Frankfurt School of Finance & Management
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Master Programme Course Selection
Summer Semester 2021

As an exchange student, you are able to choose **5 courses in total. You should choose courses <u>from one program only:</u>** MiM, MoF, MADS* or from the Electives.
Every module at Frankfurt School is worth **6 ECTS**.

Quarter Schedules

Quarter 3:	Academic period:	25 January – 20 March 2021
	Exam Week:	22 March – 27 March 2021
Quarter 4:	Academic period:	29 March –15 May 2021
	Exam Week:	17 May – 22 May 2021

Core Courses (you can choose courses from one program)

Master of Finance (MoF)		Master in Management (MiM)	
Responsible Management in Finance	Q3	Information systems	Q3
Financial Products & Modelling	Q3	Innovation Management	Q3
Risk Management	Q3	Strategic Management	Q3
Data Analytics & Machine Learning in Finance	Q4	Operations Management	Q4
Financial Markets & Institutions	Q4	Leadership & Organisational Behaviour	Q4

Master in Applied Data Sciences (MADS)	
Machine Learning 1	Q3
Visualising Big Data	Q3
AI & Humanity – the ethics of data science	Q4
Machine Learning 2	Q4

**MiM = Master in Management, MoF = Master of Finance, MADS= Master of Applied Data Sciences*

Please note that the present module catalogue is subject to change.

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Electives (for all MSc programmes, unless stated otherwise)

Q3	Q4
ESG Investing: People, Power, Profit	Advanced Mergers & Acquisitions *(prerequisite for this elective is that students register previously in M&A in Q3)*
Mergers & Acquisitions 1	Alternative Investments
Quantitative Trading and Analysis with Python	Applying Artificial Intelligence in Business (Online)
Practical Data Science and AI in Python	Intercultural Management
Entrepreneurship & Business Model Innovation in the 3D Printing Era	Organisational Design*
Insights into Manufacturing Industry	Sustainability and Ethics in Digital Transformation
Organisational Design*	

German language course: taking place every Wednesday both in Q3 and Q4.

Please note that not all elective modules are compatible with each other. In order to avoid clashes, the online platform will not allow you to choose incompatible modules.

** This course is spread over quarters 1 and 2!*

Responsible Management in Finance
[FIN72014]

Modulkoordinator	Andreicovici, Ionela				
Studiengang	MSc MF				
Studienabschnitt	Semester 2 Q3				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Macro & Monetary Economics, Foundations of Finance, Financial Products & Modelling; Financial Statement Analysis				
Kurzbeschreibung / Lerninhalte	Responsible management is all about reporting and using financial and non-financial information for business decision making in a responsible manner.				

Qualifikationsziele / Lernergebnisse	**Knowledge:** On successful completion of this module, students will have a thorough comprehension of the relevance of core concepts and approaches to responsible management in finance, e.g., they can: Become more aware of multiple stakeholder perspectives Understand that the impact of a company goes beyond its sphere Guide decision-making based on financial and non-financial data Illustrate corporate governance mechanisms **Skills:** On successful completion of this module, students will have the ability to apply advanced knowledge and related ethical concepts to an accounting and finance setting, e.g. they can: Critically assess ethical issues in accounting and finance and strategize solutions to solving them in practical terms Evaluate the ethical implications of strategic decisions Analyze the quality of a company's financial reports Identify reporting incentives and challenge assumptions about accounting quality Understand the fundamentals of insider trading Assess how a manager can ensure that ESG issues are considered in business decisions Identify corporate governance mechanisms Conduct independent empirical investigations **Competences:** On successful completion of this module, students can responsibly transfer these concepts and methods to typical management situations in the accounting and finance industry, e.g. they can: Make informed and ethically responsible business decisions
Lernformen, Methodik und Betreuung	The basic format of the classes in Frankfurt consists of lectures and case study discussions. Classes will generally start with an introduction to the main topic at hand, followed by case studies and empirical investigations. The course also comprises an offsite in Luxembourg in April 2020.
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	Participation Luxembourg Offsite: 5 performance points Class Participation: 15 performance points Group Assignment/Presentation: 40 performance points Written Exam: 60 performance points - 60 minutes + 10 minutes reading time

Literaturhinweise	**Course material:** We do not use a required textbook in this course. Pre-reading materials, slides, and other materials designed to offer support throughout the entire lecture are made available before the module starts.
Modulstruktur	**The following topics are covered in this course:** Shareholders vs. stakeholders Introduction to Stata Financial reporting quality/Earnings management Tax planning Insider trading Environmental Social and Governance Corporate governance structures
Verwendbarkeit für andere Module und Programme	Interdisciplinary knowledge of this module can be used within various other modules. Master's Thesis
Letztes Freigabedatum	23.01.2020

Financial Products & Modelling [FIN71570]

Modulkoordinator		Vilkov, Grigory			
Studiengang		MSc MF			
Studienabschnitt		-			
Moduldauer		-			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		None			
Kurzbeschreibung / Lerninhalte		Financial Markets • Trading, Instruments, Participants, and Mechanics • Regulatory Framework Financial Products • Discrete-Time Valuation Framework • Equity Derivatives • Valuation of Fixed Income Instruments • Interest Rate Derivatives • Credit Derivatives Introduction to Excel and VBA • General Intro • Using Excel for Pricing and Risk Management Bloomberg Market Concepts certification			

Qualifikationsziele / Lernergebnisse	*Knowledge:* On completion of this model, students will be able to express substantial knowledge on financial products and modelling, i.e., they can: • Describe the organization and functionality of financial markets and their regulatory framework • Identify the most relevant financial instruments for a specified purpose *Skills:* On successful completion of this model, students will have the proven ability to apply learned methods to the financial products and modelling framework, e.g., they can: • Analyze financial markets and evaluate financial instruments of different levels of complexity • Develop an appropriate solution for a given financial risk situation and know how to implement the solution using various financial instruments • Evaluate financial instruments with required standard and non-standard features *Competence:* On successful completion of this model, students will have acquired the competence to: • Evaluate and manage complex financial instruments to adequately solve financial risk management problems • Assume a responsible position in the area of financial risk management, investment banking, asset management or corporate finance
Lernformen, Methodik und Betreuung	Lectures, applied tutorials for Excel, online certification for Bloomberg (BMC)
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-

Literaturhinweise	*Extensively used in the course* • Sundaram, Rangarajan K. and Sanjiv Das, Derivatives: Principles and Practice, Mcgraw Hill Book 2010 • Mary Jackson, Mike Staunton, Advanced Modelling in Finance using Excel and VBA, John Wiley & Sons 2001 *Useful as additional reference* • Hull, John C : Options, Futures and other Derivatives,7th ed., Pearson, 2008 • Wilmott, Paul P.: Wilmott introduces Quantitative Finance. 2nd ed., John Wiley & Sons, 2007 • Teall, John L., Financial Trading and Investing, Academic Press 2012 • Bill Dalton, Financial Products: An Introduction Using Mathematics and Excel, Cambridge University Press 2008
Modulstruktur	24hrs Financial Products 12hrs Excel Training Online Bloomberg Market Concepts This module discusses the most important financial instruments. These include stocks, bonds and derivatives like swaps, futures, options, and credit derivatives. For all instruments we will clarify the intermediate and final cash flows, introduce basic valuation methods and discuss possible applications. The module also discusses variants and rules of securities trading as well as the organization and functionality of securities exchanges and over-the-counter markets.
Verwendbarkeit für andere Module und Programme	Subsequent modules
Letztes Freigabedatum	28.02.2018

Risk Management [FIN71030]

