge in the application of geo-information systems for spatial economic issues and subsequently implement this knowledge in a round for a 'Simulation Game'.

Students participate in internationally courses with participants from Germany, the Czech Republic, Slovenia and the Netherlands. They work in international teams.

Goals

We all know that the learning process is easier if it contains playful features. It is then more pleasant to acquire new knowledge and mastering our skills. Simulation game-based learning appears to be more playful and experiential compared to traditional teaching.

This project aims to innovate the way of teaching about the distinct field of economics, business, geoinformatics and geography, all encompassed by game studies, via modern methods of informal teaching (gamification and playful education) and virtual telecollaborative techniques. The project tackles the issue of learning-by-doing by playing a serious and scientifically based simulation game. This game-based learning transforms traditional means of higher education classes into innovative, creative learning environments in which all participants (teachers and students) will be engaged in solving real-world issues through gaming scenarios.

The project also aims to share best practice across disciplinary and national boundaries. The project will encourage to develop deep interdisciplinary cooperation and research sharing among the involved institutions in the field of geoinformatics/geography, economics/business and game studies. This unique combination will be accompanied by the idea of bringing more spatial and economic science into the gaming domain by tackling the issue of "lacking science and real-world situations in educational games." During the blended mobility, students will learn and adopt joint methodologies/techniques/tools and they serve as actors in "spatial economic/business analytics games", deployed to structure group-based and student-led investigations of advanced spatial economic data analyses. Students will be enrolled in the process to think, use, write and talk about their experiences. The project will entail more attractive and relevant pedagogy than lecture or seminar based approaches.

Weitere Infos unter https://spationomy.mvso.cz/2.0/

Selection procedure:

To participate in the course, students must register for the course and submit an individual application during the Geography Department's election week (Dec. 13-17, 2021). Applications will be accepted in the form of a PDF file as of now by email. These should include the following documents:

• Motivation Letter
• curriculum vitae
• Information of studies progress (Transcript of Records, if necessary supplemented by modules whose evaluation is still pending). Application deadline is 17.12.2021 at 23.59. Applications should be

sent to: Prof. Dr. Carsten Jürgens (carsten.juergens@rub.de)
Structure Preliminary meeting, 3 Virtual Lessons, Projektarbeit, Summerschool
Literature Anselin L. 1988. Spatial Econometrics: Methods and Models, Kluwer Academic Publishers, Dord[...] Netherlands. Bernanke, B S., Frank, R. 2008. Principles of Macroeconomics. 4th Edition, Praha: Grada Publishing, 576 p, McGraw-Hill Higher Education. Clark, G. L., Gertler, M. S., & Feldman, M. P. 2003. The Oxford handbook of economic geography. Oxford University Press. Fujita, M., Krugman, P. and Venables, A. 1999. The Spatial Economy: Cities, Regions, and International Trade. Cambridge, MA: MIT Press. Pászto, Vit; Jürgens Carsten; Tominc, Polona & Burian, Jaroslav (Eds.) 2020: SPATIONOMY - Spatial Exploration of Economic Data and Methods of Interdiscyplinary Analytics. Springer Textbook, Cham, doi.org/10.1007/978-3-030-26626-4

170139	**DigiGeo**		
	Seminar 3 SWS	Registration via carsten.juergens(at)rub(dot)de	*Jürgens, Carsten* *Moos, Nicolai* *Redecker,* *Andreas.P.*
	Description:		
	4 participants Block seminar: 24 - 29 Apr 2022 in Olomouc, CZ		

SoSe 22:

DigiGeo:Transferring contact, technology- and field-based education to digital: methods and tools for geosciences training

(ERASMUS+ Kurs in Englisch, Zielgruppe B.A./B.Sc. ab 4. Semester, Wahlbereich)

Course ID
170139
	Time, Place
	Vorbesprechung:
	    TBA
	Virtual Lectures:
	    TBA
	Summerschool:
	    24.-29.04.2022
		Lecturer
		Jürgens
		Moos
		Redecker

Course type Virtual Seminar, Summerschool	Registration Anmeldung vom 13.-17.12.2021 internetgestützt über GI-Seite ("Aktuelles") *UND* Bewerbung an carsten.juergens@rub.de	Form of Examination Project work

Prerequisites
Adequate English language skills and students' personal motivation are prerequisites for participation in this course. Basic knowledge and skills in geomatics/GIS, cartography/geovisualisation, geography, geography teaching (future geography teachers) The seminar is financially supported within the ERASMUS+ program. Maximum number of participants: 4 students.

