

**The teaching program for the summer semester 2021 is based on digital teaching.
Thus, the dates and time specifications refer to synchronous
or asynchronous events.**

Bachelor (Elective Modules, 6 CP)

170120a **Introduction to programming and applied statistics**
Seminar Registration online, 1-5 Feb 2021 (via website "Studinews") *Sismanidis,
Panagiotis*

Description:

Asynchronous

170120b **Introduction to programming and applied statistics**
Seminar Registration online, 1-5 Feb 2021 (via website "Studinews") *Sismanidis,
Panagiotis*

Description:

Asynchronous

SoSe 2021: Introduction to programming and applied statistics		
Veranstaltungs-Nr. 170120a-b	Zeit, Ort Asynchron, online	Dozent Panagiotis Sismanidis
Lehrveranstaltungsart Seminar	Anmeldung Anmeldung vom 01.-05.02.2021 internetgestützt über GI-Seite ("Aktuelles")	Prüfungsform Final project
Voraussetzungen Basic knowledge in statistics.		
Zielgruppe 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 <ul style="list-style-type: none"> • Basic knowledge about fundamental methods in sciences, in particular, processing of large research datasets. • 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, analyse and write data using Python and Pandas. • Designing clear and effective data visualizations using Python. 		
Inhalte 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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. 		
Aufbau 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 exercises (Studienleistung). To complete this course the students, have to prepare a final project that includes several programming tasks (Prüfungsleistung).		
Literatur <ol style="list-style-type: none"> 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 		

170138 **Spationomy 2.0**
Seminar Registration via carsten.juergens@rub.de
3 SWS

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

Description:

6 participants
Block seminar: 20- 24 Sep 2021

Master (Elective Modules, 6 CP)170096 **Microeconomics of Competitiveness: Firms, Clusters and Economic Development**Seminar Mon 2-5 pm First session: 12 April
3 SWS Registration: email to lecturer by 31 Mar 2021 (Matthias.kiese@rub.de)Kiese, Matthias
Rohde, Simon

SoSe 2021: Microeconomics of Competitiveness: Firms, Clusters and Economic Development		
Veranstaltungs-Nr. 170096	Zeit, Ort Mon 14-17	Dozent*in Kiese, Rohde
Lehrveranstaltungsart Seminar	Anmeldung Anmeldung vom 01.-05.02.2021 internetgestützt über GI-Seite ("Aktuelles")	Prüfungsform group project report
Voraussetzungen fluency in English		
Zielgruppe Master and PhD students across all disciplines		
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.		
Inhalte 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 pages. 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 (cf. http://www.isc.hbs.edu/econ-student_projects.htm).		
Aufbau Course topics include: <ul style="list-style-type: none"> • 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 • Attracting Foreign Direct Investment • 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 Case studies include: <ol style="list-style-type: none"> 1) Building a Cluster: Electronics and Information Technology in Costa Rica 2) Volvo Trucks: Penetrating the U.S. Market 3) The Japanese Facsimile Industry in 1990 4) Estonia: From Transition to EU Membership 5) The California Wine Cluster 6) The Dutch Flower Cluster 7) Remaking Singapore 8) Indonesia: Attracting Foreign Investment 9) New York City: Bloomberg's Strategy for Economic Development 10) European Integration: Meeting the Competitiveness Challenge 11) Intercorp: CSV for Education in Peru 12) Ghana: National Economic Strategy 		
Literatur Porter, M. E., 2008: On Competition. (=The Harvard Business Review Book Series). Boston: The Harvard Business School Publishing. Proprietary case material for each session will available on Moodle.		

170120 **(BISTUS IX): Urban Climate & Environmental Justice**
 Seminar Registration online, 1-5 Feb 2021 (via website "StudineWS") Hamstead, Zoe

Description:

Block seminar: 28 Jun till 02 Jul 2021, from 5:15-7:45 pm (every day)

RUHR-UNIVERSITÄT BOCHUM
 Institute of Geography



Bochum International Seminar on the Transformation of Urban Spaces (BISTUS IX): Urban Climate & Environmental Justice

- Dates: 28 June – 02 July, Time: 17.15 – 19.45 hrs CET
- Platform: Zoom
- Interdisciplinary seminar for **Master and PhD students**, 6 CP
- Registration closing **31 March, 2021**. Places will be allocated on a first come, first serve basis.
- Please contact matthias.kiese@rub.de stating name, matriculation number, and study program.