Modulkoordinator		Sannino, Francesco			
Studiengang		MSc MF			
Studienabschnitt		Semester 2			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Foundations of Finance, Statistics & Econometrics, Microsoft Excel			
Kurzbeschreibung / Lerninhalte		• Introduction (role of bank capital, overview of financial risk management) • Risk factors and risk mapping • Risk measures and Value-at-Risk • Market risk: Computing Value-at-Risk • Credit Risk and Credit Value-at-Risk • Economic capital and RAROC • Regulation and Basel II/II.2/III • Related topics and applications			

Qualifikationsziele / Lernergebnisse	*Knowledge:* On successful completion of this module, students will have a thorough comprehension of the basic definitions, theories and concepts of risk management, i.e. they can: • Explain how to manage and hedge trading book exposures • Summarize and discuss regulatory requirements • Validate how risk management supports to assure a bank's profitability *Skills:* On successful completion of this module, students will have the proven ability to apply risk measurement and risk management concepts for bank management purposes, i.e. they are able to: • Calculate various risk measures • Evaluate the impact of risk on prices for financial products and services • Apply risk measurement and risk management concepts for bank management purposes • Design instruments for a bank-wide risk management *Competence:* On successful completion of this module, students recognise the importance of risk management in a financial institution and are capable of acting as the interface between risk managers and other bank departments
Lernformen, Methodik und Betreuung	Lectures, in-class exercises, homework, case studies, presentations, written exam
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-
Literaturhinweise	• Hull, J.: Risk Management and Financial Institutions. Pearson Prentice Hall, 2007 Additional literature will be given in class

Modulstruktur	The module covers the foundations of risk management, with a special focus on market risk and credit risk. The importance of risk management for capital management and bank governance is stressed. Sev-eral techniques for computing standard risk measures (PVBP, Value-at-Risk) are taught and applied. Risk-adjusted profitability measures such as RAROC are considered. Techniques for allocating capital to individual business units are presented. Finally, the course covers regulatory aspects with a focus on Basel II and market risk. The aim of the module is: • To understand the importance of risk management in a bank/financial institution for regulatory purposes and for man-agement purposes • To understand how financial products are used for hedging • To understand how risk is measured on a bank-wide level
Verwendbarkeit für andere Module und Programme	Subsequent modules in all Concentrations
Letztes Freigabedatum	26.01.2018

Data Analytics and Machine Learning in Finance [FIN72017]

Modulkoordinator	Wheeler, Gregory				
Studiengang	MSc MF				
Studienabschnitt	Semester 2 Q3				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Statistics & Econometrics, Python				
Kurzbeschreibung / Lerninhalte	Advanced data analytics employs techniques from machine learning and artificial intelligence to sift through large and even unstructured data to reveal patterns and identify trends to yield more accurate judgments and better-informed decisions. The aim of machine learning is to make a computer learn from data without explicitly programming it how to do so, and the fruits of machine learning are all around us: email spam filters classify your messages, postal services read and route billions of hand-written letters every month, online businesses recommend products to customers, and speech-to-text transcribers now match the accuracy of human transcribers opening the possibility of real-time language translation – all using contemporary machine learning techniques. Financial institutions increasingly apply these very same techniques to an expanding range of problems, leveraging an increasing volume of data through daily operations and third-party sources to manage portfolio risk, perform trades, detect fraud, comply with regulations, and much, much more. This course is a hands-on introduction to contemporary regression-based techniques in machine learning, with a focus on supervised learning algorithms (used to make accurate predictions about the future from current data) and unsupervised learning (used to discover unknown structure in your current data). Because applications in this field are fast moving, the focus of this course is to give students a working understanding of core ML techniques backed by a solid theoretical understanding of how these algorithms work.				

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On the successful completion of this module, students will have a rudimentary understanding of regression-based techniques in machine learning, with a focus on supervised learning algorithms (used to make accurate predictions about the future from current data) and unsupervised learning (used to discover unknown structure in your current data).

Skills:
Upon the successful completion of this module, students will have a hands-on experience implementing several core machine learning algorithms used in data analytics.
Specifically, upon successful completion of the programming assignments for the course, students will have fully working implementations of

- Single and Univariate Regression models
- Gradient Descent for multiple features
- Logistic regression for multiple features
- CART models
- Time Series Analysis & Forecasting
- A complete Neural Network, including implementations of a neural network cost function and back propagation for non-linear classification
- K-means clustering

Competencies:
The course is designed to be a hands-on introduction to machine learning. To that end, students who successfully complete the course will be able to pursue two tracks:

- Students will have a rudimentary but working knowledge of how contemporary ML algorithms work, enabling them to be informed “citizen analysts” and to collaborate with data science teams.
- Students without prior experience but with an interest to pursue studies in data science will be prepared to study an introduction to machine learning course in a computer science department or to follow one of several technical online courses in ML, statistics and data science.

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<tr><td>Lernformen, Methodik und Betreuung</td><td>

The course will consist in theoretical lectures, where theory and programming tips are covered, and tutorials, where students will begin work on that week’s programming assignment, which will be completed outside of class.

In addition to the Professor, there will the Teaching Assistants for the course available to help students.

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<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Five (5) Programming Assignments</td><td>tbd</td><td>70</td><td>During the module</td></tr>
<tr><td>Written exam</td><td>50 min</td><td>50</td><td>Written exam</td></tr>
</table>

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Literaturhinweise	We will use the following resources: • Gregory Wheeler (2020) “Lecture Notes for Machine Learning.” Available from the course website • Michael A. Nielsen (2015), Neural Networks and Deep Learning. Determination Press.Url: http://neuralnetworksanddeeplearning.com/ In addition, for programming tips in Python, students may wish to consult • Wes McKinney (2013), Python for Data Analysis. Sebastopol, CA: O’Reilly.
Modulstruktur	The module structure consists of four components: 1. Preparation for each lecture by reading the assigned material prior to class 2. Attend all tutorials with a laptop with all software installed and ready prior to class 3. Complete all programming assignments and submit them on-time and in the correct format 4. A final exam
Verwendbarkeit für andere Module und Programme	Subsequent modules in all concentrations
Letztes Freigabedatum	21.01.2020

Financial Markets and Institutions [FIN72018]

Modulkoordinator		Fecht, Falko			
Studiengang		MSc MF			
Studienabschnitt		Semseste 2 Q4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Other core modules			

Kurzbeschreibung / Lerninhalte	This course deals with the economic role of different financial institutions. In the first part we will focus on traditional banks. We will discuss frictions in financial markets that allows banks to add value as an intermediary. We will also analyse how banks add value in mitigating these market frictions. Based on these insights we will study why banks are fragile and affected by financial contagion. This permits us then to assess thoroughly how the government in general can alleviate the consequences of financial crises. For instance, we will study how the central bank can act as a lender of last resort to prevent liquidity crises. Furthermore, we evaluate different measures to assess and strengthen the resilience of financial institutions, such as capital and liquidity regulation and stress testing. In this regards, we will also discuss how the European banking union affects the Euro area's financial system. The second part is devoted to other financial intermediaries. Here we will first discuss the shadow banking sector in general. We will analyse how the shadow banking sector, in contrast to traditional banks, channels funds from savers to borrowers and which financial institutions are involved in this process. We will study how the different entities of the shadow banking sector help mitigate financial market frictions and add value. Besides this we will also learn about the risks inherent in the shadow banking sector and discuss mechanisms that can lead to financial contagion among these financial institutions. Finally, we analyse how financial innovations change banks' business models and how they change the interplay between banks and other financial institutions, in particular shadow banks and FinTechs. ---
Qualifikationsziele / Lernergebnisse	Upon completion of the course, students have a solid understanding of the role of different financial institutions and of the key drivers of structural changes in the financial sector. They are able to evaluate how financial institutions are affected by a changing environment. More specifically, students have a thorough knowledge of threats to the stability of individual financial institutions and of mechanisms endangering the resilience of large parts of the financial system. In addition, students understand the reasons for financial regulations enabling them also to assess the consequences of regulatory changes for the financial industry.
Lernformen, Methodik und Betreuung	• Lecture • In-class exercises • Case studies • Student presentations

