Economics

wir821 - International Trade, Production and Change

Module label	International Trade, Production and Change
Modulkürzel	wir821
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• kein Abschluss European Studies in Global Perspectives > Society, Economy and Politics • Master Applied Economics and Data Science (Master) > Economics • Master's programme Business Administration: Management and Law (Master) > Kernmodule CHI • Master's Programme Sustainability Economics and Management (Master) > Additional Modules
Zuständige Personen	• Trautwein, Hans-Michael (module responsibility) • Trautwein, Hans-Michael (Prüfungsberechtigt) • Bitzer, Jürgen (Prüfungsberechtigt) • Poppitz, Philipp (Prüfungsberechtigt) • Trautwein, Hans-Michael (Module counselling)
Prerequisites	keine
Skills to be acquired in this module	• Understanding of trade relations, international factor movements and corresponding balance-of-payments mechanisms. • Capability to discuss structural change in global trade and productions in terms of formal models and case studies. • Understanding of the causes and alternative strategies of economic integration in regional blocs. • Understanding of the causes and alternative strategies of economic transformation in emerging markets. • Ability to research data and evaluate the literature on specific aspects of international trade, production and structural change.
Module contents	The lectures and seminar papers address issues in the following subfields: • international trade, • international trade policies and regimes, • geographical economics, • foreign direct investment, • labour migration, • fragmentation of production, • regulations of international trade and factor movements, • development strategies, • regional integration.
Literaturempfehlungen	Brakman, S.; Garretsen, H. & van Marrewijk, C. (2009): The New Introduction to Geographical Economics (2nd ed.). Cambridge: Cambridge University Press. Feenstra, R. (2003): Advanced International Trade: Theory and Evidence. Princeton: University Press. Further references to specific topics and current literature will be given in the events.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Reference text	• Mitarbeit in Vorlesung und Seminar ist Pflicht für den Erwerb eines Leistungsnachweises, der als Referat im Seminar erbracht wird. • Das Seminar wird in der Form eines Blockseminars abgehalten.

- Es gibt eine Vorbesprechung Anfang des Semesters, in der die Themen vergeben werden.

Examination		Prüfungszeiten		Type of examination	
Final exam of module		during term		seminar paper and presentation	
Form of instruction	Comment	SWS		Frequency	Workload of compulsory attendance
Lecture		2			28
Seminar		2			28
Präsenzzeit Modul insgesamt					56 h

wir823 - International Finance and Exchange Rate Economics

Module label	International Finance and Exchange Rate Economics
Modulkürzel	wir823
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• kein Abschluss European Studies in Global Perspectives > Society, Economy and Politics • Master Applied Economics and Data Science (Master) > Economics • Master's programme Business Administration: Management and Law (Master) > Basismodule • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule AFT - VWL
Zuständige Personen	• Trautwein, Hans-Michael (module responsibility) • Trautwein, Hans-Michael (Prüfungsberechtigt) • Trautwein, Hans-Michael (Module counselling)
Prerequisites	
Skills to be acquired in this module	• Understanding of exchange rates as strategic prices in open economies. • Understanding of the interdependence of balance-of-payments constraints and exchange rates. • Capability to discuss different models of exchange rate determination. • Ability to research data and evaluate the literature on specific aspects of financial market globalization and strategies of exchange-rate policy. • Understanding of the history of fixed-exchange-rate systems. • Ability to relate the importance of historical experience in international monetary and financial economics.
Module contents	The lectures address the following issues: • exchange rates and the balance of payments, • open-economy macroeconomics, • exchange rate determination, • international financial markets, • fixed-exchange-rate systems, • currency crises, • optimum currency areas and monetary integration, • choice of exchange rate regime, • financial market regulation. In the seminar students will present papers on general and topical issues (theoretical models, policy strategies, case studies) in the fields of financial market globalization and exchange-rate policy.
Literaturempfehlungen	Selected chapters from: Copeland, L. (2008): Exchange Rates and International Finance (5th ed.). Harlow: Pearson. Eichengreen, B. (2008): Globalizing Capital: A History of the International Monetary System (2nd ed.). Princeton: Princeton University Press. Gandolfo, G. (2016): International Finance and Open-Economy Macroeconomics (2nd ed.). Berlin: Springer. And other specific readings for the seminar papers.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Reference text	• Mitarbeit in Vorlesung und Seminar ist Pflicht für den Erwerb eines Leistungsnachweises. • Das Seminar wird in der Form eines Blockseminars abgehalten. • Es gibt eine Vorbesprechung Anfang des Semesters, in der die Themen vergeben werden.

Examination		Prüfungszeiten	Type of examination	
Final exam of module		Während der Vorlesungszeit	Referat oder mündliche Prüfung	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Seminar		2		28
Präsenzzeit Modul insgesamt				56 h

wir873 - Applied Economics

Module label	Applied Economics
Modulkürzel	wir873
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's Programme Sustainability Economics and Management (Master) > Additional Modules
Zuständige Personen	• Bitzer, Jürgen (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	
Skills to be acquired in this module	The students are able to: - develop an empirical research project, - collect the required data, - carry out an econometric analysis, - interpret, discuss and present the results.
Module contents	The module consists of a lecture and a seminar. In the lecture, the students develop their research project and present their work process. In the bloc seminar, the students present their results and discuss them.
Literaturempfehlungen	
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Reference text	Dieses Modul besteht aus einer Vorlesung und einem Seminar. Beide Veranstaltungen werden in englischer Sprache angeboten. Sollten keine Austauschstudenten teilnehmen, kann auf Wunsch der StudentInnen die Veranstaltung auch in Deutsch abgehalten werden. Die Präsentation von Referaten im Seminar ist in Ausnahmefällen auch in deutscher Sprache möglich.

Examination	Prüfungszeiten	Type of examination
Final exam of module	vary according to type of examination	term paper or seminar paper and presentation or written exam or oral exam or portfolio or project paper

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Seminar		2		28
Präsenzzeit Modul insgesamt				56 h

wir874 - Advanced Microeconomics

Module label	Advanced Microeconomics
Modulkürzel	wir874
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's programme Business Administration: Management and Law (Master) > Basismodule • Master's programme Business Administration: Management and Law (Master) > Kernmodule CHI • Master's programme Social Sciences (Master) > Wahlpflichtmodule anderer Institute und Departments
Zuständige Personen	• Helm, Carsten (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Lehrenden, Die im Modul (Module counselling)
Prerequisites	keine
Skills to be acquired in this module	Students • understand the importance of incentive systems for economic processes and can analyze the effects of incentive systems; • have a firm knowledge in game theory and contract theory, and can address questions in the context of scientific discussion; • are able to apply methods from game theory and contract theory largely independently to the analysis of situations in which agents interact strategically; • are able to design incentive schemes – on their own and in teams – and to acquire knowledge on their own for this purpose and, to present their results, and to defend them in the scientific discourse.
Module contents	The first part of the module covers game theory. Game theory is an important method in economics to analyze strategic interactions of agents, e.g., on markets, in organizations or in bargaining situations. The second part of the module covers contract theory that – according to the Nobel laureate Kenneth Arrow – has been „the most important development in economics in the last forty years“. We work out the fundamentals of screenings, signaling and moral hazard and apply them to different topics, e.g., from labor economics, economic organization and management, law and economics as well as industrial economics. In both parts, there is a tutorial. Here students largely independently apply the acquired knowledge to different situations of strategic interaction in economics and present their results.
Literaturempfehlungen	- Gibbons, R. (1992): A Primer in Game Theory. FT Prentice Hall (main text for 1st part) - Tadelis, St. (2012): Game Theory. An Introduction. ? Princeton Univers. Press. - Watson, J. (2013): Strategy: An Introduction to Game Theory. Norton (main text for 2nd part) - Osborne, M.J. (2003): An Introduction to Game Theory. Oxford University Press. - Salanie, B. (2005): The Economics of Contracts: A Primer. MIT Press.
Links	http://www.fiwi.uni-oldenburg.de/
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period.	exam

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Course or seminar		4	WiSe	56
Exercises			--	0
Präsenzzeit Modul insgesamt				56 h

wir876 - Topics in Economic Research

Module label	Topics in Economic Research
Modulkürzel	wir876
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's Programme Water and Coastal Management (Master) > Socioeconomics
Zuständige Personen	• Bitzer, Jürgen (module responsibility) • Böhringer, Christoph (module responsibility) • Helm, Carsten (module responsibility) • Trautwein, Hans-Michael (module responsibility) • Huse, Cristian (module responsibility) • Gören, Erkan (module responsibility) • Asane-Otoo, Emmanuel (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Lehrenden, Die im Modul (Module counselling)
Prerequisites	
Skills to be acquired in this module	Students have the opportunity to take an economics module of their choice (worth 6 CP) at the master's level. This can also take place at another university or during studies abroad. Students are required to: • independently engage with a topic using scientific methods, • indepedently research and make use of current academic literature, • integrate their topic into an academic discussion.
Module contents	This is dependent upon the module chosen.
Literaturempfehlungen	
Links	
Languages of instruction	
Duration (semesters)	1 Semester
Module frequency	halbjährlich
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	will be announced in the first session	term paper or presentation or written exam or oral exam or portfolio.

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Course or seminar (oder Kolloquium)		4	SoSe	56
Colloquium			SoSe	0
Exercises			SoSe und WiSe	0
Präsenzzeit Modul insgesamt				56 h

wir878 - Public Economics and Market Design

Module label	Public Economics and Market Design
Modulkürzel	wir878
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's programme Social Sciences (Master) > Wahlpflichtmodule anderer Institute und Departments • Master's Programme Sustainability Economics and Management (Master) > Additional Modules • Master's Programme Water and Coastal Management (Master) > Socioeconomics
Zuständige Personen	• Lehrenden, Die im Modul (Module counselling) • Helm, Carsten (Module counselling) • Helm, Carsten (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	none
Skills to be acquired in this module	The students are able • to understand sources of market failures and government failures • understand taxing and spending activities of governments • understand the distinction between normative and positive perspectives in the evaluation of government policy • to apply economic methods to current issues in public economics • present their research result in the form of written papers and oral presentations
Module contents	• The course covers key concepts of public economics, which studies how government taxing and spending activities affect the economy – economic efficiency and the distribution of income and wealth. Lecture: After introducing the theory and methodology of public economics, we discuss a historical and theoretical overview of the public sector. We then focus on departures from efficiency (especially asymmetric information), taxation issues (including tax evasion, fiscal federalism and tax competition among independent jurisdictions), and the intertemporal issue of social security (especially pension system). Seminar: covers current issues in public economics, e.g. reform of health care or pension system.
Literaturempfehlungen	• Hindriks, J. and G. D. Myles (2013): Intermediate Public Economics, MIT Press, Cambridge. • Rosen, H.S. and T. Gayer (2010): Public Finance, Mcgraw-Hill Higher Education. • Blankart, C. B. (2011): Öffentliche Finanzen in der Demokratie, Vahlen, München. • Corneo, G. (2009): Öffentliche Finanzen: Ausgabenpolitik, Mohr Siebeck, Tübingen.
Links	http://www.fiwi.uni-oldenburg.de/
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	30
Reference text	The seminar will be conducted as a block seminar