Contents

- 1) History and evolution of Climate & Environmental Justice (CEJ) movements
- 2) Pluralist understandings of Climate & Environmental Justice
- 3) Urban climate governance practices that engage in dimensions of justice
- 4) Application of CEJ analytic technique and conceptual frameworks to case studies
- 5) Critical Heat Studies and other emerging frameworks for more fully integrating EJ theory & praxis into urban climate governance



Lecturer: Zoé Hamstead, PhD
 Assistant Professor of Environmental Planning & Founding Director, Urban Resilience Lab
 University of Buffalo, NY



170131 **Metabolism. Exploring transformative material processes through the interactions between man and nature**
 Seminar Wed 9 pm till 1 am First session: 14 April Inostroza, Luis
 4 SWS Registration online, 1-5 Feb 2021 (via website "StudineWS")

SoSe 2021: Metabolism. Exploring transformative material processes through the interactions between man and nature		
Veranstaltungs-Nr. 170131	Zeit, Ort Synchron. Wednesday 9-13hrs	Dozent*in Dr. Luis Inostroza
Lehrveranstaltungsart	Anmeldung Anmeldung vom 01.-05.02.2021 internetgestützt über GI-Seite ("Aktuelles")	Prüfungsform Oral examination
Voraussetzungen None		
Zielgruppe BSc/MSc (archaeology, history, sociology, anthropology, geosciences, material sciences, engineering, architecture and economics)		
Ziele This course aims to discuss and analyse the concept of metabolism and its possible applications to understand human-nature interactions and transformative processes in the XXI century in a transdisciplinary context. Transdisciplinary approaches require the integration between social and natural sciences.		
Inhalte Understanding human involvement in transformative material processes is one of the most crucial aspects to face the current substantial global socio-environmental transformations. The word metabolism means transformation, change of matter, thus implying the transfiguration of material elements, producing new entities that are essentially different from their original components. Several disciplines use the metabolism concept sharing a common materialistic ground. Metabolism has been used since the 19th century in a broad range of scientific fields, from biology, medicine and ecology to anthropology, philosophy, economy and political theory. In biology, metabolism was the cornerstone in developing a practical understanding of how individual bodies maintain themselves by feeding on others, ingesting sources from outside. Metabolism constitutes the defining characteristic of all living organisms, thereby allowing their autonomy in a changing environment. In ecology, Metabolism is a powerful concept to understand ecosystems dynamics. Today, metabolism remains an important conceptual ground also for theories about social functioning. In philosophy, metabolism establishes the defining line between the living and not living; in this distinction, to metabolise is to live and is the foundation of the freedom of living organisms. In political economy, Marx uses the concept to define the relationship between man and nature through labour. Metabolism can even express the cultural management of a society's energy needs, such as in the case of pig husbandry. Indeed, Metabolism is a		

powerful concept for a transdisciplinary integration under a common understanding of the profound material and energy transformations performed by humans in their interaction with nature. In a context of contemporary environmental and social crisis, the metabolism concept can provide new transdisciplinary understandings to reset our exhausting relationship with nature and the overcame XX century conceptual apparatus. The metabolism concept is increasingly recognized as a powerful concept for sustainable development.

Aufbau

Course structure

The course will be divided into two parts: (a) a theoretical part, in the form of lectures and (b) a workshop of case studies with the students' participation.

a. Contents of the theoretical part:

The main topics to be covered here will be structured into four parts:

1. The philosophy. Conceptual foundations. The split of humans from Nature. From the Greeks to Hegel. Christianity. The concept of Nature in some other cultures.
2. The history. The operational foundations. Development of normal science. The role of the illustration and the scientific revolutions, from Newton to Marx, Heisenberg and Odum. The metabolism concept within today's normal science. Ecology and materialism.
3. The matter for us. We are what we eat: human-based metabolism. The human metabolic evolution. Metabolic profiles. An omnivorous or a vegan ape?
4. The matter for the planet. Biosphere and resource efficiency. Gaia? The web of life. Limits to growth, planetary metabolism and boundaries. The second law of thermodynamics. Extraterrestrial exploration.

a. Workshop of case studies:

The second part corresponds to a series of case studies developed by the students. The case studies will be assigned during the lectures and will cover the four main topics (a).