Target Group

Wahlpflichtmodul B.Sc. und B.A. ab 4. Semester und M.Sc./Ph.D.

Ziele

The goals of Virtual exchange and summerschool are:

1) to educate participants about ways of transferring contact, technology- and field-based education to digital in the sense of methods and tools for geosciences training; to reinforce the quality of contact-based training in fully digital environments,

2) to equip students with cutting-edge skills and knowledge in the field, which accelerates their readiness and preparedness for the upcoming digital era in Geosciences education, and consequently at the European labour market,

3) to give students a chance to experience digital education at selected hosting institution (from the consortium) by active participation on lectures and practices,

4) to reflect on experiences from virtual exchanges, share them with national participants and start discussions about it to stimulate their creativity,

5) to organise the Summerschool where all participants meet in-person to share their experiences from the previous virtual part (students will work in international teamsat the Summer school) and conduct activities 5), 6) and 7),

6) to establish international teams to work on the selected topic for virtual lecture designs by a mix of their specialisation. These digital lecture designs will be consulted with staff members and reviewed/tested by another team. This will require team-to-staff and team-to-team collaboration and discussions,

7) to introduce (by staff) and practically test (by students) already pre-developed digital lectures designs by staff members. Lecture-testing will engage students in the activity and help them to "tune" their mindsets into a creative atmosphere of their own lecture designs,

8) to transform students experiences, knowledge, skills and ideas about Geosciences digital education into a specific and "tangible" new lecture designs (mutually "playtested"). Creative process of lecture designs is envisioned to be intensive (small "hackaton") to keep students engaged. These new lecture designs will be packed as versatile workbooks (in unified formatting and style).

Goals

From the blended learning perspective - first, there will be virtual exchanges part (at least three "visits" per student) covering abovementioned points 3) and 4). Students will reflect on their experiences within national teams under the supervision of local staff member. Later, at the beginning of the Summerschool, students will collectively share their experiences with all DigiGeo participants. The physical mobility part represents a 5-days course - Summerschool (April 2022). This is a key activity of the project since the students will have a chance to meet in person, share their experiences and skills, establish international teams, absorb new knowledge from staff lectures and workshops, absorb and adopt cutting-edge technological skills and finally develop their own new lecture designs for Geosciences digital education

Selection procedure:

To participate in the course, students must register for the course and submit an individual application during the Geography Department's election week (Dec. 13-17, 2021). Applications will be accepted in the form of a PDF file as of now by email. These should include the following documents:

• Motivation Letter

• curriculum vitae

• Information of studies progress (Transcript of Records, if necessary supplemented by modules whose evaluation is still pending). Application deadline is 17.12.2021 at 23.59. Applications should be sent to:

Prof. Dr. Carsten Jürgens (carsten.juergens@rub.de)

Structure

3x online/virtual exchange, 5-day summer school in Olomouc

The Summerschool schedule will be as follows:

Day 1 – welcoming part - introduction of the Summerschool and collective discussions about the virtual exchanges (half day); lectures&methodological workshops on pedagogy and geoinformation technologies (UTU, UPOL, half day)

Day 2– lectures&methodological workshops on geography, its equipment and visualisation (RUB, TUW, half day); and technology & VR (NTNU, half day)

Day 3 – intensive teamworks/hackaton - lecture designs creation (with staff "drop-ins") & debriefings

Day 4 – intensive teamworks/hackaton - lecture designs creation (half day); mutual testing of lecture designs & reflection (half day)

Day 5 –finalising the lecture design workbooks templates (half day); feedback, open discussion, brainstorming & closure (half day)

Literature
Will be announced in the seminar

Master (Elective Modules, 6 CP)