Examination	Prüfungszeiten	Type of examination
Final exam of module	end of semester	seminar paper end presentation

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Vorlesung und Seminar		2	SoSe	28
Seminar		2		28
Präsenzzeit Modul insgesamt				56 h

wir901 - Environmental Economics

Module label	Environmental Economics
Modulkürzel	wir901
Credit points	6.0 KP
Workload	180 h (Lecture: 3 SWS (42h) Exercise: 1 SWS (14h))
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM-VWL • Master's Programme Computing Science (Master) > Module aus anderen Studiengängen • Master's Programme Environmental Modelling (Master) > Mastermodule • Master's Programme Sustainability Economics and Management (Master) > Basic and Accentuation Modules
Zuständige Personen	• Helm, Carsten (Module counselling) • Lehrenden, Die im Modul (Module counselling) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Helm, Carsten (module responsibility)
Prerequisites	Keine
Skills to be acquired in this module	Know and be able to apply fundamental concepts and figures of thought in environmental economics; be able to analyse and evaluate environmental problems and solution approaches; practice scientific methods and the ability to discuss; be able to classify environmental economics in the context of interdisciplinary sustainability research.
Module contents	Economic analysis of environmental impacts (property rights, external effects, market failure); ethical aspects of environmental economics, instruments of environmental policy (tradable permits, taxes, subsidies, liability law); innovation and adaptation of new technologies; international environmental problems.
Literaturempfehlungen	Daniel J. Phaneuf and Till Requate. *A Course in Environmental Economics: Theory, Policy, and Practice*. Cambridge University Press, 2016. Roger Perman, Yue Ma, Michael Common, David Maddison and James McGilvray. *Natural Resource and Environmental Economics*. Addison Wesley. 2011 (4th edition).
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	Annually
Module capacity	unlimited
Type of module	Pflicht o. Wahlpflicht / compulsory or optional
Teaching/Learning method	Lecture and exercise

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Written exam; bonus through solution of exercises

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Exercises		2		28
Präsenzzeit Modul insgesamt				56 h

wir889 - Applied Environmental Economics

Module label	Applied Environmental Economics
Modulkürzel	wir889
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM-VWL • Master's Programme Environmental Modelling (Master) > Mastermodule • Master's Programme Sustainability Economics and Management (Master) > Akzentmodule
Zuständige Personen	• Lehrenden, Die im Modul (Prüfungsberechtigt) • Huse, Cristian (module responsibility) • Huse, Cristian (Module counselling)
Prerequisites	
Skills to be acquired in this module	Be able to conceptually understand and apply key empirical tools used by any economist (and other professionals) in Environmental, Energy, and Transport Economics. Be able to perform and critically evaluate an empirical analysis.
Module contents	Econometric methods (discrete choice); Welfare analysis; Valuation; Types of data; Cost-benefit analysis.
Literaturempfehlungen	Phaneuf, D.J., and T. Requate. *A Course in Environmental Economics: Theory, Policy, and Practice*. Cambridge University Press, 2016. Cameron, A. C., and P. Trivedi (2005). *Microeconometrics: Methods and Applications*. Cambridge: Cambridge University Press.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	
Module capacity	60

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Portfolio

Form of instruction	Lecture
SWS	4
Frequency	SoSe oder WiSe

wir890 - Climate Economics

Module label	Climate Economics
Modulkürzel	wir890
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's Programme Environmental Modelling (Master) > Mastermodule • Master's Programme Sustainability Economics and Management (Master) > Additional Modules
Zuständige Personen	• Böhringer, Christoph (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Riesenbeck, Lukas (Module counselling)
Prerequisites	
Skills to be acquired in this module	This course aims at giving students an understanding of reasons, objectives and economic instruments for climate policy. Students first get acquainted with the natural science of the climate where anthropogenic greenhouse gas emissions constitute the source of man-made climate change. The latter is then explained from an economic perspective as a global environmental externality calling for environmental regulation to avoid substantial market failures. Game theoretic analysis of international negotiations and agreements provides key insights about the fundamental problems of free-riding and efficient climate policy design. Beyond theoretical propositions, 15 the lecture will critically discuss past and contemporary climate policies such as the Kyoto Protocol, the Paris Agreement, or the EU Emissions Trading System
Module contents	atural science of climate change; environmental externalities and market failures; environmental regulation (emission taxes, standards, tradable permits, etc.); international environmental agreements; critical appraisal of climate policy implementation.
Literaturempfehlungen	Roger Perman, Yue Ma, Michael Common, David Maddison and James McGilvray. Natural Resource and Environmental Economics. Addison Wesley. 2011 (4th edition). Daniel J. Phaneuf and Till Requate. A Course in Environmental Economics: Theory, Policy, and Practice. Cambridge University Press, 2016.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	Annual
Module capacity	30
Previous knowledge	Microeconomics

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Written exam (max. 120min)

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir893 - Development Economics

Module label	Development Economics
Modulkürzel	wir893
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's Programme Sustainability Economics and Management (Master) > Additional Modules
Zuständige Personen	• Bitzer, Jürgen (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Bitzer, Jürgen (Module counselling)
Prerequisites	
Skills to be acquired in this module	The students are able: • to identify an discuss empirical challenges in research on developing countries • to understand, summarize, and discuss recent research studies in development economics • evaluate strategies to reach sustainable economic development discussed in the public and politics • participate in a discussion on the topic, developing a well-grounded position and problem solving strategy • to present current research to and discuss it verbally and in written form • to identify gaps in the literature on developing countries
Module contents	The module introduces the students to the current challenges of developing countries and the strategies to overcome them. The module will focus on the empirical research on developing countries, addressing the reasons for the sluggish development as well as the applied approaches to foster economic development. In the lecture the empirical methods used in development economics will be discussed. In the seminar current research papers on topics like poverty, conflicts, foreign aid, health, human capital and institutions in developing countries will be discussed.
Literaturempfehlungen	Michael P. Todaro and Stephen C. Smith (2014): Economic Development, 12th Edition, Pearson: New York. Söderbom, Måns , Francis Teal, Markus Eberhardt, Simon Quinn and Andrew Zeitlin (2015): Empirical Development Economics, Routledge: New York.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	Yearly
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Formal presentation with written elaboration and discussion

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir895 - Industrial Organization

Module label	Industrial Organization	
Modulkürzel	wir895	
Credit points	6.0 KP	
Workload	180 h	
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's programme Business Administration: Management and Law (Master) > Basismodule • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - VWL • Master's Programme Sustainability Economics and Management (Master) > Akzentmodule	
Zuständige Personen	• Huse, Cristian (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Huse, Cristian (Module counselling)	
Prerequisites		
Skills to be acquired in this module	Be able to conceptually understand, critically evaluate, and apply methods used economists to study the behaviour of firms, consumers, and their interaction.	
Module contents	Econometric methods; models of firm behaviour; models of consumer behaviour; regulation; applications.	
Literaturempfehlungen	Belleflamme, P., & Peitz, M. (2015). Industrial Organization: Markets and Strategies. Cambridge University Press. 2nd edition. Addition references to be announced at the start of each term.	
Links		
Language of instruction	English	
Duration (semesters)	1 Semester	
Module frequency		
Module capacity	30	
Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Portfolio
Form of instruction	Vorlesung und Übung	
SWS	4	
Frequency	SoSe oder WiSe	

wir922 - Topics in Industrial Organization

Module label	Topics in Industrial Organization
Modulkürzel	wir922
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics
Zuständige Personen	• Asane-Otoo, Emmanuel (module responsibility) • Bitzer, Jürgen (module responsibility) • Böhringer, Christoph (module responsibility) • Gören, Erkan (module responsibility) • Helm, Carsten (module responsibility) • Huse, Cristian (module responsibility) • Trautwein, Hans-Michael (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	
Skills to be acquired in this module	Students have the opportunity to take an economics module of their choice (worth 6 CP) at the master's level. This can also take place at another university or during studies abroad. Students are required to: - independently engage with a topic using scientific methods - indepedently research and make use of current academic literature - integrate their topic into an academic discussion
Module contents	This is dependent upon the module chosen.
Literaturempfehlungen	
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	bi-annualy
Module capacity	unlimited
Type of module	Wahlpflicht / Elective

Examination	Prüfungszeiten	Type of examination
Final exam of module		1 seminar paper or 1 formal presentation or 1 written examination or 1 oral examination or 1 portfolio or 1 project report

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir751 - Study Abroad I

Module label	Study Abroad I
Modulkürzel	wir751
Credit points	6.0 KP
Workload	180 h (According to the specification of the foreign university)
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's programme Business Administration: Management and Law (Master) > Ergänzungsmodule - Auslandsstudium
Zuständige Personen	• Lehrenden, Die im Modul (Prüfungsberechtigt) • Bitzer, Jürgen (module responsibility) • Bitzer, Jürgen (Module counselling)
Prerequisites	According to the specification of the foreign university
Skills to be acquired in this module	According to the specification of the foreign university
Module contents	According to the specification of the foreign university
Literaturempfehlungen	According to the specification of the foreign university
Links	According to the specification of the foreign university
Languages of instruction	
Duration (semesters)	1 Semester
Module frequency	
Module capacity	unlimited (According to the specification of the foreign university)

Examination	Prüfungszeiten	Type of examination
Final exam of module	According to the specification of the foreign university	According to the specification of the foreign university

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture			--	0
Exercises			--	0
Practical training			--	0
Study trip			--	0
Tutorial			--	0
Präsenzzeit Modul insgesamt				0 h

wir752 - Study Abroad II

Module label	Study Abroad II
Modulkürzel	wir752
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's programme Business Administration: Management and Law (Master) > Ergänzungsmodule - Auslandsstudium
Zuständige Personen	• Bitzer, Jürgen (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Bitzer, Jürgen (Module counselling)
Prerequisites	According to the specification of the foreign university
Skills to be acquired in this module	According to the specification of the foreign university
Module contents	According to the specification of the foreign university
Literaturempfehlungen	
Links	According to the specification of the foreign university
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	According to the specification of the foreign university	According to the specification of the foreign university

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture			--	0
Exercises			--	0
Practical training			--	0
Seminar			--	0
Study trip			--	0
Tutorial			--	0
Präsenzzeit Modul insgesamt				0 h

wir753 - Study Abroad III

Module label	Study Abroad III
Modulkürzel	wir753
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics
Zuständige Personen	• Bitzer, Jürgen (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Bitzer, Jürgen (Module counselling)
Prerequisites	According to the specification of the foreign university
Skills to be acquired in this module	According to the specification of the foreign university
Module contents	According to the specification of the foreign university
Literaturempfehlungen	According to the specification of the foreign university
Links	According to the specification of the foreign university
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	According to the specification of the foreign university	According to the specification of the foreign university