Grading

The grade will be based on the case study presentation. The case study will be systematically developed throughout the semester. Students will present their advances and receive lecturers' comments and requests to follow. Specific guidance, as well as reading material, will be provided to case study according to the particular needs and development status. Each case study must accumulate a minimum of 3 presentations throughout the semester to pass. Students with less than 3 presentations will fail. At the end of the semester, only students with more than 3 presentations will have the chance to give the final oral presentation of their case study. The final presentation will last 20 minutes followed by questions. The final seminar's evaluation (mark) will be based on this final presentation.

International Workshop

This lecture is coupled with an international workshop organized in the context of the REFORM project (Leibniz campus). Students will have the chance to join this international metabolism workshop, which will take place 3 times along the semester at RUB (two times online, one time presential). This international workshop will bring to RUB a set of selected international scholars to discuss the metabolism concept under transdisciplinary approaches and feasible conceptual and operational pathways for scientific and disciplinary integration.

Literatur

- Ayres, R.U., Simonis, U.E., 1994. Industrial metabolism: restructuring for sustainable development. United Nations University Press New York.
- Baccini, P., Brunner, P.H., 2012. Metabolism of the Anthroposphere. Analysis, Evaluation, Design, second edi. ed. The MIT Press, Cambridge, MA.
- Childe, V.G., 1951. Man makes himself.
- Foster, J.B., 2000. Marx's Ecology: Materialism and Nature. Monthly Review Press, New York.
- Georgescu-Roegen, N., 1986. The Entropy Law and the Economic Process. Harvard Univ. Press., NY.
- Haberl, H., Fischer-Kowalski, M., Krausmann, F., Winiwarter, V., 2016. Social Ecology. Society-Nature Relations across Time and Space. Springer International Publishing.
- Harari, Y.N., 2014. Sapiens: A Brief History of Humankind. HarperCollins Publishers.
- Hornborg, A., 2001. The Power of the Machine: Global Inequalities of Economy, Technology, and Environment. Altamira Press.
- Moore, J.W., 2015. *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*. Verso Books.
- Prigogine, I., Stenger, I., 1984. Order Out of Chaos. Man's New Dialogue With Nature. Bantam Books, Inc, New York.

170138	Spationomy 2.0	Seminar Registration via carsten.juergens@rub.de 3 SWS	<i>Jürgens, Carsten Moos, Nicolai Redecker, Andreas. P.</i>
		<u>Description:</u> 6 participants Block seminar: 20- 24 Sep 2021	
170141	Bochum Urban Climate Summer School	Seminar Application via BUCSS website 2.5 SWS	<i>Bechtel, Benjamin Demuzere, Matthias</i>
		<u>Description:</u> 5 participants Block seminar: 13-17 Sep 2021	

SoSe 2021: Bochum Urban Climate Summer School on Urban Climate Informatics		
Veranstaltungs-Nr. 170141	Zeit, Ort Block 13.-17.9.21	Dozent*in Benjamin Bechtel, Matthias Demuzere
Lehrveranstaltungsart Summer School	Anmeldung via BUCSS website (approx. April 21) climate.ruhr-uni-bochum.de/bucss/	Prüfungsform Short paper
Voraussetzungen basic knowledge about Urban Climatology, basic programming skills, advanced computer skills. Course will be taught in English.		
Zielgruppe 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.		
Inhalte 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.		
Aufbau Details will be published on BUCSS website. Check climate.rub.de/bucss/ for updates.		
Literatur 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		

170146

Green Infrastructure Planning: Frontiers and Case Studies

Seminar Mon 4-6 pm First session: 12 April
3 SWS Registration online, 1-5 Feb 2021 (via website "Studinews")