170096 Microeconomics of Competitiveness: Firms, Clusters and Economic Development

Seminar Mon 2-5 pm First session: 04 April *Kiese, Matthias*
3 SWS Registration: email to lecturer by 31 Mar 2022 (Matthias.kiese(at)rub(dot)de) *Rohde, Simon*

Description:

Synchronous

SoSe 2022: Microeconomics of Competitiveness: Firms, Clusters and Economic Development		
Course ID	**Time, Place**	**Lecturer**
170096	synchron, Mon 14-17 pm	Kiese, Rohde
Course type	**Registration**	**Form of Examination**
Seminar	Anmeldung vom 13.-17.12.2021	Hausarbeit
Prerequisites		
Fluency in English		
Target Group		
Graduate and PhD students across all programmes		
Ziele		
Microeconomics of Competitiveness (MOC) is a graduate course created in a multiyear development effort by Professor Michael E. Porter and the staff and affiliates of the Institute for Strategy and Competitiveness at Harvard Business School. The MOC course explores the determinants of competitiveness and successful economic development viewed from a bottom-up, microeconomic perspective. While sound macroeconomic policies, stable legal and political institutions, and improving social conditions create the potential for competitiveness, wealth is actually created at the microeconomic level. The sophistication and productivity of firms, the vitality of clusters, and the quality of the business environment in which competition takes place, are the ultimate determinants of a nation or region's productivity.		

Contents

The course has been designed not only for students at Harvard but as a platform that can be taught at universities throughout the world. The course platform consists of case studies and other written materials plus an extensive library of video content that can be used in class including lectures by Prof. Porter for all sessions and videotapes of case protagonists including heads of state, senior ministers, governors, and others.

Following Harvard's tradition, the course is based on case studies only. Each session deals with a particular company, region or country case investigating the drivers of competitiveness. As preparation for each session, all students are required to read the respective case of approx. 20 cases. A three-hour session will typically include case discussions in small and large groups, audio-visual inputs featuring Prof Porter and case protagonists, as well as a brief lecture input introducing the key theoretical concept illustrated by the case. As coursework, groups of up to four students prepare a case study analysing the competitiveness of a cluster of their own choice. The best paper will be submitted for a competition with student papers from more than 100 universities world-wide teaching the MOC course.

For further information, see http://www.geographie.ruhr-uni-bochum.de/studium/moc

Structure

- Competitiveness: Overall Framework
- Competing Across Locations & Global Strategies for Multinational Corporations
- The Diamond Model of Competitive Advantage
- Clusters and Cluster Development
- Institutions for Collaboration
- Economic Strategy for Countries at Different Levels of Development, Regions and Cities
- Creating Shared Value (CSV): The Corporate Role in Social and Economic Development
- Team Project Presentations
- The Process of Economic Development
- Putting Porter into Perspective: Criticism and Alternative Perspectives on Competitiveness

Lecture

Porter, M. E., 2008: On Competition. (=The Harvard Business Review Book Series). Boston: The Harvard Business School Publishing.
Porter, M.E.; Kramer, M.R., 2011: Creating Shared Value. In: Harvard Business Review, 89(1), S. 62-77.
Porter, M.E.; Takeuchi, H.; Sakakibara, M., 2000: Can Japan Compete? Basingstoke: Macmillan.

170097 **(BISTUS XI): Urban Biodiversity – The Relevance and Applicability of Functional Traits**
Seminar   Registration: Please contact Luis.Inostroza(at)rub(dot)de stating name, matriculation number, and   *Knapp, Sonja*
study program.
Registration closing March 31, 2022

Description:

Block seminar 27 Jun - 01 Jul 2022, 4 pm - 6:30 pm, IA 1/131

SoSe 2022: (BISTUS XI): Urban Biodiversity – The Relevance and Applicability of Functional Traits		
Course ID	**Time, place**	**Lecturer**
170097	Block seminar 27 Jun – 01 Jul, 4 pm – 6:30 pm, IA 1/131	Dr. Sonja Knapp

Course type	Registration	Form of Examination
Interdisciplinary seminar	Please contact Luis.Inostroza(at)rub(dot)de stating name, matriculation number, and study program. Registration closing **March 31, 2022.** Places will be allocated on a first come, first served basis.	Written (seminar paper)