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture			--	0
Exercises			--	0
Practical training			--	0
Seminar			--	0
Study trip			--	0
Tutorial			--	0
Präsenzzeit Modul insgesamt				0 h

wir760 - Computable General Equlibrium Analysis

Module label	Computable General Equlibrium Analysis
Modulkürzel	wir760
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Economics • Master's Programme Sustainability Economics and Management (Master) > Additional Modules
Zuständige Personen	• Böhringer, Christoph (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Böhringer, Christoph (Module counselling)
Prerequisites	None
Skills to be acquired in this module	During the course work students will learn how to set up computable general equilibrium (CGE) models step-by-step using the GAMS software (General Algebraic Modeling System) and apply them to actual policy issues of broader interest.
Module contents	This course provides a practical guideline to CGE modeling. We start with the formulation of a simple stylized CGE model for open economies and lay out how such a model can be matched (calibrated) to empirical data. We will then discuss several refinements of our prototype model to investigate contemporary policy issues such as environmental tax reforms or trade restrictions (e.g. the implementation of import tariffs and quotas). The single country model will be subsequently extended towards a multi-region model framework which accommodates to investigate in appropriate detail the economic impacts of multilateral policy initiatives such as trade policy reforms or international climate agreements.
Literaturempfehlungen	
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	jährlich/annual
Module capacity	14

Examination	Prüfungszeiten	Type of examination
Final exam of module	end of semester	aus der Prüfungsordnung zu entnehmen - to be taken from the examination regulations

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Seminar		2	WiSe	28
Präsenzzeit Modul insgesamt				56 h

Empirical Methods

wir875 - Forecasting Methods

Module label	Forecasting Methods
Modulkürzel	wir875
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Empirical Methods • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - VWL • Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master) • Master's Programme Computing Science (Master) > Module aus anderen Studiengängen
Zuständige Personen	• Stecking, Ralf Werner (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	
Skills to be acquired in this module	With successful completion of the course, students shall: • be aware of and be able to evaluate quantitative forecasting methods. • be able to select adequate methods in relevant fields of application, like time series and classification analysis. • be able to run computer-aided analyses and to interpret the results properly.
Module contents	Various aspects of quantitative forecasting methods such as: • Time series components, • Trend and seasonal methods, • Stationarity, • Multivariate forecasting methods, • Autoregressive and moving average processes, • Box-Jenkins method.
Literaturempfehlungen	Abraham, B. und Ledolter, J. (2005): Statistical Methods for Forecasting, New York Hamilton, J.D. (1994): Time series analysis, Princeton NJ Kohler, U. und Kreuter, F. (2008): Datenanalyse mit Stata : allgemeine Konzepte der Datenanalyse und ihre praktische Anwendung, 3. Aufl., München Kreiß, J.-P. und Neuhaus, G. (2006): Einführung in die Zeitreihenanalyse, Berlin Makridakis, S., Wheelwright, S.C., MacGee, V.E. (1983): Forecasting : methods and applications, New York Neusser, K. (2011): Zeitreihenanalyse in den Wirtschaftswissenschaften, 3. Aufl., Wiesbaden Schira, J. (2016): Statistische Methoden der VWL und BWL, 5. Aufl., München Schlittgen, R. und Streitberg, B.H.J. (2001): Zeitreihenanalyse, München Schlittgen, R. (2001): Angewandte Zeitreihenanalyse, München Thome, H. (2005): Zeitreihenanalyse, München
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	halbjährlich

Module capacity		unlimited		
Examination	Prüfungszeiten		Type of examination	
Final exam of module	end of semester		written exam or oral exam or term paper or seminar paper and presentation	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Exercises		2		28
Präsenzzeit Modul insgesamt				56 h

wir887 - Advanced Econometrics

Module label	Advanced Econometrics
Modulkürzel	wir887
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Empirical Methods
Zuständige Personen	• Huse, Cristian (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Huse, Cristian (Module counselling)
Prerequisites	
Skills to be acquired in this module	Be able to conceptually understand, critically evaluate, and apply methods used in the statistical analysis of data.
Module contents	Introduction to statistical software; Econometrics review; Econometrics and statistical learning methods (Classification, Resampling, Model selection and regularization, Nonlinear models, Tree-based methods, Unsupervised learning); Applications to Economics.
Literaturempfehlungen	James, Witten, Hastie, and Tibshirani (2013). An Introduction to Statistical Learning. Springer Series in Statistics. Grolemund and Wickham (2017). R for Data Science. O'Reilly Media, 1st edition. Papers to be assigned in due course
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	
Module capacity	30

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Portfolio

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir888 - Applied Econometrics Using GIS Techniques

Module label	Applied Econometrics Using GIS Techniques
Modulkürzel	wir888
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Empirical Methods
Zuständige Personen	• Gören, Erkan (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	None
Skills to be acquired in this module	This course provides an introduction to some fundamental geo-processing operations using ArcGIS that are most relevant for economics research. The broad term GIS encompasses a set of tools (both software and hardware) to collect, store, visualize and analyze spatial data from the real world. GIS techniques allow economists to use data on geography and weather as sources of exogenous variation for estimating the causal impact of a wide range of treatments (e.g., infrastructure, mass media, slave trade, land suitability for agriculture, and terrain ruggedness). Satellite images from the earth's surface, which can be analyzed with geo-processing tools in GIS, allow economists to construct geo-spatial indicators (e.g., temporal changes in the intensity of night-time light and patterns of deforestation) that more closely reflect the local actors and underlying mechanisms of interest.
Module contents	• Gain practical experience with the implementation of geo-processing tools using ArcGIS. • Application of GIS programming tools that are most relevant for economics research through replication of various pieces of empirical economics research papers. • A non-exhaustive list of geo-processing tools using ArcGIS includes performing mathematical functions on spatial data, the calculation of geographic distances between various forms of spatial units, aggregating geospatial data within polygons, and drawing maps. • Introduction to map projection and geographic coordinate systems. • Introduction to programming in Python for the purpose of automation and replication of geo-processed spatial datasets. • Acquire the necessary data management skills to export spatial data in a suitable file format that can be directly imported into standard econometric software packages such as Stata.
Literaturempfehlungen	• Harder, Christian, and Brown, Clint (2016). The ArcGIS Imagery Book: New View. New Vision. First Edition, Esri Press, 380 New York Street, Redlands, California, United States of America. • Harder, Christian, and Brown, Clint (2017). The ArcGIS Book: 10 Big Ideas about Applying The Science of Where. Second Edition, Esri Press, 380 New York Street, Redlands, California, United States of America. • Heywood, Ian, Cornelius, Sarah, and Carver, Steve (2011). An Introduction to Geographical Information Systems. Fourth Edition, Pearson Education Limited, Harlow, England. • Keranan, Kathryn, and Malone, Lyn (2017). Instructional Guide for The ArcGIS Imagery Book. First Edition, Esri Press, 380 New York Street, Redlands, California, United States of America. • Keranan, Kathryn, and Malone, Lyn (2018). Instructional Guide for The ArcGIS Book. Second Edition, Esri Press, 380 New York Street, Redlands, California, United States of America. • Law, Michael, and Collins, Amy (2018). Getting to Know ArcGIS Desktop. Fifth Edition, Esri Press, 380 New York Street, Redlands, California, United States of America. • Zandbergen, Paul A. (2013). Python Scripting for ArcGIS. First Edition, Esri Press, 380 New York Street, Redlands, California, United States of America.
Links	
Languages of instruction	German, English

Duration (semesters)		1 Semester		
Module frequency				
Module capacity		unlimited		
Examination	Prüfungszeiten		Type of examination	
Final exam of module	Am Ende der Vorlesungszeit		Mündliche Prüfung oder Klausur oder Referat oder Projektbericht	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir891 - Complex Data Analysis

Module label	Complex Data Analysis
Modulkürzel	wir891
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Empirical Methods • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule AFT - Methoden • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM - Methoden • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - Methoden • Master's Programme Sustainability Economics and Management (Master) > Additional Modules
Zuständige Personen	• Stecking, Ralf Werner (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	
Skills to be acquired in this module	With successful completion of the course, students shall be able to analyze complex empirical data sets, like aggregated data, privacy constrained data, distance information, distributions, tables, symbolic or granular data. Students will also learn to handle issues of big data challenges: large number of cases or variables, unknown dependencies, redundancy, missing values, small or no variance. In this course students will learn theoretical aspects of complex data analysis, as well as practical applications for real data sets with statistical software packages.
Module contents	Principal Component Analysis, Correspondence Analysis, Cluster Analysis, Linear Discriminant Analysis, Multidimensional Scaling, CART, Symbolic Data Analysis
Literaturempfehlungen	Billard, L. and Diday, E. (2006): Symbolic Data Analysis, West Sussex Hastie, T., Tibshirani, R. and Friedman, J. (2001): The Elements of Statistical Learning, New York Pedrycz, W. (2017): Granular Computing, Boca Raton Tuffery, S. (2011): Data Mining and Statistics for Decision Making, West Sussex
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	Am Ende der Vorlesungszeit	Klausur oder Mündliche Prüfung oder Hausarbeit oder Referat

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir892 - Computational Economics

Module label	Computational Economics
Modulkürzel	wir892
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Empirical Methods • Master's programme Social Sciences (Master) > Wahlpflichtmodule anderer Institute und Departments • Master's Programme Sustainability Economics and Management (Master) > Additional Modules
Zuständige Personen	• Böhringer, Christoph (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Riesenbeck, Lukas (Module counselling) • Schürer, Laura (Module counselling)
Prerequisites	None
Skills to be acquired in this module	Computer-based simulations play a key role for quantifying the economic impacts of policy reforms. Among numerical simulation methods, computable partial equilibrium (CPE) models are widely used in applied economic analysis. These models build on microeconomic theory for describing supply and demand behavior of economic agents on markets. Students will learn how to program such models and apply them to the impact assessment of trade, fiscal, or environmental policies.
Module contents	In the course, we start from basic microeconomic theory to describe the supply-side and demand-side responses on economic markets triggered by regulatory policy measures such as taxes or subsidies. We then translate simple theoretical models into computable partical equilibrium (CPE) models and use empirical data for model parametrization. Subsequently, the CPE models are used to quantify the economic efficiency impacts and the economic incidence of policy instruments such as taxes, subsidies, standards or quotas. For the implementation of the simulatoin models on the students' PC we will learn a powerful state-of-the-art modeling language called GAMS (Generic Algebraic Modeling System) which initially had been developed for World Bank economists. The fundamental strength of GAMS lies in the ease with which algebraic models in economics and management (or other sciences) can be formulated and solved. Students enrolled to the course will receive a free GAMS license. For the examination, the students will be requested to adapt a basic market model towards a policy issue of their choice and provide a small written essay (max. 10 pages) on their applied analysis. For this, the students can team up in groups with 2 people and hand in their essay until the end of the summer semester.
Literaturempfehlungen	Tba
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	Annual
Module capacity	14