<table>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Case study (paper and presentation):</td><td>tbd</td><td>60</td><td>During the module</td></tr>
<tr><td>Written exam</td><td>60 minutes</td><td>60</td><td>Exam week</td></tr>
</table>

Type of examination Duration or length Performance Points Due date or date of exam
Case study (paper and presentation): tbd 60 During the module
Written exam 60 minutes60 Exam week

</td></tr>
<tr><td>Literaturhinweise</td><td>

Greenbaum, Stuart I. and Thakor, Anjan V. 2007. Contemporary Financial Intermediation, 2. edition, Academic Press, Parts I, II, III, V, & VI.
European Central Bank. 2014. "Fire Sale Externalities." Financial Stability Report, November 2014, pages 99-109.
Bakk-Simon, Klára, Stefano Borgioli, Celestino Giron, Hannah Sabine Hempell, Angela Maddaloni, Fabio Recine, and Simonetta Rosati (2012) Shadow banking in the Euro area: an overview, European Central Bank, Occasional paper 133.
Morrison, A. D. and W. J. Wilhelm (2007) Investment Banking – Institutions, Politics, and Law, Oxford University Press. (especially chapters 1-3).
Gorton, Gary and Matrick, Andrew. (2010) Hair cuts, Federal Reserve Bank of St. Louis Review, November/December 2010, 92 (6), pp. 507-19.

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<tr><td>Modulstruktur</td><td>

Introduction
Frictions in Financial Markets
The Role of Banks in Corporate Lending
Banks as Liquidity Insurance
Fragility of the Banking Sector
Government Intervention in the Banking Sector
Banking Regulation
The Shadow Banking Sector
Investment Bank
Financial Innovations and FinTechs

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<tr><td>Verwendbarkeit für andere Module und Programme</td><td>Master's Thesis</td></tr>
<tr><td>Letztes Freigabedatum</td><td>12.02.2019</td></tr>
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Machine Learning I [INF72010]

Modulkoordinator		Wheeler, Gregory			
Studiengang		MSc MADS			
Studienabschnitt		3rd Quarter			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Semester 1,, Python			
Kurzbeschreibung / Lerninhalte		Advanced data analytics employs techniques from machine learning and artificial intelligence to sift through large and even unstructured data to reveal patterns and identify trends to yield more accurate judgments and better-informed decisions. The aim of machine learning is to make a computer learn from data without explicitly programming it how to do so, and the fruits of machine learning are all around us: email spam filters classify your messages, postal services read and route billions of handwritten letters every month, online businesses and recommend products to customers, and speech-to-text transcribers now match the accuracy of human transcribers opening the possibility of real-time language translation - all using contemporary machine learning techniques. Financial institutions increasingly apply these very same techniques to an expanding range of problems, leveraging an increasing volume of data through daily operations and third-party sources to manage portfolio risk, perform trades, detect fraud, comply with regulations, and much, much more. This course is hands-on introduction to contemporary regression-based techniques in machine learning, with a focus on supervised learning algorithms (used to make accurate predictions about the future from current data) and unsupervised learning (used to discover unknown structure in your current data).			

Qualifikationsziele / Lernergebnisse	*Knowledge*: On successful completion of this module, students will have a rudimentary understanding of regression-based techniques in machine learning, with a focus on supervised learning algorithms (uses to make accurate predictions about the future from current data) and unsupervised learning (used to discover unknown structure in your current data). *Skills:* Upon the succesful completion of this module, students will have a hands-on experience implementing several core machine learning algorithms used in data analytics. Specifically, upon successful completion of the programming assignments for the course, students will have fully working implementations of • Single and Univariate Regression models • Gradient Descent for multiple features • Logistic regression for multiple features • CART models • Time Series Analysis & Forecasting • A complete Neural Network, including implementations of a neural network cost function and back propagation for non-linear classification • K-means clustering *Competencies:* The course is designed to be a hands-on introduction to machine learning. To that end, students who successfully complete the course will be able to pursue two tracks: • Students will have a rudimentary but working knowledge of how contemporary ML algorithms work, enabling them to be informed "citizen analysts" and to collaborate with data science teams. • Students without prior experience but with an interest to pursue studies in data science will be prepared to study an introduction to machine learning course in a computer science department or to follow one of several technical online courses in ML, statistics and data science.
Lernformen, Methodik und Betreuung	The course will consist in theoretical lectures, where theory and programming tips are covered, and tutorials, where students will begin work on that week`s programming assignment, which will be completed outside of class. In addition to the Professor, there will the Teaching Assistants for the course available to help students.
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-

Literaturhinweise	We will use the following resources: • Gregory Wheeler (2020) “Lecture Notes for Machine Learning.” Available from course website. • Michael A. Nielsen (2015), Neural Networks and Deep Learning. Determination Press. Url: http://neuralnetworksanddeeplearning.com/ In addition, for programming tips in Python, students may wish to consult 1. Wes McKinney (2013), Python for Data Analysis. Sebastopol, CA: O’Reilly
Modulstruktur	The module structure consists of four components: 1. Preparation for each lecture by reading the assigned material prior to class 2. Attend all tutorials with a laptop with all software installed and ready prior to class 3. Complete all programming assignments and submit them on-time and in the correct format 4. A final exam
Verwendbarkeit für andere Module und Programme	Subsequent modules
Letztes Freigabedatum	16.09.2020

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Visualising Big Data [INF72020]

Modulkoordinator	Tomak, Kerem				
Studiengang	Master in Applied Data Science				
Studienabschnitt	3rd Quarter				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Modules Computation Semantics: Data Structures and Algorithms has to be covered.				
Kurzbeschreibung / Lerninhalte	In this course we will study techniques and algorithms for creating effective visualizations based on principles and techniques from graphic design, visual art, perceptual psychology and cognitive science. The course is targeted both towards students interested in using visualization in their own work, as well as students interested in building better visualization tools and systems. In addition to participating in class discussions, students will have to complete several short visualization and data science assignments as well as a final programming project.				
Qualifikationsziele / Lernergebnisse	*Knowledge:* On successful completion of this module, students will have thorough comprehension of big data strategy implementation, i. e. they: • Can explain the benefits and limitations of different data visualization techniques. • Can explain use of big data in visualizations that drive business results. • Can understand and explain big data technology architecture in support of efficient information generation and distribution *Skills:* On successful completion of this module, students will have a thorough comprehension of big data strategy implementation, i. e. they: • Can extract information from large datasets, using a visualization tool • Can effectively use visualization tools to "tell stories" *Competence:* Upon completing the course, students will have the ability to create an end-to-end visualization delivery to support a business outcome/story.				
Lernformen, Methodik und Betreuung	Lectures, programming assignments, and exam.				