Albert, Christian
Wang, Jingxia

SoSe 2021: Green Infrastructure Planning: Frontiers and Case Studies		
Veranstaltungs-Nr. 170146	Zeit, Ort Synchron, Montags, 16:00-17:30	Dozent*in Dr. Jingxia Wang, Prof. Christian Albert
Lehrveranstaltungsart Seminar	Anmeldung Anmeldung vom 01.-05.02.2021 internetgestützt über GI-Seite ("Aktuelles")	Prüfungsform Ausarbeitung (als Gruppenarbeit)
Voraussetzungen Keine		
Zielgruppe Studierende im MSc.		
Teaching objective The teaching objective of familiarize students with advanced understanding of approaches, frontiers and case studies of planning green infrastructure (GI) in metropolitan regions.		
Course content The main focus of this course will be on cases of green infrastructure planning. The course content includes strategies and instruments of green infrastructure planning with a certain focus on insights and practices in Europe and Asia. We will together develop an evaluation framework for assessing existing green infrastructure plans for metropolitan regions, and apply this framework in a set of case studies in Europe and Asia. We will discuss commonalities and differences across cases and draw cross-cutting conclusions. Note: The course is independent from and complementary to the course 'GI in metropolitan regions' which is offered in the winter semester and targeted more on concepts and assessment methods. Participation in the winter course is no prerequisite.		
Structure The seminar will be structured into three consecutive phases <ul style="list-style-type: none"> • Introduction to planning methods • Joint development of an evaluation framework 		

<ul style="list-style-type: none"> • Identification and selection of suitable case studies of green infrastructure planning • Comparative case study analyses and comparisons • Presentations of case study analysis results • Joint development of cross-cutting conclusions
Literatur von Haaren, C., Lovett, A.A., Albert, C. (2019): Landscape planning with Ecosystem Services – Theories and Methods for Application in Europe GreenSurge project website: https://ign.ku.dk/english/green-surge/

170147

Planning transformative change in the urban water sector

Seminar Mon 4-6 pm First session: 12 April
 3 SWS Registration online, 1-5 Feb 2021 (via website "Studinews")

Adem Esmail, Blal

SoSe 2021: Planning transformative change in the urban water sector		
Veranstaltungs-Nr. 170147	Zeit, Ort Mo 16:00-18:00, Zoom	Dozent*in Dr Adem Esmail, Blal
Lehrveranstaltungsart Seminar	Anmeldung Anmeldung vom 01.-05.02.2021 internetgestützt über GI-Seite ("Aktuelles")	Prüfungsform Concise report
Voraussetzungen None		
Zielgruppe MSc students		
Ziele The learning objective of the module is to gain understanding of the multifaceted societal challenges of the urban water sector, hence, to explore planning (and governance) instruments and techniques to foster transformative change towards sustainability in metropolitan regions. The module will use case studies to illustrate the practical application of concepts and instruments.		
Inhalte The module will cover novel approaches to framing urban water challenges as well as planning, and governance instruments to foster transformative change, including <ul style="list-style-type: none"> • Definition of urban water security and socio-ecological-technological systems (SETS) • Transformative change towards sustainability (IPBES and SDGs) • Case studies of water security in metropolitan regions • Environmental Impact Assessment (EIA - German: UVP, UVU, UVS) • Strategic Environmental Assessment (SEA) • Methods of multi-criteria decision analysis for sustainable planning 		
Aufbau Lectures, group discussions, short field trips and oral contributions (presentations as "Studienleistung")		
Literatur Aboelnga, et al. (2019) Urban water security: Definition and assessment framework. Resources 8:1–19. doi Adem Esmail, Geneletti (2020) Ecosystem Services for Urban Water Security. Springer International Publishing, Cham Adem Esmail, Suleiman (2020) Analyzing Evidence of Sustainable Urban Water Management Systems: A Review through the Lenses of Sociotechnical Transitions. Sustainability 12:4481. doi Adem Esmail, Geneletti (2018) Multi-criteria decision analysis for nature conservation: A review of 20 years of applications. Methods Ecol Evol 9:42–53. doi Geneletti D (2013) Ecosystem services in environmental impact assessment and strategic environmental assessment. Environ Impact Assess Rev 40:1–2. doi Mandle, et al. (2016) Entry Points for Considering Ecosystem Services within Infrastructure Planning: How to Integrate Conservation with Development in Order to Aid Them Both. Conserv Lett 9:221–227. doi UN-Water (2013) Water Security & the Global Water Agenda. A UN-Water analytical brief UNEP (2014) Integrating Ecosystem Services in Strategic Environmental Assessment: A guide for practitioners. A report of Proecoserv.		