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Portfolio

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir894 - Econometrics of Policy Evaluation

Module label	Econometrics of Policy Evaluation	
Modulkürzel	wir894	
Credit points	6.0 KP	
Workload	180 h	
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Empirical Methods • Master's programme Business Administration: Management and Law (Master) > Basismodule • Master's Programme Sustainability Economics and Management (Master) > Basic and Accentuation Modules	
Zuständige Personen	• Huse, Cristian (module responsibility) • Huse, Cristian (Module counselling)	
Prerequisites		
Skills to be acquired in this module	Be able to conceptually understand and apply key empirical methods used by any economist (and other professionals) in the evaluation of policies. Be able to perform and critically evaluate an empirical analysis.	
Module contents	Econometric methods (Causality, Randomization, Regression discontinuity, Difference-in-differences, topics in Microeconometrics); applications.	
Literaturempfehlungen	Gertler, P. et al (2016). *Impact Evaluation in Practice*, 2nd. Edition. Washington, DC: Inter-American Development Bank and World Bank. Cameron, A. C., and P. Trivedi (2005). *Microeconometrics: Methods and Applications*. Cambridge: Cambridge University Press.	
Links		
Language of instruction	English	
Duration (semesters)	1 Semester	
Module frequency		
Module capacity	60	
Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Portfolio
Form of instruction	Lecture	
SWS	4	
Frequency	SoSe oder WiSe	

wir897 - Spatial Econometrics

Module label	Spatial Econometrics
Modulkürzel	wir897
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Empirical Methods
Zuständige Personen	• Gören, Erkan (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	None
Skills to be acquired in this module	This course provides an introduction to spatial econometrics modelling that are particularly appropriate to analyse real-world phenomenons of spatial dependence among geographically proximate units. With successful completion of the course, students shall be able to identify spatial diffusion processes across various empirical settings and to have a thorough understanding in the application, estimation, and interpretation of the relevant spatial regression models.
Module contents	• The formal expression of spatial dependence. • Modelling, estimation, and interpretation of spatial econometric models for cross-sectional, panel, and dynamic spatial panel data. • Gain practical experience with the implementation of spatial econometric models using appropriate econometrics software packages.
Literaturempfehlungen	• Anselin, Luc (1988). Spatial Econometrics: Methods and Models. Kluwer Academic Publishers, Dordrecht, Boston, London. • Darmofal, David (2015). Spatial Analysis for the Social Sciences. Cambridge University Press, New York, USA. • Elhorst, J. Paul (2014). Spatial Econometrics: From Cross-Sectional Data to Spatial Panels. Springer, Heidelberg, New York, Dordrecht, London. • LeSage, James, and Pace, R. Kelley (2009). Introduction to Spatial Econometrics. CRC Press, Taylor & Francis Group, Boca Raton, London, New York.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	Am Ende der Vorlesungszeit	Mündliche Prüfung oder Klausur oder Referat oder Projektbericht

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

Data Science

inf501 - Environmental Information Systems

Module label	Environmental Information Systems
Modulkürzel	inf501
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Data Science • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik • Master's Programme Computing Science (Master) > Angewandte Informatik • Master's Programme Environmental Modelling (Master) > Mastermodule • Master's Programme Sustainability Economics and Management (Master) > Additional Modules
Zuständige Personen	• Vogel-Sonnenschein, Ute (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	
Skills to be acquired in this module	The module gives an overview of the phases and important aspects of the environmental information processing. **Professional competence** The students: - apply basic processing algorithms to classify and process data - compare, evaluate and design data structures to store spatial data efficiently - apply basic functions of a geo-information system - describe, evaluate and apply basic processes of data mining - describe, evaluate and apply basic geostatistics processes - evaluate and apply multicriteria decision making processes **Methodological competence** The students: - use geoinformation systems for environmental appplication - use data mining tools for data analysis **Social competence** The students: - solve tasks in teams of 2-3 students - present and discuss their solutions in class **Self-competence** The students: - reflect their own behaviour with regard to the methods of environmental informatics
Module contents	Content of the Module: Environmental information systems make information about the general environmental state available for public management and public facilities, enterprises or interested citizens. The collection, storage and evaluation of this information is interesting for computer science. Within the scope of the lecture we will examine the processing of environmental information step-by-step, this means: - problems of data acquisition and data processing, - data structures and database concepts for an efficient access to (usually) spatial data, - introduction of data analysis (in particular from geostatistics and data mining), - introduction of multicriteria decision processes, as well as - the supply of data supported by meta data. The module "Umweltinformationssysteme" is accompanied by the module "Modellbildung in Simulation ökologischer Systeme". The subjects of "Modellbildung in Simulation ökologischer Systeme" represent the dynamic aspects of environmental systems (mainly of ecological systems). Nevertheless, the modules can be taken independently from each other.
Literaturempfehlungen	Oliver Günther, Environmental Information Systems, Springer-Verlag, Berlin, 1998
Links	
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich im Sommersemester
Module capacity	unlimited
Reference text	Dieses Modul wird im Sommersemester 2023 letztmalig angeboten.
Type of module	je nach Studiengang Pflicht oder Wahlpflicht

Examination	Prüfungszeiten	Type of examination
Final exam of module	after the end of the lecture period - retake before the upcomming lecture perdiod	Practical exercises and oral examination or portfolio

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		3	SoSe	42
Exercises		1	SoSe	14

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Präsenzzeit Modul insgesamt				56 h

inf535 - Computational Intelligence I

Module label	Computational Intelligence I
Modulkürzel	inf535
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Data Science • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik • Master's Programme Computing Science (Master) > Angewandte Informatik • Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction • Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction • Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering • Master's Programme Environmental Modelling (Master) > Mastermodule
Zuständige Personen	• Kramer, Oliver (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	Basics of statistics
Skills to be acquired in this module	After successful completion of the course, students should have acquired the ability to master the presented methods in theory and practice. The students should be able to recognize and model corresponding optimization and data analysis problems themselves and to apply the methods unerringly. **Professional competence** The students: • recognise optimisation problems • implement simple algorithms of heuristic optimisation • critically discuss solutions and selection of methods • deepen previous knowledge of analysis and linear algebra **Methodological competence** The students: • deepen programming skills • apply modelling skills • learn about the relation between problem class and method selection **Social competence** The students: • cooperatively implement content introduced in lecture • evaluate own solutions and compare them with those of their peers **Self-competence** The students: • evaluate own skills with reference to peers • realize personal limitations • adapt own problem solving approaches with reference to required method competences
Module contents	Computational Intelligence comprises intelligent and adaptive methods for optimisation and learning. The module "Computational Intelligence I" concentrates on methods for evolutionary optimisation and heuristic approaches. The exercises introduce and deepen practical aspects of the implementation and algorithmic design, also taking into account application aspects. **Overview of Content:** • foundations of optimisation • genetic algorithms and evolution strategies • parameter control and self-adaptation • runtime analysis • swarm algorithms • constrained optimisation • multi-objective optimisation

- meta-modeling

Literaturempfehlungen
• EIBEN, A. E.; SMITH, J. E.: Introduction to Evolutionary Computing. Springer, 2003. • KENNEDY, J.; EBERHART, R.C.; YUHUI, S.: Swarm Intelligence. Morgan Kaufmann, 2001. • KRAMER, O.: Computational Intelligence. Springer, 2009. • RUTKOWSKI, L.: Computational Intelligence • Methods and Techniques. Springer, 2008. • ROJAS, R.: Theorie der neuronalen Netze: Eine systematische Einführung. Springer, 1993.

Links	
Languages of instruction	English , German
Duration (semesters)	1 Semester
Module frequency	annual
Module capacity	unlimited
Teaching/Learning method	1VL + 1Ü
Previous knowledge	- Basics of statistics

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Written or oral exam

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Exercises		2	WiSe	28
Präsenzzeit Modul insgesamt				56 h

inf536 - Computational Intelligence II

Module label	Computational Intelligence II
Modulkürzel	inf536
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Data Science • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik • Master's Programme Computing Science (Master) > Angewandte Informatik • Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction • Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction • Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering • Master's Programme Environmental Modelling (Master) > Mastermodule
Zuständige Personen	• Kramer, Oliver (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	useful previous knowledge: Linear Algebra, Stochastics
Skills to be acquired in this module	In the lecture "Convolutional Neural Networks" you will learn the basics of Convolutional Neural Networks, from methodological understanding to implementation. **Professional competence** The Students: • will learn Deep Learning expertise, which are essential qualifications as AI experts and Data Scientists. **Methodological competence** The Students: • learn the methods mentioned as well as the implementation in Python, NymPy and Keras. **Social competence** The Students: • are encouraged to discuss the taught content in groups and work together to implement the programming tasks in the exercises **Self-competence** The Students: • are guided to conduct independent research on advanced methods as the teaching field changes dynamically
Module contents	Students learn the basics of machine learning and in particular the topics of dense layers, cross-entropy, backpropagation, SGD, momentum, Adam, batch normalization, regularization, convolution, pooling, ResNet, DenseNet, and convolutional SOMs
Literaturempfehlungen	• Deep Learning by Aaron C. Courville, Ian Goodfellow und Yoshua Bengio
Links	

Language of instruction		English		
Duration (semesters)		1 Semester		
Module frequency		every summer term		
Module capacity		unlimited		
Teaching/Learning method		1VL + 1Ü		
Previous knowledge		useful previous knowledge: Linear Algebra, Stochastics		
Examination		Prüfungszeiten	Type of examination	
Final exam of module		lecture-free period at the end of the semester	written exam, e-exam	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe	28
Exercises		2	SoSe	28
Präsenzzeit Modul insgesamt				56 h

inf604 - Business Intelligence I

Module label	Business Intelligence I
Modulkürzel	inf604
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Data Science • Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Akzentsetzungsbereich • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik • Master's Programme Computing Science (Master) > Angewandte Informatik • Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction • Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction • Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering
Zuständige Personen	• Marx Gómez, Jorge (Prüfungsberechtigt) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	No participant requirement
Skills to be acquired in this module	**Objective of the module/skills:** Current module provides basics of business intelligence with focus on enterprises and strong emphasis on data warehousing technologies. Students of the course are provided with knowledge, which reflects current research and development in a data analytic domain. **Professional competence** The students: • name and recognize the role of business intelligence as past of daily business process • being able to analyse advantages and disadvantages of different approaches and methods of the data analytics and being able to apply them in simple case studies • obtain theoretical knowledge about data collection and modelling processes, including most applicable approaches and best practices **Methodological competence** The students: • being able to execute typical tasks of business intelligence, and also being able to deepen knowledge on different approaches and methods • gain a hans on experience and being able to understand advantages and disadvantages of different methods and being able to use obtained knowledge in most efficient ways **Social competence** The students: • build solutions based on case studies given to the group, for example solving the issue of a factless fact table • discuss solutions on a technical level • present obtained case studies solutions as part of the exercises **Self-competence** The students: • critically review provided data and information
Module contents	Data warehouse technology together with business intelligence are increasingly being used by business in order to get better decision support and enrich ongoing rocesses with data-rich decisions. Data warehouse technology enables an integration of data from heterogeneous sources, whether business intelligence builds data rocessing on top of it. For instance, business intelligence allows to build reporting on very large volumes of data (including historical) coming primary from data warehouse. **As past of the current module following contents are taught:**

- Definition and scope of business intelligence.
- Procedures and objectives of data warehousing.
- Process of extracting, transforming and loading (ETL) of data.
- Phases of data modelling, data capturing and reporting in conjunction with a plausible case studies/scenarios.
- Prospects for further and evolving topics for business intelligence (e.g. Adaptive Business Intelligence, In-MemoryComputing. etc.)
- Introduction to Data Mining.
- Case studies based practical exercises and assessments in order to impart practical knowledge.