<table>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date or Date of Exam</td></tr>
<tr><td>Data processing and creating visualization</td><td>in class</td><td>40</td><td>in class</td></tr>
<tr><td>Programming assignments- Managing & Visualisuing</td><td>in class</td><td>40</td><td>in class</td></tr>
<tr><td>Final Exam</td><td>45 min</td><td>40</td><td>during exam week</td></tr>
</table>
</td></tr>
<tr><td>Literaturhinweise</td><td>

Yau, N.(2013) Visualisation that means something O`Reilly
Data Science for Business by Foster provost and Tom Fawcett
Data Visualisaiton with R: 100 examples by Thomas Rahlf
Show me the numbers: Designing Tables and Graphs to Enlighten by Stephen Few
Information Dashboard Design: Displaying Data for At-a-Glance Monitoring by Stephen Few
The Dos and Don`ts of Presenting Data, Facts, and Figures by Dona Wong

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<tr><td>Modulstruktur</td><td>Session Topic
1 The Purpose of Visualization
2 Data and Image Models Intro to Tableau
3 Visualization Design
4 Exploratory Data Analysis
5 Perception
6 Interaction
7 Data Science and AI Architecture to support visual delivery
8 Using Space Effectively: 2 D
9 Visual Explainers
10 Deconstructing Visualizations
11 Color
12 Graph Layout
13 Project Presentations</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>All subsequent courses, Master's Thesis</td></tr>
<tr><td>Letztes Freigabedatum</td><td>18.06.2020</td></tr>
</table>

AI & Humanity - Ethics of Data Science
[INF72030]

Modulkoordinator	Köhler, Sebastian				
Studiengang	Master in Applied Data Science				
Studienabschnitt	4th Quarter				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Previous module				
Kurzbeschreibung / Lerninhalte	This module explores ethical and legal challenges and questions that data scientists are likely to face in their professional lives working with and developing emerging information technologies. Issues that will be considered are, for example, privacy, responsibility, fairness, how such technologies impact the flow of information and what increasing automatization might mean for society. Participants will gain an in-depth comprehension of ethical and legal issues surrounding the work of data scientists and emerging information technologies, as well as the crucial ethical and legal questions that we should ask about such technologies. On successful completion of this module, students should have developed and strengthened their analytic and critical skills, as well as their ability to apply those skills to ethical and legal problems to develop solutions to those problems.				

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge: On successful completion of this module, students will have a thorough comprehension of central legal and ethical issues surrounding information technologies, as well as the crucial legal and ethical questions we must ask about such technologies, i.e. they can

- explain what ethical and legal questions information technologies raise for issues such as privacy, responsibility, or fairness.
- articulate what kinds of answers have been given to such ethical and legal questions and how those answer are supported.
- compare different responses to the relevant ethical and legal questions.

Skills: On successful completion of this module, students will be able to identify and evaluate legal and ethical problems related to information technologies, develop and critically assess appropriate responses to such problems, and to assess their own evaluative outlook critically, i.e. they can

- identify ethical and legal issues that information technologies raise and articulate and defend their own responses to these issues.
- critically assess arguments for and against positions taken in response to ethical and legal issues raised by information technologies.
- identify and reflect on evaluative assumptions presupposed by arguments made for or against particular uses of information technologies.

Competencies: On successful completion of this module, students should have developed and strengthened their analytic and critical skills, as well as their ability to apply those skills to ethcial and legal problems to develop solutions to those problems, i.e. they can

- anticipate and articulate legal and ethical issues that might be raised by novel technologies.
- articulate, develop, and defend novel responses on ethical and legal questions that are raised by various technologies.

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<tr><td>Lernformen, Methodik und Betreuung</td><td>Practical seminar with critical reflection</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><th>Type of Assessment</th><th>Duration</th><th>Performance Points</th><th>Due Date or Date of Exam</th></tr>
<tr><td>Argumentative exercises</td><td>tbd</td><td>30</td><td>during term</td></tr>
<tr><td>Discussion essay</td><td>tbd</td><td>30</td><td>during term</td></tr>
<tr><td>Independently researched essay</td><td>tbd</td><td>30</td><td>during term</td></tr>
<tr><td>Essay on legal issues</td><td>tbd</td><td>30</td><td>during term</td></tr>
</table>

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</table>

Literaturhinweise	• Boddington, Paula 2017. Towards a Code of Ethics for Artificial Intelligence, Berlin: Springer • Vollmann, Jeff and Matei, Sorin Adam (Eds.) 2016. Ethical Reasoning in Big Data, Berlin: Springer • Lin, Patrick, Jenkins, Ryan and Keith, Abney (Eds.) 2017. Robot Ethics 2.0, Oxford: Oxford University Press • Shafer-Landau, Russ 2015. The Fundamentals of Ethics, Oxford: Oxforl University Press
Modulstruktur	1. The Law & AI • Data Protection Law • Pioneering in Cyberspace and Cyberlaw 1. Ethics & AI • Introduction to Ethics & Philosophical Methodology • Privacy, Anonymity, Consent, and Data Ownership • Algorithms and the Flow of Information: Filter Bubbles and Deception • Fairness, Justice, and Discrimination • Accountability, Explainability and Ethical AI • Automatization and Humanity`s Future
Verwendbarkeit für andere Module und Programme	AI The New Frontier
Letztes Freigabedatum	18.06.2020

Machine Learning II [INF72040]

Modulkoordinator	Nagler, Jan				
Studiengang	Master in Applied Data Science				
Studienabschnitt	4th Quarter				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Deutsch				
Workload: 150 h	Präsenz:	44 h	Selbststudium:	106 h	
Voraussetzungen für die Teilnahme	Quantitative Fundamentals & Machine Learning I				
Kurzbeschreibung / Lerninhalte	This course is an introduction to statistical machine learning and probabilistic data analysis involving highly parameterized models. Topics include time series analysis and variational inference.				
Qualifikationsziele / Lernergebnisse	*Knowledge:* On the successful completion of this module, students will have thorough hands-on experience implementing with standard statistical machine learning tools, in particular supervised and unsupervised machine learning models. Specifically, they knowledge • will have a deeper understanding of the mathematical and statistical foundations of machine learning • will have a better appreciation of the computational challenges to performing statistical inference on high-dimensional data • can explain the role that MCMC and sampling techniques play in approximate Bayesian inference *Skills:* • can implement sophisticated MCMP methods regression problems; • can build an ensemble of machine learning techniques to solve a complicated, real-world problem.				
Lernformen, Methodik und Betreuung	Lecture and programming assignments				

<table>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date or Date of Exam</td></tr>
<tr><td>Five (5) Programming Assignments</td><td>tbd</td><td>70</td><td>During Module</td></tr>
<tr><td>Final Exam</td><td>50 min</td><td>50</td><td>Exam Week</td></tr>
</table>
Graded Programming Assignments and Final Exam.
</td></tr>
<tr><td>Literaturhinweise</td><td>

- Kevin P. Murphy (2012), Machine Learning: A Probabilistic Perspective, MIT Press.

</td></tr>
<tr><td>Modulstruktur</td><td>

1. Regression, Regularization & Preprocessing
   a. Correlation-based dimensionality reduction
   b. Principle Component Analysis (PCA)
   c. Regularization
2. Bayesian Methods
   a. Latent Variables Models
   b. Expectation Maximization (EM)
   c. Variational Inference & Sampling (Gibbs & Metropolis)
   d. Markow Chain Monte Carlo (MCMC)
   e. Gaussian Mixture Model
   f. Hidden Markow models (HMM)
3. Supervides and Unsupervised Learning: Applications, Tools & Libraries

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<tr><td>Verwendbarkeit für andere Module und Programme</td><td>Co-op Project and thesis</td></tr>
<tr><td>Letztes Freigabedatum</td><td>18.06.2020</td></tr>
</table>

Information Systems [MGT71430]

Modulkoordinator		Beimborn, Daniel			
Studiengang		MSc MiM			
Studienabschnitt		Semester 2			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Basic knowledge about business information systems, as taught in undergraduate programs in business Administration.			