Prerequisites
Basic biological and ecological knowledge as well as basic knowledge of biodiversity

Target group
Master and PhD students

Goals
Get to know functional aspects of biological diversity
Understand the role of functional traits in ecosystems
Get an overview on how urbanization changes biodiversity through filtering for functional traits
Get inspired about how functional traits can guide choices of plant species for urban settings, as well as design and management of urban green infrastructure

Contents
1) Urban biodiversity –an overview
2) Functional traits and functional diversity –definitions and examples
3) Functional traits and diversity as key to ecosystem functioning and stability
4) Understanding and predicting effects of global change on biodiversity using traits
5) Applying traits in the design of urban green infrastructure

Structure
Preparatory reading
Introductory and deepening lectures
Group work on selected questions
Seminar/ group work presentations
Post-course written seminar paper on selected topic

Literature
Aronson M.F.J., et al. 2016. Hierarchical filters determine community assembly of urban species pools. Ecology, 97(11), 2952–2963. https://doi.org/10.1002/ecy.1535

Lundholm J., Tran S., Gebert L. (2015) Plant Functional Traits Predict Green Roof Ecosystem Services. Environmental Science and Technology 49(4), 2366–2374. https://doi.org/10.1021/es505426z

Williams N.S.G., Hahs A.K., Vesk P.A. (2015) Urbanisation, plant traits and the composition of urban floras. Perspectives in Plant Ecology, Evolution and Systematics 17, 78–86. https://doi.org/10.1016/j.ppees.2014.10.002

170138	**Spationomy 2.0**		
	Seminar	Registration via carsten.juergens(at)rub(dot)de	*Jürgens, Carsten*
	3 SWS		*Moos, Nicolai*
			Redecker,
			Andreas. P.

Description:

6 participants
Block seminar: 02 - 10 Nov 2022 in Olomouc, CZ

for more information see Bachelor Elective Module above

170139	**DigiGeo**		
	Seminar	Registration via carsten.juergens(at)rub(dot)de	*Jürgens, Carsten*
			Moos, Nicolai
			Redecker,
			Andreas.P.

Description:

4 participants
Block seminar: 24 - 29 Apr 2022 in Olomouc, CZ

for more information see Bachelor Elective Module above

170140	**Urban modelling for post-industrial cities – Collaborative UNIC Course**		
	Seminar	Registration online, 13-17 Dec 2021 (via website "Studinews")	*Rienow, Andreas*
	3 SWS		

Description:

Block seminar: 07 - 11 Mar 2022, 9 am to 5 pm, IA 6/171
Synchronous Virtual-Exchange-Modul with University of Zagreb und University of Liège

SoSe 2022: Urban modelling for post-industrial cities – Collaborative UNIC Course (Bochum, Liège, Zagreb, Cork)		
Course ID 170140	**Time, Place**	**Lecturer** Jun. Prof. Dr. Andreas Rienow, Ass. Prof. Dr. Luka Valožić, Prof. Dr. Jacques Teller, Dr. Paul Holloway,
Course type Seminar	**Registration** Anmeldung vom 13.-17.12.2021 internetgestützt über GI-Seite ("Aktuelles") oder anders?	**Form of Examination** Short presentation of a story map
Prerequisites Fundamentals of GIS/remote sensing (on a bachelor level) are expected.		
Target Group All students participating in the module are enrolled as master students.		
Goals Having successfully passed the module, the students • have fundamental knowledge of principles of urban remote sensing and its application • have fundamental knowledge of principles of urban expansion simulation models and their application (drivers, effects and measures); • are familiar with innovative urban projects and complex project set-ups: public-private partnership, innovative institutional structures, sustainable urban planning		

- can estimate the impacts of urban expansion on the coupled human environment system and urban rural interactions, considering issues like mobility, climate change, CO_2 emissions, exposure to floods and other types of hazards;
- are able to extract thematic spatio-temporal information from the analysis of remote sensing, cadastral and crowd sourced data;
- are able to visualize the results of urban expansion models through a combination of static and dynamic supports;
- know the limitations of methodological approaches embedded in current software and theoretical definitions of key concepts underlying urban expansion;
- envision the smart, resilient, green, and equitable city.