Literaturempfehlungen

- Marx Gómez, Rautenstrauch, Cissek (2008): Einführung in die Business Intelligence mit SAP NetWeaver 7.0.
- Marx Gómez, Rautenstrauch, Cissek, Grahlher (2006): Einführung in SAP Business Information Warehouse, Springer, Heidelberg.
- Moss, Atre (2006): Business Intelligence Roadmap, Addison-Wesley, Boston.
- Loshin (2003): Business Intelligence, Kaufmann, Amsterdam.
- Müller, Lenz (2013): Business Intelligence.
- Sabherwal, Becerra-Fernandez (2010): Business Intelligence: Practices, Technologies, and Management

Links	http://www.wi-ol.de
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	annual
Module capacity	unlimited
Teaching/Learning method	1VL + 1Ü
Previous knowledge	none

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Written exam max. 120 minutes

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Exercises		2	WiSe	28
Präsenzzeit Modul insgesamt				56 h

inf607 - Business Intelligence II

Module label	Business Intelligence II
Modulkürzel	inf607
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Data Science • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik • Master's Programme Computing Science (Master) > Angewandte Informatik • Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction • Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction • Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering
Zuständige Personen	• Marx Gómez, Jorge (Prüfungsberechtigt) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	No participant requirement
Skills to be acquired in this module	Current module provides advanced business intelligence, data science with focus on enterprises and strong emphasis on big data and data analytics. Students of the course are provided with knowledge, which reflects current research and development in a data analytics domain. **Professional competence** The students: • name and recognize the role of data analytics / data science as past of a daily business process in a particular company • able to organize from managment perspective data analytis project • being able to analyse advantages and disadvantages of different approaches and methods of the data analytics and being able to apply them in simple case studies • obtain theoretical knowledge about data collection and modelling processes, including state of the art approaches and available best practices **Methodological competence** The students: • being able to execute typical tasks of data analytis, and also being able to proceed deeper with respect to different approaches and methods • gain a hans on experience and being able to understand advantages and disadvantages of different methods and being able to use obtained knowledge **Social competence** The students: • build solutions based on case studies given to the group, for example design of regression model based on provided dataset • discuss solutions on a technical level • present obtained case studies solutions as part of the exercises **Self-competence** The students: • critically review provided offered information
Module contents	After current course students will get advanced knowledge in the domains such as business intelligence and data analytics. Besides that, students will have a chance to have a deeper look into related technical fields such as InMemory Computing, Data Mining and Machine Learning, Big Data Processing with Distributed Systems (e.g. Apache Hadoop / Spark) from both, research and practical, perspectives. Students will be provided with real-world experience gather from business intelligence and data science related projects. Materials of the course are believed to be justified with current demands of data analytics market. Thus, providing students with relevant knowledge in order to give them advantages in future job.

Literaturempfehlungen

- Jürgen Cleve, Uwe Lämmel (2014): "Data mining" (Deutsch)
- Max Bramer (2013): "Principles of data mining" (English)
- Ian Witten, Eibe Frank, Mark Hall (2011): "Data mining : practical machine learning tools and techniques" (English)
- Jure Leskovec, Anand Rajaraman, Jeffrey Ullman (2014): "Mining of massive datasets" (English)

Links	http://www.wi-ol.de/
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	annual
Module capacity	unlimited
Teaching/Learning method	1VL + 1S
Previous knowledge	none

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Written exam (max. 120 min.)

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe	28
Exercises		2	SoSe	28
Präsenzzeit Modul insgesamt				56 h

inf980 - Introduction to Computer Science

Module label	Introduction to Computer Science
Modulkürzel	inf980
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	

- Bachelor's Programme Biology (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Biology (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Business Administration and Law (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Business Administration and Law (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Business Informatics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" more...
- Bachelor's Programme Business Informatics (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Chemistry (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Chemistry (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Comparative and European Law (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Comparative and European Law (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Computing Science (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Computing Science (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Economics and Business Administration (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Economics and Business Administration (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Education (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Education (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Engineering Physics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Engineering Physics (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Environmental Science (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Environmental Science (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Intercultural Education and Counselling (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Intercultural Education and Counselling (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Mathematics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Mathematics (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Physics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Physics (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Physics, Engineering and Medicine (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Physics, Engineering and Medicine (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Social Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Social Studies (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Sustainability Economics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"

- Bachelor's Programme Sustainability Economics (Bachelor) > Säule "Überfachliche Professionalisierung"
- Bachelor's Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich
- Dual-Subject Bachelor's Programme Art and Media (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Art and Media (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Biology (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Biology (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Chemistry (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Chemistry (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Computing Science (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Computing Science (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Dutch Linguistics and Literary Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Dutch Linguistics and Literary Studies (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Economic Education (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Economic Education (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Education (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Education (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Elementary Mathematics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Elementary Mathematics (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme English Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme English Studies (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Gender Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Gender Studies (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme General Education (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme General Education (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme German Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme German Studies (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme History (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme History (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-subject bachelor's programme Low German (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-subject bachelor's programme Low German (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Material Culture: Textiles (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Material Culture: Textiles (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Mathematics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Mathematics (Bachelor) > Säule "Überfachliche Professionalisierung"
- Dual-Subject Bachelor's Programme Music (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"

	• Dual-Subject Bachelor's Programme Music (Bachelor) > Säule "Überfachliche Professionalisierung" • Dual-Subject Bachelor's Programme Philosophy / Values and Norms (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Dual-Subject Bachelor's Programme Philosophy / Values and Norms (Bachelor) > Säule "Überfachliche Professionalisierung" • Dual-Subject Bachelor's Programme Physics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Dual-Subject Bachelor's Programme Physics (Bachelor) > Säule "Überfachliche Professionalisierung" • Dual-Subject Bachelor's Programme Politics-Economics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Dual-Subject Bachelor's Programme Politics-Economics (Bachelor) > Säule "Überfachliche Professionalisierung" • Dual-Subject Bachelor's Programme Protestant Theology and Religious Education (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Dual-Subject Bachelor's Programme Protestant Theology and Religious Education (Bachelor) > Säule "Überfachliche Professionalisierung" • Dual-Subject Bachelor's Programme Slavic Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Dual-Subject Bachelor's Programme Slavic Studies (Bachelor) > Säule "Überfachliche Professionalisierung" • Dual-Subject Bachelor's Programme Social Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Dual-Subject Bachelor's Programme Social Studies (Bachelor) > Säule "Überfachliche Professionalisierung" • Dual-Subject Bachelor's Programme Special Needs Education (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Dual-Subject Bachelor's Programme Special Needs Education (Bachelor) > Säule "Überfachliche Professionalisierung" • Dual-Subject Bachelor's Programme Sport Science (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Dual-Subject Bachelor's Programme Sport Science (Bachelor) > Säule "Überfachliche Professionalisierung" • Dual-Subject Bachelor's Programme Technology (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Dual-Subject Bachelor's Programme Technology (Bachelor) > Säule "Überfachliche Professionalisierung" • Fach-Bachelor Pädagogisches Handeln in der Migrationsgesellschaft (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" • Fach-Bachelor Pädagogisches Handeln in der Migrationsgesellschaft (Bachelor) > Säule "Überfachliche Professionalisierung" • Master Applied Economics and Data Science (Master) > Data Science • Master's Programme Environmental Modelling (Master) > Mastermodule
Zuständige Personen	• Vogel-Sonnenschein, Ute (module responsibility) • Vogel-Sonnenschein, Ute (Prüfungsberechtigt) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	Diese Modul wendet sich an Studierende in Studiengängen außerhalb der Informatik. Studierende des Departments für Informatik der Bachelor- und Master-Studiengänge Informatik und Wirtschaftsinformatik gehören nicht zur Zielgruppe.
Skills to be acquired in this module	Absolvent*innen des Moduls haben ein tiefergehendes Verständnis von grundlegenden Theorien und Techniken der Informatik erworben und können auftretende Probleme einordnen. Die Studenten werden damit befähigt, einfache Aufgabenstellungen aus ihrem Fachgebiet mit Mitteln der Informatik zu strukturieren, zu modellieren und Lösungsansätze zu entwerfen und den Lösungsaufwand abzuschätzen. Sie haben ein Grundverständnis für den Entwurf und den Einsatz von relationalen Datenbanken.
Module contents	• Computer representation of information • formal languages, grammar and automata • basic data structures; • problem solving paradigms, algorithms and complexity; • programming in the small (Language: Python) • basic concepts of data bases
Literaturempfehlungen	see literature lists in StudIP
Links	

Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jeweils im Wintersemester
Module capacity	unlimited
Reference text	Die Veranstaltung wird auf Englisch gehalten, wenn Studierende des Studiengangs Engineering of Socio-Technical Systems gibt, für die das notwendig ist. Die Vorlesungsfolien sind in Englisch.