Kurzbeschreibung / Lerninhalte	The “Information Systems" module aims at establishing the foundations required for managing information systems in a business environment. The course introduces and refreshes participants’ knowledge about fundamental concepts of IT infrastructure and applications, including recent trends such as cloud computing or enterprise social media. This basic knowledge is then reflected by applying theories from strategic management as lens to evaluate their “value” in terms of their potential for contributing to a firm’s strategic goals. Building on these foundations, general principles of IT strategy, IT governance, and different models of IT value generation will be introduced and discussed. The students will learn about the different roles in IT management, different ways to structure the IT function and the common approaches to organize IT operations and services. The course will follow the subsequent agenda (changes might apply): • *The IT Resource*: defining IT and information systems (IS). Overview about different types of technologies, information systems, trends. The resource-based view of IT, IT assets. • *IT strategy*: Types of IT strategy, developing an IT strategy, aligning the IT strategy with the business strategy • *IT Architecture*: Fundamentals of IT architecture and Enterprise Architecture Management (EAM) • *IT Governance*: Role of the CIO. Setting up an IT organization. Discussing different paradigms and approaches of managing IT • *IT Operations*: Basics about IT operations and IT service management as well as “IT controlling”, including the widely used frameworks of ITIL and COBIT. Management of outsourcing and offshoring arrangements.

Qualifikationsziele / Lernergebnisse	*Knowledge:* On successful completion of this module, students will have a thorough comprehension of different concepts, approaches and technologies in the field of managing corporate information systems, i.e. they can: • Describe the relevance, technologies, and management of information systems • Outline the relation between IT strategy, business/IT alignment, IT architecture, IT organization, and IT operations • Identify different roles in IT management • Illustrate the common approaches to organize IT operations and services *Skills:* On successful completion of this module, students will have the proven ability to apply skills for analyzing management questions regarding choice of technologies, for developing IT strategies that support the goals of their firm, for structuring the IT governance, and for establishing effective IT services/operations, i.e. they can: • Compare and reflect the different approaches • Analyze technological trends such as cloud computing or enterprise social media • Create ways to structure the IT function and to source IT services *Competencies:* On successful completion of this module, students can take responsibility for group projects in the "IT world" and serve as valuable experts at the interface between a firm's IT function and business units and communicate with IT experts in a business setting, i.e. they can: • Evaluate and communicate the value of IT in terms of potential benefits • Manage successful IT exploitation within organizations • Contribute to a firm's strategic utilization of IT and information systems
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-
Literaturhinweise	Will be announced during the course
Modulstruktur	
Verwendbarkeit für andere Module und Programme	Modules in the Digital Business concentration, Master's Thesis
Letztes Freigabedatum	26.01.2018

Innovation Management [MGT71410]

Modulkoordinator		Schlapp, Jochen			
Studiengang		MSc MiM			
Studienabschnitt		Semester 3			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		None			
Kurzbeschreibung / Lerninhalte		In most industries, good R&D performance is critical to generate and sustain a lasting market success, and at the heart of every R&D process is a firm's innovation management. Starting with the generation of possible innovation opportunities, and continuing with the selection of the most promising ideas and the transformation of these ideas into final products, innovation management has to deal with a set of utterly diverse challenges. For instance, should innovation be incremental or radical; or what are the benefits and costs of open innovation? This course sets out to discuss the key challenges that are inherent to innovation and product development processes. To this end, the course also introduces students to business model innovations and the impact of new technologies on existing R&D strategies.			

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On successful completion of this module, students will have a thorough comprehension of principal concepts and theories in innovation and R&D management; i.e., they can:
- explain the main concepts and theories of innovation management,
- identify the key challenges in different stages of the innovation process,
- understand the impact of R&D decisions on firm performance.

Skills:
On successful completion of this module, students will have the proven ability to apply advanced knowledge in innovation management and to solve complex managerial problems; i.e., they can:
- apply theories and concepts to analyse and optimise real-world problems,
- evaluate the interactions between different strategic decisions and create strategic alignment,
- design organisational structures that promote innovation,
- evaluate the benefits and shortcomings of different innovation processes.

Competencies:
On successful completion of this module, students can:
- develop a coherent innovation strategy,
- structure innovation processes,
- evaluate the impact of innovation on firm performance.

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<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures, classroom discussions, classroom experiments, case presentations</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Final written exam</td><td>60 min</td><td>60</td><td>End of the module</td></tr>
<tr><td>Presentation (group)</td><td></td><td>35</td><td>During the module</td></tr>
<tr><td>Quizzes</td><td></td><td>15</td><td>During the module</td></tr>
<tr><td>Class participation</td><td></td><td>10</td><td>During the module</td></tr>
</table>

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Literaturhinweise	• Christensen. 2000. The Innovator's Dilemma. Harvard Business Review Press. • Girotra, Netessine. 2014. The Risk-Driven Business Model. Harvard Business Review Press. • Loch, Kavadias. 2008. Handbook of New Product Development Management. Butterworth-Heinemann. • Ries. 2017. The Lean Startup. Currency. • Schilling. 2015. Strategic Management of Technological Innovation. McGraw-Hill.
Modulstruktur	Lectures will be scheduled over the course of the semester. A high degree of active student involvement is expected. The conceptual and theoretical discussion will be supplemented by case studies, classroom experiments, and group work in class.
Verwendbarkeit für andere Module und Programme	Concentrations: Strategy, Technology & Operations, Digital Business; Thesis
Letztes Freigabedatum	08.08.2017

Strategic Management [MGT71560]

Modulkoordinator		Fitza, Markus			
Studiengang		MSc MiM			
Studienabschnitt		Semester 2 Q3			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Business Economics			
Kurzbeschreibung / Lerninhalte		Strategy is about why some firms are successful and others are not. The course develops an understanding of how firms can design processes in markets and organisations to achieve competitive advantages. The first part of the course offers a comprehensive overview of how market processes affect firm profitability. The second part discusses how organisational processes contribute to competitive advantages.			

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<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On successful completion of this module, students will have a thorough comprehension of principal concepts and theories in strategic management, i.e. they can:
- Explain the main concepts and theories of strategic management,
- Outline how industry- and firm-level factors contribute to financial performance.

Skills:
On successful completion of this module, students will have the proven ability to apply advanced knowledge in Strategic Management and to solve complex managerial problems, i.e. they can:
- Apply theories and concepts to analyse real-worlds problems in firms and industries,
- Analyse how firm-level factor contribute to performance
- Identify how market processes affect firm profitability,
- Evaluate the advantages and disadvantages of alternatives corporate and business strategies.

Competencies:
On successful completion of this module, students can:
- Structure the strategic analysis of firms and markets,
- Present and argue for a strategic analysis,
- Develop strategic recommendations,
- Argue the advantages and disadvantages of strategic recommendations.