Contents
- Introduction to concepts of urban systems, planning, and simulation.
- Overview of data sources (EO, VGI, cadastral and more) and their specific characteristics and application possibilities.
- Complexity of urban systems.
- Urban planning and concepts of sustainable urban areas.
- Application of urban models and geodata for modelling urban-rural dynamics.
- Policy orientations as regards with no net land take, in-fill development, urban containment and densification policies through comparative approaches in Europe.
- Planning and creating individual practical projects.

The course is embedded in the UNIC network. The European University of Post-Industrial Cities (UNIC) consists of eight universities situated in different countries throughout Europe, representing eight different post-industrial cities.

Structure
Theory-based discussions, (hands-on) tutorials, group work, final practical project within an international group

Literature
Behnisch M., Kretschmer O., Meinel G. (Eds.) (2018): Flächeninanspruchnahme in Deutschland. Springer Spektrum, Berlin, Heidelberg. https://doi.org/10.1007/978-3-662-50305-8_3
Hassan, M. and Elhassan, S. (2020): Modelling of Urban Growth and Planning: A Critical Review. Journal of Building Construction and Planning Research, 8, 245-262. doi: 10.4236/jbcpr.2020.84016.

Taubenböck H., Wurm M., Esch T., Dech S. (Eds.) (2015): Globale Urbanisierung. Springer Spektrum, Berlin, Heidelberg. https://doi.org/10.1007/978-3-662-44841-0_9

170141 **Bochum Urban Climate Summer School**
Application via BUCSS website

Seminar   Description: *Bechtel, Benjamin*

5 participants
Block seminar: Aug/Sep 2022

SoSe 2022: Bochum Urban Climate Summer School on Urban Climate Informatics		
Course ID 170141	**Time, Place** Block: Termin vrs. Im August oder September	**Lecturer** Benjamin Bechtel,
Course type Summer School	**Registration** **via BUCSS website (approx. April 22)** climate.ruhr-uni-bochum.de/bucss/	**Form of Examination** Short paper

Prerequisites
basic knowledge about Urban Climatology; advanced computer skills; English language skills.

Target Group
advanced MSc and PhD students

Ziele
In the school, which will be taught by global leading experts from the field, we focus on novel data (e.g. from satellites, IoT, wearables, mobile sensors), big data-driven urban computing and analytics, and advanced data processing techniques. In particular, the focus will be on remote sensing, crowd-sourcing, and modelling. Students will learn state of the art methods with a goal of creating an active pool of young scientists that tackle the major urban sustainability challenges facing future generations.

Goals
Cities nowadays provide facilities and services, business opportunities and cultural attractions of unprecedented complexity, triggering more than a half of the world's population to strive for comfort and safety. The scientific community, local authorities, stakeholders and the public show high and constant interest for monitoring and evaluating the environmental impact of the metropolitan regions, in order to better use the current resources and prepare for future challenges. Cities are vital in the response to climate change and urban population increase. Urban-induced effects and impacts owing to long-lived emissions of greenhouse gases trigger physical and socio-economic consequences that affect the livelihoods of urban dwellers. Such challenges call for enduring scientific advancements, improved training and increased awareness of topical issues.
Since more and more challenges in urban climatology and adaption of urban areas require advanced numerical computing techniques, sophisticated (big) data processing and machine learning, this course focuses on the new field of urban climate informatics (UCI). It is introduced by Ariane Middel (Arizona State University, U.S.) and synthesizes two established domains: Urban Climate (concerned with interactions between a city and the overlying atmosphere), and Climate Informatics (a combination of climate science with approaches from statistics, machine learning, and data mining). UCI seeks to explore and understand complex urban climate systems using novel sensing approaches, big data sources, and artificial intelligence.

Structure
Details will be published on BUCSS website. Check climate.rub.de/bucss/ for updates.

Literature

Oke, T. R., Mills, G., Christen, A., & Voogt, J. A. (2017). Urban Climates. Cambridge: Cambridge University Press. https://doi.org/10.1017/9781139016476

https://www.frontiersin.org/research-topics/13813/urban-climate-informatics