Examination	Prüfungszeiten	Type of examination
Final exam of module		written or oral exam

- 2 weeks after the end of the lecture

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		3	WiSe	4
Exercises		1	WiSe	2
Präsenzzeit Modul insgesamt				6 h

inf040 - Introduction to Data Science

Module label	Introduction to Data Science
Modulkürzel	inf040
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Praktische Informatik und Angewandte Informatik • Bachelor's Programme Computing Science (Bachelor) > Akzentsetzungsbereich - Wahlbereich Informatik • Bachelor's Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich • Master Applied Economics and Data Science (Master) > Data Science • Master of Education Programme (Gymnasium) Computing Science (Master of Education) > Wahlpflichtmodule (Praktische Informatik) • Master of Education Programme (Gymnasium) Computing Science (Master of Education) > Wahlpflichtmodule (Theoretische Informatik) • Master of Education Programme (Hauptschule and Realschule) Computing Science (Master of Education) > Mastermodule • Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Akzentsetzungsbereich • Master's Programme Computing Science (Master) > Praktische Informatik
Zuständige Personen	• Wingerath, Wolfram (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	Basics of databases, Python programming and statistics
Skills to be acquired in this module	The module teaches fundamentals from the field of Data Science, covering purposes, challenges, and common best practices. **Professional competences** The students • have knowledge of basic concepts, problems and solution approaches from the field of Data Science. • are able to justify the choice of specific data analysis methods for a given problem • include possible imponderables in the analysis when evaluating analysis results **Methological competences** The students • are able to translate questions from a specific domain into a feasible analysis • work on Data Science tasks to expand their understanding of the different approaches and methods. **Social competences** The students • discuss approaches and problems encountered in smaller and larger groups **Self competences** The students • reflect on their actions when identifying possible solutions and critically question their own results
Module contents	

	Data Science is an interdisciplinary science at the intersection of statistics, machine learning, data visualization, and mathematical modeling. This course is designed to provide a practical introduction to the field of Data Science by teaching theoretical principles while also applying them practically. Topics covered range from data collection and preparation (data sources & formats, data cleaning, data bias), mathematical foundations (statistical distributions, correlation analysis, significance) and methods for visualization (tables & plots, histograms, best practices) to the development of models for classifying or predicting values (linear regression, classification, clustering).
Literaturempfehlungen	See description of the assigned course
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	regular in summer term
Module capacity	unlimited
Teaching/Learning method	V + Ü
Previous knowledge	Basics of databases, Python programming and statistics

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period or by arrangement with the instructor.	Written or oral exam or portfolio or project or practical exercise

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Exercises		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

inf962 - Fundamental Competencies in Computing Science III: Algorithms and Computational Problem Solving

Module label	Fundamental Competencies in Computing Science III: Algorithms and Computational Problem Solving
Modulkürzel	inf962
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Data Science • Master's Programme Engineering of Socio-Technical Systems (Master) > Fundamentals/Foundations • Master's Programme Environmental Modelling (Master) > Mastermodule
Zuständige Personen	• Vogel-Sonnenschein, Ute (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	No specific knowledge is required to take part in this module.
Skills to be acquired in this module	

Graduates of the module have acquired a deeper understanding of basic theories and techniques in computer science and can classify problems that arise. This enables students to structure and model simple tasks from their subject area using computer science, to design approaches to solutions and to estimate the effort required to solve them. They have a basic understanding of the design and use of relational databases.

This course provides students with fundamental computational problem-solving skills necessary to complete subsequent courses in computer science.

Professional competences
The students

- name the basic concepts of von Neumann's computer architecture,
- describe concepts of the computational representation of information and their limits,
- use basic data structures and algorithms and reason about their complexity,
- model simple problems with formal concepts such as automata and formal languages,
- design simple relational databases and identify the advantages of database-based storage.

Methodological competences
The students

- analyze problems from their area of application,
- design appropriate solutions for simple problems using the Python programming language and estimate the effort required to execute them,
- design simple object-oriented models
- use a simple IDE and implement scripts in Python,

- discuss alternative computational representations of data and problems and draw informed conclusions from them

Social competences
The students

- present and discuss their solutions in an interdisciplinary team,
- develop solutions to simple problems cooperatively in a team.

Self-competences
The students

- critically reflect on fundamental design decisions in algorithms and data structures,
- deepen their time management skills.

Module contents	

- von Neumann computer architecture,
- tasks of operating systems
- computer representation of information,
- formal languages, grammar and automata,
- basic data structures,
- algorithms and complexity,
- programming simple object-oriented solutions in Python
- basic concepts of SQL-based databases

Literaturempfehlungen	
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	every winter semester
Module capacity	unlimited
Reference text	This module provides students with non-computer science backgrounds with the computational problem-solving skills necessary to complete subsequent computer science courses. It is not intended for students with a computer science background.
Teaching/Learning method	1VL + 1Ü
Previous knowledge	none

Examination	Prüfungszeiten	Type of examination
Final exam of module		

- The exam takes place in the first three weeks after the end of the event period.
- The re-exam takes place in the last three weeks before the start of the next event period.

- Practical exercises and exams
  or
- Practical exercises and oral examination (with fewer than 20 participants)

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		3	WiSe	42
Exercises		1	WiSe	14
Präsenzzeit Modul insgesamt				56 h

Specialization

inf007 - Information Systems I

Module label	Information Systems I
Modulkürzel	inf007
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Bachelor's Programme Business Informatics (Bachelor) > Aufbaucurriculum - Pflichtbereich • Bachelor's Programme Computing Science (Bachelor) > Aufbaumodule • Bachelor's Programme Economics and Business Administration (Bachelor) > Studienrichtung Wirtschaftsinformatik • Dual-Subject Bachelor's Programme Computing Science (Bachelor) > Aufbaumodule (60 KP) • Master Applied Economics and Data Science (Master) > Specialization • Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Pflichtbereich
Zuständige Personen	• Wingerath, Wolfram (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	No participant requirement
Skills to be acquired in this module	This module introduces the core concepts, languages and architectures of databases. In software systems these concepts are important. **Professional competence** The students: • name the core concepts of the languages and architectures of databases (especially) • select data models • integrate structuring concepts of information systems in their designs **Methodological competence** The students: • design database systems appropriatelyanalyse problems from the field of database-supported • information systems and solve them appropriately **Social competence** The students: • enhance their ability to work in a team **Self-competence** The students: • reflect their problem-solving behaviour with regard to the information processing concepts
Module contents	• Relational data models • Relational algebra and its implementation in SQL (the standard of databases) • Database design on different abstractions (conceptual and logical design) • Normalisation - Data base architectures • Distributed and active databases • Object-oriented, object-related and XML-based database systems
Literaturempfehlungen	• Ramez Elmasri und Shamkant B. Navathe (2016), Fundamentals of Databases Systems, 7th Revised edition, Pearson/Addison Wesley.

Links				
Language of instruction		German		
Duration (semesters)		1 Semester		
Module frequency		annual		
Module capacity		unlimited		
Teaching/Learning method		V+Ü		
Previous knowledge		none		
Examination	Prüfungszeiten		Type of examination	
Final exam of module	At the end of the lecture period		Written or oral exam	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		3	WiSe	42
Exercises		1	WiSe	14
Präsenzzeit Modul insgesamt				56 h

inf008 - Information Systems II

Module label	Information Systems II
Modulkürzel	inf008
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Bachelor's Programme Business Informatics (Bachelor) > Aufbaucurriculum-Wahlbereich Praktische Informatik • Bachelor's Programme Computing Science (Bachelor) > Akzentsetzungsbereich - Wahlbereich Informatik • Bachelor's Programme Economics and Business Administration (Bachelor) > Studienrichtung Wirtschaftsinformatik • Master Applied Economics and Data Science (Master) > Specialization • Master of Education Programme (Gymnasium) Computing Science (Master of Education) > Wahlpflichtmodule (Praktische Informatik) • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
Zuständige Personen	• Grawunder, Marco (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	No participant requirement
Skills to be acquired in this module	The Module Information Systems II enhances the knowledge and the concepts of Information Systems I. **Professional competence** The students: • know further concepts, languages and architectures of databases • analyse advanced information processing tasks • analyse complex requirements of information systems appropriately • realize information requirements and gather relevant information **Methodological competence** The students: • propose concrete processing principles for special application classes • reflect specific technologies' consequences and proceedings **Social competence** The students: • improve their ability to work in a team **Self-competence** The students: • reflect their problem-solving behaviour with regard to extended information processing concepts
Module contents	• Implementation of databases (architecture, index structures, query processing and optimization) • Data integration and data analysis (data integration, data warehouses, data mining) • Information retrieval • Parallel databases
Literaturempfehlungen	Suggested reading: • Härder, T.,Rahm, E.:Datenbanksysteme -Konzepte und Techniken der Implementierung, Morgan Kaufmann • Raghu Ramakrishnan, Johannes Gehrke: Database Management Systems, McGraw-Hill • U. Leser, F. Naumann. Informationsintegration: Architekturen und Methoden zur Integration verteilter und heterogener Datenquellen. dpunkt • Bauer/Günzel. Data-Warehouse-Systeme, dpunkt • Han/Kamber/Pei. Data Mining: Concepts and Techniques, Morgan Kaufmann

Links				
Language of instruction		German		
Duration (semesters)		1 Semester		
Module frequency		annual		
Module capacity		unlimited		
Teaching/Learning method		V+Ü		
Previous knowledge		none		
Examination	Prüfungszeiten		Type of examination	
Final exam of module	At the end of the lecture period		written or oral Exam	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		3	SoSe	42
Exercises		1	SoSe	14
Präsenzzeit Modul insgesamt				56 h

inf109 - Information Systems III

Module label	Information Systems III
Modulkürzel	inf109
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Specialization • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik • Master's Programme Computing Science (Master) > Praktische Informatik
Zuständige Personen	• Grawunder, Marco (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	- Information Systems I - Information Systems II - JAVA
Skills to be acquired in this module	**Professional competence** The students: • describe concepts, languages and architectures of database systems • discuss state-of-the-art database research topics • analyse information processing tasks and implement solutions appropriately **Methodological competence** The students: • propose concrete processing requirements for special application classes • assess the consequences of techniques and approaches • perform supervised research in the field of information systems • analyse and reflect complex information system requirements • realize information demands and accordingly gather aim-oriented information **Social Competencies** The students: • solve problems partially in small groups • present solution proposals in front of the exercise group • discuss their different solution proposals withhin the exercise group **Self-competences** The students: • accept constructive criticism • reflect on their proposed solution considering the taugth methods
Module contents	This module is a continuation of the content of information systems I and of information systems II. It deepens and extends the contents of the preceding modules and focuses mainly on current research questions. A special focus lies on concept of distributed data management.
Literaturempfehlungen	• Özsu, M. Tamer; Valduriez, Patrick, Principles of distributed database systems • Rahm/Saake/Sattler: Verteiltes und Paralleles Datenmanagement, Springeer • Paper from SIGMOD, VLDB or ICDE
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	Winter semester
Module capacity	unlimited

Teaching/Learning method	1VL + 1Ü
Previous knowledge	- Information Systems I - Information Systems II - JAVA

Examination	Prüfungszeiten	Type of examination
Final exam of module	At the end of the lecture period	Written exam, oral exam or term paper