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<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures, classroom discussion, classroom experiments, case presentations</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Group presentation</td><td>20 min each</td><td>60</td><td>During the term</td></tr>
<tr><td>Class participation</td><td></td><td>20</td><td>During the module</td></tr>
<tr><td>Exercises and quizzes</td><td></td><td>40</td><td>During the module</td></tr>
</table>

</td></tr>
<tr><td>Literaturhinweise</td><td>I recommend the following books: “Strategic Management”, by Dess, Lumpkin and Eisner and Besanko et al., Economics of Strategy, 7th edition, Wiley 2017. But this is not a requirement, you can use the books as a reference source.</td></tr>
<tr><td>Modulstruktur</td><td>Lectures will be scheduled over the course of the semester. A high degree of active student involvement is expected. The conceptual and theoretical discussion will be supplemented by case studies, classroom experiments, and group work in class.</td></tr>
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Verwendbarkeit für andere Module und Programme	Concentration Strategy & Organisation; Master's Thesis
Letztes Freigabedatum	17.12.2019

Operations Management [MGT71320]

Modulkoordinator		Kremer, Mirko			
Studiengang		MSc MiM			
Studienabschnitt		Semester 2			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Basic Statistics (in particular, probability distributions), elementary calculus and algebra, basic spreadsheet engineering skills (i.e., working knowledge of Microsoft Excel).			
Kurzbeschreibung / Lerninhalte					

Qualifikationsziele / Lernergebnisse	This course introduces principles, technologies, and tools designed to increase organizational performance by better matching supply with demand in an uncertain world. A key objective is the acquisition of a set of key methods you can use as a manager to control and improve operations. Besides illustrating the underlying principles of these tools, we will challenge your managerial skills and ask you to apply them in realistic settings. *Knowledge:* On successful completion of the module, the participants will have knowledge of a wide range of operations management tools, i.e. they • understand the fundamental concepts of any business process: throughput, throughput time, work in process and the relationship between the three. • can explain and operate the toolset introduced in this module • can evaluate the tools and discuss their strengths and weaknesses *Skills:* On successful completion of the module, students will have the proven ability to apply advanced knowledge in Operations Management and to solve practice-oriented challenges, i.e. they can • analyze, structure and classify operations management challenges in practice and theory • identify the problem adequate quantitative model or qualitative strategy • apply the adequate quantitative model or qualitative strategy to solve an operations management challenge • use spreadsheets to support quantitative modeling *Competencies:* Successful module participants develop the requisite know-how to provide responsible contributions in establishing concepts and processes in operations management. They acquire the ability to further develop and adapt to the needs in practice. They can • articulate the operational rationale behind a successful business process • present operations management challenges to a broad audience • argue competently about problem solution strategies

Lernformen, Methodik und Betreuung	The course is a combination of case study discussions, lectures, tutorials, technical exercises, and games. The course is based on the text book shown under recommended literature. Essentially, the class instructional format will be a dialogue between the students and the instructor. It is important to note that strong class participation is founded on adequate preparation. Students are expected to thoroughly review the material on every case or reading prior to its discussion in class. It is expected that students do a thorough analysis of the case based on specific questions that will be provided, and prepare a plan of action appropriate to the circumstances. When students are prepared, the class discussion is greatly enhanced and everyone learns far more than otherwise.
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-
Literaturhinweise	The following textbook provides most of the methodological backbone of this class: *Cachon and Terwiesch. Matching Supply With Demand - An Introduction to Operations Management. 3rd edition. McGraw Hill.* The textbook can be found in the FS library in reasonable numbers. All other course materials (slides, quizzes, assignments, tutorials, case studies) will be distributed electronically on the Learning Management System.
Modulstruktur	Sessions 1-4 deal with the fundamentals of design and management of business processes. Building on the fundamentals, Sessions 5–10 deal with the processes involved in matching supply with demand in uncertain, highly variable environments. Managing variability is a key underlying theme across the course. Session 11 is devoted to group presentations of medium-scale projects that require students to apply Operations Management principles, thinking, and tools to a real business process that they themselves interact with. With a more detailed break-down to follow at the beginning of class, it is built around this basic structure: 1. Introduction 2. Process Analysis 3. Process Improvement 4. Process Interruptions 5. Managing Quality 6. Managing Service Processes I 7. Managing Service Processes II 8. Managing Inventory I 9. Managing Inventory II 10. Operations-Driven Business Model Innovation 11. Operations in the wild: Group presentations

Verwendbarkeit für andere Module und Programme	All concentrations. Some electives.
Letztes Freigabedatum	30.01.2018

Leadership and Organisational Behaviour
[MGT74910]

Modulkoordinator		Rerup, Claus			
Studiengang		MSc MiM			
Studienabschnitt		Semester 2 Q4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Basic knowledge of organizational behavior/theory, scientific training beyond the bachelor level in some discipline.			
Kurzbeschreibung / Lerninhalte		Business organisations of all types face chronic management and leadership problems that pose significant challenges to them. These problems include the difficulty of designing organisations capable of coping with highly dynamic business environments, the challenge of developing strategies and structures for hypercompetitive conditions, the greater complexity of managing global enterprises, the difficult task of shaping a corporate culture, managing politics and conflict between individuals and organisational units, motivating employees who are more mobile than ever, leading managerial teams effectively, and so on. These and other challenges, and how leaders of organisations can deal with them, are the subject of this course.			

Qualifikationsziele / Lernergebnisse	The course will introduce you to tools and frameworks that will help you understand and manage the challenges posed by leadership in modern organisations. These frameworks will provide you with a better basis for evaluating organisations and the people within them. In addition to providing you with a framework for understanding leadership challenges, a second objective of this course is to teach you skills in applying those theories and frameworks to leadership situations with appropriate solutions. Leadership skills are most effectively developed through practice. Therefore, it is essential that you have considerable opportunity to work on actual leadership problems. In order to do this we will rely heavily on case analyses. Cases and various exercises will provide the material to practice analysing and addressing leadership challenges. You are expected to carefully analyse all of the cases, prepare your thoughts on them, and participate in the analyses in class. It is my hope that by the end of the term, you will be able to see organisational and leadership problems in ways you could not see them before. More importantly, you will leave the course more conscious of the consequences related to the choices you make as a leader in an organisation. *Knowledge:* On successful completion of this module, students will have a thorough comprehension of principal concepts and theories in leadership and organisational behavior, i.e. they can • explain the main concepts in leadership and organisational behaviour • illustrate key constructs by means of case studies and real-time stories in the news • outline the relevance and irrelevance of leader • apply course material to their own context, and draw implications for how to act *Skills:* On successful completion of this module, students will have the proven ability to apply advanced knowledge in leadership and organisational behaviour and to solve complex managerial problems, i.e. they can • apply theories and concepts to analyse real-worlds problems • evaluate leadership and organisational behaviour problems from different perspectives (logics) • draw relational maps and apply them to leadership and organisational behaviour problems *Competencies:* On successful completion of this module, students can • structure the analysis of leadership and organisational behaviour problems across the individual, team and organisational levels of analysis • develop leadership and organisational behaviour recommendations • argue for the pros and cons of specific recommendations
Lernformen, Methodik und Betreuung	Lectures, classroom discussion, classroom experiments, case presentations, team work

ESG Investing: People. Power. Profit
[MGT70481]

Modulkoordinator		Newton, Andrew William			
Studiengang		MoF, MiM			
Studienabschnitt		Semester 4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	37 Academic Hours	Selbststudium:	122 h
Voraussetzungen für die Teilnahme		Principles or Foundations of Finance. Basic ethics. Bachelors Degree in business			

Kurzbeschreibung / Lerninhalte	This course is designed to complement your quantitative skills in financial analysis and portfolio management with the conceptual and analytical insights needed to compete for jobs in what the Financial Times has called the ESG 'war for talent' – the current high demand for those with the knowledge and skills necessary to integrate environmental, social, and governance (ESG) factors into investment decision-making. Coverage includes: • Three motives for ESG investing: people, power, and profit • Stakeholder analysis for investors • Understanding transmission mechanisms from values to value • The central role of reputation and company culture in linking values to value • The 'E' and the 'S': seeing business through the lenses of human rights, justice and sustainability. • The 'G': corporate governance paradigms, risks and opportunities • ESG data challenges, and reporting standards related to ESG analysis • Stewardship strategies: engagement, coalition-building, voting, resolutions, and exit • Fixed income ESG and the green bond phenomenon • Climate change as a cross-cutting issue Some work each day is conducted in teams of your own choice. Among other tasks, you will get time to work on your deliverable for the group presentation assessment in the final session. I will be available to spend time with each team during these periods to talk through issues you have encountered in your presentation.