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Exercises		2	WiSe	28
Präsenzzeit Modul insgesamt				56 h

inf510 - Energy Information Systems

Module label	Energy Information Systems
Modulkürzel	inf510
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Specialization • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik • Master's Programme Computing Science (Master) > Angewandte Informatik • Master's Programme Environmental Modelling (Master) > Mastermodule
Zuständige Personen	• Lehnhoff, Sebastian (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	No participant requirements
Skills to be acquired in this module	The students will learn different approaches to integrate distributed facilities, the regulatory framework, relevant standards and architecture concepts of energy management systems and will be able to apply this knowledge. **Professional competence** The students: • develop and evaluate IT-architectures for energy management systems • model objects of this domain appropriately • model energy information systems • realise and differentiate advanced tasks of decentralised energy management systems **Methodological competence** The students: • identify problems of energy management, analyse these problems systematically and provide solutions • apply different simulation approaches of decentralised plants and consumers **Social competence** The students: • discuss solutions for energy management systems in the group • develop use cases in teams • present self-developed solutions **Self-competence** The students: • reflect their actions with regard to structuring and decomposing systems • reflect their own use of power as a limited resource
Module contents	This module provides the computer science basics for energy management. It provides the requirements of energy supply information systems with the focus on technical components and the requirements of decentralised and renewable energy plants. These are: • Architectures for energy information systems, e.g. SOA, Seamless Integration Architecture (IEC TC 57), OPC-UA • Norms and standards of energy industry data models (CIM, 61850) • Systematisation of energy information system requirements based on ontologies • Development, analysis and adaption of energy industry reference models and processes • Methods and technologies to support energy industry processes • Methods and algorithms to support decision processes of the decentralised energy plants control • Smart Grid plant communication, particularly for load management • Methods for modelling and simulation of power supply system dynamics

Literaturempfehlungen

- Crastan V.: "Elektrische Energieversorgung II", Springer 2004
- Heuck K., Dettman K. D., Schulz D.: "Elektische Energieversorgung I", 7. Aufl., Vieweg 2007
- Konstantin, P.: "Praxisbuch Energiewirtschaft", Springer 2006 - Schwab, A.: "Elektroenergiesysteme, Springer 2009

Links				
Language of instruction		English		
Duration (semesters)		1 Semester		
Module frequency		annual		
Module capacity		unlimited		
Teaching/Learning method		1VL + 1S		
Previous knowledge		none		
Examination	Prüfungszeiten		Type of examination	
Final exam of module	At the end of the semester		Student research project or presentation	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	WiSe	28
Seminar		2	WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir842 - Banking

Module label	Banking
Modulkürzel	wir842
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Specialization • Master of Education Programme (Vocational and Business Education) Economics and Business Administration (Master of Education) > Mastermodule • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule AFT - BWL • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL • Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
Zuständige Personen	• Prokop, Jörg (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	
Skills to be acquired in this module	Upon completion of the module students will be able to explain the role financial institutions play in financial markets based on economic theory. They will have a sound knowledge of institutional and regulatory conditions under which financial institutions operate today, and they will be able to critically assess respective developments in the financial sector. Moreover, they will have developed a sound understanding of how banks are managed in a competitive environment.
Module contents	We will discuss theoretical foundations of financial intermediation in general, and of banking in particular as well as the economic, institutional, and regulatory context in which financial institutions operate today. Moreover, we will cover selected topics in the area of bank management and bank accounting..
Literaturempfehlungen	• Arnold: Modern Financial Markets & Institutions: a practical perspective, latest edition, Pearson • Berger / Molyneux / Wilson (Eds.): The Oxford Handbook of Banking, latest edition, Oxford University Press • de Haan / Oosterloo / Schoenmaker: Financial Markets and Institutions – A European Perspective, latest edition, Cambridge • Hartmann-Wendels / Pfingsten / Weber: Bankbetriebslehre, latest edition, Springer • Tolkmitt: Neue Bankbetriebslehre, latest edition, Gabler Further readings may be announced during the course.
Links	http://www.uni-oldenburg.de/fiwi_bbl/
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	typically at the end of the semester; potential mid-term examination dates will be announced in the first session	1 term paper (Hausarbeit) or 1 written exam (Klausur) or 1 oral exam (mündliche Prüfung) or 1 Portfolio

Form of instruction	Lecture
SWS	4
Frequency	

wir843 - Financial Risk Management

Module label	Financial Risk Management
Modulkürzel	wir843
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Specialization • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule AFT - BWL • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL
Zuständige Personen	• Lehrenden, Die im Modul (Prüfungsberechtigt) • Prokop, Jörg (module responsibility)
Prerequisites	
Skills to be acquired in this module	The aim of the course is to provide students with a thorough knowledge of how to identify, classify, measure, and manage different types of financial business risks. In particular, we will discuss the properties and potential applications of derivatives in financial risk management. Upon completion of this module students • will have a sound understanding of the concept of risk management, and will be able to distinguish different types of financial risks and risk management approaches; • will be able to devise hedging strategies, arbitrage strategies, and speculative strategies using financial derivatives such as futures contracts, forward contracts, options, and swaps; • will be able to consistently apply valuation models to determine theoretical prices of financial derivatives. • will be able to assess limitations of financial derivatives in risk management.
Module contents	The course provides insights into the theory and practice of modern financial business risk management, including: • the concept of risk, types of financial risks, and approaches to risk measurement; • the mechanics of financial markets, including derivatives markets; • the properties of selected financial instruments, including financial derivatives such as forwards, futures, options, and swaps; • tools and techniques for managing financial risks.
Literaturempfehlungen	Highly recommended readings: • John C. Hull, Options, Futures, And Other Derivatives, current edition, Pearson. • Aswath Damodaran, Strategic Risk Taking: A Framework For Risk Management, Pearson 2008. Optional readings: • John C. Hull, Risk Management and Financial Institutions, latest edition, Pearson. • John C. Hull, Fundamentals of Futures and Options Markets, latest edition, Pearson. Further readings may be announced during the course.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	halbjährlich
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	typically at the end of the semester; potential mid-term examination dates will be announced in the first session	1 term paper (Hausarbeit) or 1 written exam (Klausur) or 1 oral exam (mündliche Prüfung) or 1 Portfolio

Form of instruction	Lecture (ggf. mit Übung)
SWS	4
Frequency	--

wir886 - Digital Transformation: Strategies and Sustainability

Module label	Digital Transformation: Strategies and Sustainability
Modulkürzel	wir886
Credit points	6.0 KP
Workload	180 h (4 SWS (56h))
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Specialization • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM-BWL • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - BWL • Master's Programme Sustainability Economics and Management (Master) > Additional Modules
Zuständige Personen	• Lehrenden, Die im Modul (Prüfungsberechtigt) • Hoppmann, Jörn (module responsibility)
Prerequisites	
Skills to be acquired in this module	The students should: • know basic definitions, trends and application areas of digitalization • be able to assess the economic effects of digitalization • understand corporate strategies and business models in the context of digital transformation • know how companies should design processes and structures to promote digitalization in organizations • have an overview of social, legal and ethical aspects of digitalization • assess the environmental impact of digitalization • evaluate digital products, services and business models using ethical and sustainable guidelines • independently develop proposals for the integration of ethical, social and ecological criteria in digitalization projects and processes
Module contents	The module "Digital Strategy and Sustainability" provides insights into the role digitalization for companies and the associated social discourse. The digital transformation leads to the emergence of new business models, markets and forms of interaction. This requires comprehensive changes in strategic orientation as well as in business processes and structures. In addition, new regulations and standards are required at the societal level in order to meet the ethical, ecological, and societal challenges posed by digitization. In the first part of the seminar, students are familiarized with the basics and application areas of digitalization as well as the economic, social, and ecological implications. Toward this end, important questions in the context of digital transformation will be raised and discussed drawing on company case studies. Exemplary questions that will be dealt with in this context are • What are the technological drivers of digitalization and what trends can be observed? • What is the impact of digital transformation on industries and companies? • How can companies design strategies, business models, processes and structures to address the digital transformation? • What are the consequences of digitalization on a societal and legal level? • How does the digital transformation affect the natural environment? • How can social, ethical, and ecological aspects be integrated into digital products, services and business models? In the second part of the course, students will develop digital business models in teams under the guidance of experienced coaches, taking into account economic, ecological and social/ethical criteria. The results are presented to the other students and company representatives and will be summarized in a term paper. An important part of the term paper is the critical reflection of current methods used to develop digital business models with regard to sustainability criteria.
Literaturempfehlungen	Platform Revolution: How Networked Markets Are Transforming the Economy – and How to Make Them Work for You | Geoffrey G. Parker, Marshall W. van Alstyne, Sangeet Paul Choudary | ISBN: 9780393249132 Machine, Platform, Crowd: Harnessing Our Digital Future | Andrew McAfee, Erik Brynjolfsson | ISBN-13: 978-0393254297
Links	
Language of instruction	English

Duration (semesters)		1 Semester		
Module frequency		Annually		
Module capacity		40		
Reference text		Das Modul sollte im 2. Semester besucht werden.		
Type of module		Wahlpflicht / Elective		
Module level		EB (Ergänzungsbereich / Complementary)		
Examination		Prüfungszeiten	Type of examination	
Final exam of module		Submission at the end of the semester	Assignment	
Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Exercises		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir896 - Operations Management

Module label	Operations Management
Modulkürzel	wir896
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Specialization • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - BWL • Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
Zuständige Personen	• Busse, Christian (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	
Skills to be acquired in this module	In der zum Modul gehörigen Vorlesung werden vor allem formalanalytische Modelle erarbeitet, mit denen Produktionsprobleme beschrieben und im Rahmen der Modellannahmen optimiert werden können. Hiermit sollen die Studierenden eine Kompetenz zur Analyse realer Produktionsprozesse erwerben, mit Hilfe derer sie diese nicht nur verstehen, sondern idealerweise auch verbessern können. Im begleitenden Seminar werden mithilfe von in Gruppen verfassten Hausarbeiten aktuelle Fragestellungen und Konzepte zu den formalanalytischen Modellen aufgearbeitet und bewertet. Das Seminar baut ergänzend zur Vorlesung auf konzeptioneller und empirischer Forschung auf. Hiermit lernen die Studierenden wissenschaftliche Diskurse zu praktisch relevanten und nur schwer modellierbaren Herausforderungen des Operations Managements kennen. Ferner werden die Fähigkeiten zum wissenschaftlichen Arbeiten, zur Teamarbeit und zum Präsentieren vor großen Gruppen trainiert.
Module contents	Die Vorlesung behandelt voraussichtlich folgende Themen: Nachfrageprognose, Prozessmanagement, Produktionsplanung, Ablaufplanung, Revenue Management, Behavioral Operations Management
Literaturempfehlungen	Thonemann, U. (2015). Operations Management – Konzepte, Methoden und Anwendungen. Pearson, Hallbergmoos. Helber, S. (2014): Operations Management Tutorial, Stefan Helber (Eigenverlag).
Links	https://www.uni-oldenburg.de/produktion
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	Am Ende des Semesters	Portfolio

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir898 - Strategic Sustainability Management