Qualifikationsziele / Lernergebnisse	Knowledge: Upon successful completion of this module, students will know and understand the rationales for, core concepts of, and approaches to the integration of environmental, social, and governance factors into investment decision-making e.g. they will be able to: • Identify and explain the three main drivers (people, power, profit) for integrating ESG insights into investment (and therefore corporate) decision-making; • Explain the ethical and political norms against which ESG performance is benchmarked, including human rights, justice, and sustainability; • Identify a firm's stakeholders, and explain the significance of the different bases on which stakeholders are connected to an enterprise for value creation and risk; • Identify and explain a selection of key current ESG performance issues, including climate change and diversity; • Explain the various transmission mechanisms by which values performance affects firm value and risk both for equity and fixed income investors, including the mediating role of reputational resources such as trust and legitimacy; • Locate relevant, comparable, and robust data on firm ESG performance; • Identify the range of stewardship strategies open to investors wishing to influence portfolio companies on their ESG performance, and explain the success factors required for each. Skills: Upon successful completion of this module, students will be able to (complete the following tasks/solve the following problems): • Analyse a firm's stakeholders, and the different capacities in which each is connected to the enterprise; • Identify performance benchmarks for existing ESG concerns such as climate change, diversity, and global inequality in terms of specific ethical, political, and industry norms, and identify emerging ESG concerns in the same terms; • Research data on a firm's ESG performance and analyse that performance against norms and peers; • Analyse the available tactical choices available for the stewardship of an investment and identify those most likely to succeed. Competence: Upon successful completion of this module, students will have learned about how to integrate environmental, social and governance concerns into investment strategy, selection, and stewardship. Specifically, they will be ready to: • Undertake robust research and analysis of a firm's ESG performance; • Craft compelling arguments applying ESG performance insights for input to portfolio strategy formulation and investment selection processes;

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- Devise and execute realistic strategies for the ongoing stewardship of portfolio assets in line with client ESG objectives.

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<tr><td>Lernformen, Methodik und Betreuung</td><td>Pre-course readings, interactive lectures, group work, case studies, classroom exercises, student presentations.</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><th>Type of examination</th><th>Duration or length</th><th>Performance Points</th><th>Due date or date of exam</th></tr>
<tr><td>Individual quiz</td><td>20 minutes</td><td>20</td><td>End of Friday afternoon</td></tr>
<tr><td>Group presentations</td><td>20 minutes per group</td><td>70</td><td>Last session Saturday morning</td></tr>
<tr><td>Individual Multiple-Choice exam</td><td>30 minutes</td><td>30</td><td>Exam week</td></tr>
</table>

- The assessments have the potential for a maximum 120 points in total. Full instructions and grading rubrics are set out in the Assessments Pack.
- The Group Presentation assessment requires self-selected groups of students to evaluate a given company stock and/or bond from an ESG perspective, including articulation of a stewardship strategy. The 20-minute presentation takes place on the last afternoon of class. (70 points)
- The Individual Multiple-Choice Exam is an individual test taken during exam week. The test contains 30 questions and lasts 30 minutes. (30 points)
- The Canvas-based Individual Exercise requires students to complete a set of questions related to an analysis of the ESG performance of a particular company. This exercise lasts 20 minutes and will be scheduled during the Friday afternoon. (20 points)

Students should review the Assessments Pack for detailed instructions and grading rubrics.

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<tr><td>Literaturhinweise</td><td>

- Schoenmaker, D., and Schramade, W. Principles of Sustainable Finance. Oxford: Oxford University Press. 2019.

</td></tr>
<tr><td>Modulstruktur</td><td>Lectures take place in one concentrated block-week</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>N/A</td></tr>
<tr><td>Letztes Freigabedatum</td><td>18.09.2020</td></tr>
</table>

Mergers & Acquisitions [FIN72090]

Modulkoordinator	Hirst, Simon				
Studiengang	MoF; MiM				
Studienabschnitt	Semester 4				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Wahl				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Principles or Foundations of Finance. Bachelor Degree in Business. Basic level of Accounting. Basic Level of Excel modelling skills				

Kurzbeschreibung / Lerninhalte	• Origins of Merger & Acquisition activity and rationale thereof
	• Technical explanation of mergers versus acquisitions and partial mergers, and reverse mergers
	• Benefits & risks of M&A transactions - Revenue & Cost Synergies
	• Detailed Merger & Acquisition Case Studies, including a selection of:
	  • *Merger of AOL and Time Warner*
	  • *Potential Merger of Kraft Heinz & Unilever*
	  • *Merger of BAT and RJ Reynolds*
	  • *Countrywide – Distressed Restructuring*
	• Valuation in the Context of Mergers & Acquisitions
	• Concept of How an M&A Transaction Works from a Numerical Perspective
	• *Key Accounting Concepts Relating to M&A Analysis*
	• Financing Acquisitions & the benefits/risks of Leverage
	• *Summary Pro Forma M&A Analysis using Excel spreadsheets*
	• *Explanation of a fully dynamic "three dimensional" analytical M&A and Forecasting Model using Excel*
	
	The class will build a 3-dimensional LBO Model in Excel in class
	
	During some full or partial afternoon sessions, the class will be divided into teams of their own choice and work on a detailed Case Study relating to a potential merger of two large real European consumer products companies, both household names. The professor will mentor each team, one-by-one in turn during these group working sessions. Each Group will present their cases in the final session, as shown below.				

Qualifikationsziele / Lernergebnisse	*Knowledge:* Upon successful completion of this module, students will gain knowledge about the process of M&A transactions, i.e. they can: • Explain the rationale for M&A transactions and how deals work from a broad numerical and strategic perspective • Judge what makes deals successful and what makes them fail *Skills:* Students will be taught using exactly the same methodology as they would learn working full time at a major investment bank or private equity firm. Upon successful completion of this module, students will be able to: • Analyse M&A transactions in detail, with different structures and deal parameters • Formulate an approach which is entirely consistent with strategic and financial priorities. This is relevant for those who want to pursue a career in corporate finance within a large company, management consulting, investment banking and private equity • Understand the basic elements of "three dimensional" analysis in Excel (made simple) which is highly relevant to both an entrepreneurial and corporate career, as well as finance/investment banking/private equity • Understand how to build an LBO Model with three dimensional architecture *Competence:* Upon successful completion of this module, students will have learned about all aspects of M&A, i.e. they can: • Analyse transactions in manner that is consistent with both a classic theoretical approach and real business practices on Wall Street
Lernformen, Methodik und Betreuung	Conceptual lectures, case study lectures, class excel work, and professor/students study groups

<table>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

Type of examination	Duration or length	Performance Points	Due date or date of exam
Group case study	20 minutes per group	70	Last afternoon
Individual Multiple Choice exam	30 minutes	30	Exam week
Individual Excel quiz	20 minutes	20	End of last morning

Students need to bring a laptop to each class with Microsoft Office software installed
The assessments have the potential for a maximum 120 points in total
The Group Case Study will involve groups of students evaluating a specific M&A situation and presenting it on the last afternoon of class in a 20-minute slide presentation summarizing issues relating to the transaction, in accordance with a list of questions distributed on the first day of Class. 70 points are available for this case study.
The Individual Multiple Choice Exam is an individual test taken during exam week. There will be 30 questions to be answered in 30 minutes. Each question has 4 possible answers, only 1 of which is correct. Each correct answer gets 1 point, with no deductions for wrong answers, giving 30 available points for this exam.
The Individual Excel Quiz will involve students completing a specific schedule in Excel, based upon tables taught in class. This test lasts 20 minutes and will be scheduled just before lunch on the last day of classes. There are 20 available points for this exam.
Students should review the attached procedures and grading criteria for each assignment