Module label	Strategic Sustainability Management
Modulkürzel	wir898
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Specialization • Master's programme Business Administration: Management and Law (Master) > Kernmodule CHI • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM-BWL • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL • Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master) • Master's Programme Sustainability Economics and Management (Master) > Akzentmodule
Zuständige Personen	• Hoppmann, Jörn (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Hoppmann, Jörn (Module counselling)
Prerequisites	
Skills to be acquired in this module	The students should... • know and understand basic concepts, instruments and theories in the context of corporate sustainability and corporate social responsibility • be able to apply conceptual frameworks to analyze and critically question the sustainability of companies • develop options to improve the sustainability of companies and derive recommendations for their implementation in practice
Module contents	The module "Strategic Sustainability Management" provides an overview of the debates on the role of firms for sustainable development from a strategic perspective. The first session will briefly introduce the historical debate on Corporate Sustainability and Corporate Social Responsibility and delineate important concepts. The following sessions will use concrete company case studies as a basis for a critical discussion of questions in the context of corporate sustainability that are of strategic importance for firms. Questions that will be discussed are, amongst others: • How can one determine whether a firm acts in a socially and ecologically sustainable way? • Which factors drive and hinder the diffusion of socially and ecologically superior solutions and companies in the market? • To which extent is there a conflict between firm and market growth on the one hand and sustainability on the other hand? • Which possibilities does a company have to deal with conflicts between social/ecological and economic goals? • How can existing firms and value chains be transformed toward sustainability? • What is the role of managers and boards of directors for organizational change toward sustainability? • How does the ownership and financial structure of firms influence their strategy toward sustainability? • In how far can cooperation and partnerships between organizations help integrate social and ecological aspects in 53 firms? In addition to discussing these questions by drawing on company case studies, students will be introduced to the corresponding theoretical concepts and frameworks in the academic literature. Also, students will be given the opportunity to test different strategies for implementing sustainability in organizations during a simulation, which allows them to gain first-hand insights into the emerging challenges. Toward the end of the course, students will apply and deepen the knowledge they have gathered over the semester by writing a seminar thesis.
Literaturempfehlungen	
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester

Module frequency			Yearly		
Module capacity			unlimited		
Examination		Prüfungszeiten		Type of examination	
Final exam of module		End of term		Portfolio	
Form of instruction	Comment		SWS	Frequency	Workload of compulsory attendance
Lecture			2	SoSe oder WiSe	28
Seminar			2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt					56 h

wir899 - Supply Chain Management

Module label	Supply Chain Management
Modulkürzel	wir899
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Specialization • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - BWL • Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
Zuständige Personen	• Busse, Christian (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt)
Prerequisites	
Skills to be acquired in this module	In der zum Modul gehörigen Vorlesung werden vor allem formalanalytische Modelle erarbeitet, mit denen Probleme in Wertschöpfungsketten beschrieben und im Rahmen der Modellannahmen optimiert werden können. Hiermit sollen die Studierenden eine Kompetenz zur unternehmensübergreifenden Analyse der gesamten Wertschöpfungskette (Supply Chain) erwerben, mit Hilfe derer sie diese nicht nur verstehen, sondern idealerweise auch verbessern können. Im begleitenden Seminar werden mithilfe von in Gruppen verfassten Hausarbeiten aktuelle Fragestellungen und Diskussionen im Supply Chain Management aufgearbeitet und bewertet. Das Seminar baut ergänzend zur Vorlesung auf konzeptioneller und empirischer Forschung auf. Hiermit lernen die Studierenden wissenschaftliche Diskurse zu praktisch relevanten und nur schwer modellierbaren Herausforderungen des Supply Chain Managements kennen. Ferner werden die Fähigkeiten zum wissenschaftlichen Arbeiten, zur Teamarbeit und zum Präsentieren vor großen Gruppen trainiert.
Module contents	Die Vorlesung behandelt voraussichtlich folgende Themen: Grundlagen der Supply Chain, Strategischer Fit, Netzwerk- und Standortplanung, Bestandsmanagement, Produkt- und Prozessdesign, Supply-Chain-Koordination, Vertragsdesign, Transport in der Supply Chain, Nachhaltiges Supply Chain Management
Literaturempfehlungen	Chopra, S. & Meindl, P. (2014). Supply Chain Management – Strategie, Planung und Umsetzung (5., aktualisierte Auflage). Pearson, Hallbergmoos. Thonemann, U. (2015). Operations Management – Konzepte, Methoden und Anwendungen. Pearson, Hallbergmoos. Bowersox, D. J.; Closs, D. J. & Cooper, M. B. (2002): Supply Chain Logistics Management. Boston. Ballou, R. H. (2004): Business Logistics / Supply Chain Management (5th ed.). Upper Saddle River. Monczka, R.; Trent, R. & Handfield, R. (2002): Purchasing and Supply Chain Management (2rd ed.). Mason: Thomson Learning.
Links	https://www.uni-oldenburg.de/produktion
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited

Examination	Prüfungszeiten	Type of examination
Final exam of module	Am Ende des Semesters	1 Hausarbeit oder 1 Referat oder 1 Klausur oder 1 mündliche Prüfung oder 1 Portfolio oder 1 Projektbericht

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir921 - Sustainable Supply Chain Management

Module label	Sustainable Supply Chain Management
Modulkürzel	wir921
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Master Applied Economics and Data Science (Master) > Specialization • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM-BWL • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL • Master's Programme Sustainability Economics and Management (Master) > Akzentmodule
Zuständige Personen	• Busse, Christian (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Busse, Christian (Module counselling)
Prerequisites	
Skills to be acquired in this module	By focusing on sustainability from an intra-, and inter-organizational perspective, this module aims to equip students with an in-depth knowledge of the sustainability-related challenges and problems within supply chain management and suggests some tools for managing the same. It further seeks to capacitate students to understand and analyze the trade-offs and conflicts of targets within sustainable supply chain management. The content is closely linked to the latest research in the field, providing a theoretical understanding (within the lecture) while using real-world case examples (within the seminar) to develop a practical understanding simultaneously. Students will be able to connect theory with practice and get a taste of real-life corporate scenarios or lay a foundation for possible master theses. Further, working in groups will help students brush up their team management skills, and the final report shall accustom them to the intricacies of scientific writing.
Module contents	This masters-level module focuses on how firms could practically manage sustainability in its supply chains. Two broader perspectives, as detailed below, guide the coursework: 1) The material flow perspective approaches SSCM with sustainably managing physical flows and processes within a firm's operations and upstream (and downstream) supply chain links. Individual (lecture) sessions are built around the following topics: Introduction to Sustainability and Supply Chain Management; Introduction to Sustainable Supply Chain Management; Sustainable Product Development & Lean and Green; Workplace Health and Safety; Sustainable Transportation; Sustainable Warehousing & Sustainable Packaging; and Closed-Loop Supply Chain Management 2) The relationship perspective further adopts a more direct managerial viewpoint on inter-firm relations. Individual (lecture) sessions discuss the following topics: Stakeholder Management; Legitimacy, Decoupling & Greenwashing; Supply Chain Sustainability Risks; Sustainable Supplier Management; and Supply Chain Sustainability Dilemmas Some of the theoretical perspectives discussed within the lecture sessions will be prepared by case studies of well-known companies such as Walmart, DHL, HP, Volkswagen, Lidl, and Apple.
Literaturempfehlungen	The lecture content has been developed from various research publications, rather than a textbook. Students are encouraged to read some of the original publications as amendments to the lecture. The case studies will mostly be based on professionally written cases. Scholarly publications/articles, as well as the case study documents, will be provided and discussed throughout the sessions.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	Yearly in the summer term
Module capacity	unlimited
Reference text	This module is offered in the summer term. For a more detailed description of course content and organization, please note the syllabus that will be made

available via Stud.IP before the beginning of the course.

Examination	Prüfungszeiten	Type of examination
Final exam of module		Portfolio

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SoSe oder WiSe	28
Seminar		2	SoSe oder WiSe	28
Präsenzzeit Modul insgesamt				56 h

wir806 - Information Technology Law

Module label	Information Technology Law
Modulkürzel	wir806
Credit points	6.0 KP
Workload	180 h
Verwendbarkeit des Moduls	• Bachelor's Programme Business Informatics (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft • Bachelor's Programme Computing Science (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft • Master Applied Economics and Data Science (Master) > Specialization • Master of Education Programme (Gymnasium) Computing Science (Master of Education) > Pflichtmodule • Master of Education Programme (Hauptschule and Realschule) Computing Science (Master of Education) > Mastermodule more... • Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Recht und Gesellschaft • Master's programme Business Administration: Management and Law (Master) > Basismodule • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - Recht • Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master) • Master's Programme Computing Science (Master) > Module aus anderen Studiengängen
Zuständige Personen	• Rott, Peter (module responsibility) • Lehrenden, Die im Modul (Prüfungsberechtigt) • Rott, Peter (Module counselling)
Prerequisites	not applicable
Skills to be acquired in this module	The students are familiar with the effects of digitalisation with its chances and risks in European and German private law and, in particular, consumer law. They obtain knowledge of specific areas of digitalised private law and consumer law with particular relevance for their future professional practice, are able to solve consumer law cases in a goal-oriented way, are able to find approaches for legal problems as well as recognise liability risks and how to deal with them, and are, in contract negotiations, able to recognise the requirements for regulation and to evaluate its consequences
Module contents	This module conveys how new technologies impact on private law and, in particular, on consumer law. It focuses on the (modified) interpretation of existing laws but even more on the reactions of the EU and national legislators and of the judiciary to new technological developments. The module discusses, among others, distance selling law, digitalised sales law and product liability law, the law of digital content and digital services, unfair commercial practices on internet and the law of the platform economy. Finally, the module looks at enforcement.
Literaturempfehlungen	to be announced in the first lecture
Links	
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Type of module	Wahlpflicht / Elective
Module level	MM (Mastermodul / Master module)
Teaching/Learning method	Lecture and Seminar
Previous knowledge	basic knowledge of civil law is helpful.

Examination	Prüfungszeiten	Type of examination
Final exam of module		to be taken from the examination regulations

Form of instruction	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Seminar		2		28
Präsenzzeit Modul insgesamt				56 h

Masterabschlussmodul

mam - Master´s Degree Module

Module label		Master´s Degree Module	
Modulkürzel		mam	
Credit points		30.0 KP	
Workload		900 h	
Verwendbarkeit des Moduls		• Master Applied Economics and Data Science (Master) > Masterabschlussmodul	
Zuständige Personen			
Prerequisites			
Skills to be acquired in this module			
Module contents			
Literaturempfehlungen			
Links			
Languages of instruction		German, English	
Duration (semesters)		1 Semester	
Module frequency			
Module capacity		unlimited	
Examination	Prüfungszeiten		Type of examination
Final exam of module			Abschlussarbeit
Form of instruction	Seminar		
SWS	2		
Frequency	SoSe oder WiSe		