</td></tr>
<tr><td>Literaturhinweise</td><td>

Hirst, Simon: 3-D Concept Course Notes (2017)
Hirst, Simon: Model Structure Course Notes (2017)

These notes are extensive and so take the place of all other course related materials. Both documents will be distributed to all participants in advance of the course.
</td></tr>
<tr><td>Modulstruktur</td><td>Lectures take place in two concentrated block-weeks</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>This elective is one of the potential prerequisites for the Advanced Merger & Acquisitions</td></tr>
<tr><td>Letztes Freigabedatum</td><td>23.05.2019</td></tr>
</table>

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Quantitative Trading and Analysis with Python [FIN70970]

Modulkoordinator		Vilkov, Grigory			
Studiengang		MiM, MoF			
Studienabschnitt		Semester 4			
Moduldauer		-			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Recommended: successful completion of the modules Quantitative Portfolio Management or Portfolio Risk Management, or possession of comparable understanding and skills in the area of portfolio allocation methods, factor models, optimization techniques, statistics and econometrics.			
Kurzbeschreibung / Lerninhalte		1. Principles and practice of data manipulation in Python (import, storage, preparation for quantitative trading systems), using Pandas and selected APIs for data access 2. Principles and development of trading systems, with emphasis on low frequency (not low-latency algo trading systems) quantitative trading 3. Python/ Quantopian as language/ platform of choice for quantitative trading 4. Examples of trading systems/ path to developing a trading system/ course project to develop a particular trading system in Quantopian environment			
Qualifikationsziele / Lernergebnisse		By the end of the course the students will be able to develop a quantitative trading system, including 1. Identification of an idea for trading using academic literature 2. Formulation of an algorithms 3. Identification of data needs, creating, cleaning, and preparing data for the system 4. Programming a system prototype (using Python and/ or Quantopian environment) 5. Backtesting and anslysis of the quantitative trading system			

<table>
<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures with theoretical and practical examples
Programming assignments in class and at home
Group project involving devlopment of a quantitative trading strategy, its implementation, and description of results (with a short presentation in the class if time permits)</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date/ Date of Exam</td></tr>
<tr><td>Home assignments (individual)</td><td>during the module</td><td>40</td><td>weekly</td></tr>
<tr><td>Course project (group)</td><td>during the module</td><td>30</td><td>Last week of the module</td></tr>
<tr><td>Written exam</td><td>50+10 min</td><td>50</td><td>Exam week</td></tr>
</table>
</td></tr>
<tr><td>Literaturhinweise</td><td>Technical documentation for Python and selected packages (numpy, pandas, scipy and some others)
Quantopian (manuals and guides)
Additional materials will be specified before the start of the course</td></tr>
<tr><td>Modulstruktur</td><td>TBD by January 2020</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>The course provides a natural path to the master thesis work</td></tr>
<tr><td>Letztes Freigabedatum</td><td>15.08.2019</td></tr>
</table>

Practical Data Science and Artificial Intelligence in Python [MGT63436]

Modulkoordinator		Strube, Moritz			
Studiengang		MADS, MoF & MiM			
Studienabschnitt		4. Semester			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	37 Academic Hours	Selbststudium:	122 h
Voraussetzungen für die Teilnahme		? Linear Algebra, probability theory, statistics? Statistical foundation of machine learning? General understanding of computer algorithms and data structures ? Basic Python skills? Laptop with internet access, Google Chrome installed and a Google account			
Kurzbeschreibung / Lerninhalte		In this course, students will apply the theoretical knowledge of Data Science and Artificial Intelligence acquired in other courses in practice by implementing programs in the computer language Python. In coding sessions with state-of-the-art tools, the most important topics in Data Science and Artificial Intelligence are covered. These include data sources, data import, data wrangling, data analysis, visualization, statistical modelling and model deployment. The course covers also topics like Cloud Computing, Mobile Computing, Edge-Computing and IoT in relation to Data Science and Artificial Intelligence.			
Qualifikationsziele / Lernergebnisse		At the end of the learning process the student is able to: • list some of the most important state-of-the-art-tools for Data Science and Artificial Intelligence • use these tools to analyze data and for implementing statistical models • interpret the results from statistical models • describe and explain the underlying methods • judge the suitability of approaches and methods • propose approaches for statistical analysis and statistical models • assess outcomes of data science and artificial intelligence projects • organize data science and artificial intelligence projects			

<table>
<tr><td>Lernformen, Methodik und Betreuung</td><td>Course with lectures and practical exercises. Hands-on sessions include programming tasks in Python. Students use their own laptop with Chrome installed and with their own Google account.</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date oder Date of Exam</td></tr>
<tr><td>In-class assignments</td><td>8h</td><td>120</td><td>During classes</td></tr>
</table>
</td></tr>
<tr><td>Literaturhinweise</td><td>• VanderPlas: Python Data Science Handbook[1]
• Hastie, Tibshirani, Friedman: The Elements of Statistical Learning (Introduction, Chapter 1)[2]</td></tr>
<tr><td>Modulstruktur</td><td>1. Introduction and recapitulation of Data Science and Artificial Intelligence topics
2. Introduction to state-of-the-art tools like Python, Jupyter, Numpy, Pandas and Tensorflow
3. Data Science and Artificial Intelligence coding sessions with online Jupyter notebooks
4. Implementing Data Science and Artificial Intelligence with Cloud Computing, Mobile Computing, Edge-Computing
5. Applying Data Science and Artificial Intelligence to IoT</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>Master?s thesis</td></tr>
<tr><td>Letztes Freigabedatum</td><td>15.09.2020</td></tr>
</table>

Entrepreneurship and Business Model Innovation in the 3D Printing Era [MGT70921]

Module Coordinator		Fitza, Markus; Kremer, Mirko			
Programme(s)		MoF, MiM			
Term		Semester 4			
Module Duration		1 Semester			
Compulsory/Elective Module		Elective Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	37 Academic Hours	Independent Learning:	122 h
Prerequisites		A curious mind. Full of ideas. Some interest in technology.			

Content	The objective of this course is two-fold. The first objective is to introduce students to the disruptive potential of 3D Printing technology, which has begun to change the nature of products, the role of consumers, and the business models of entire industries. Unfortunately, few (aspiring) managers have been directly exposed to this revolutionary technology. As a result, few managers have acquired a solid understanding of the technology's impact on innovative business models, and the entrepreneurial processes through which innovative business models emerge. Against this backdrop, as its second objective, the course provides an environment in which students can experience many of the aspects of being an entrepreneur. It aims to provide students with an understanding of the entrepreneurial process and the various concepts, practices, and tools used in the entrepreneurial arena. The course has a strong focus on gaining experiences in entrepreneurial practice. We hope you will develop an entrepreneurial mindset, which should serve you well in whatever career you chose. One of the main reasons why entrepreneurs fail, is because they did not test their ideas early or quickly enough; they did not force themselves to expose their ideas to reality. This course is about learning how to avoid this trap, and developing an understanding of the conditions under which 3D printing can help with it. What the class is not about: This course is about learning the practice of being an entrepreneur. It is not about planning, it is about acting: It will not teach you how to write a business plan, it is not about how to get venture capital funding or how to analyse start-ups. The course cannot be successfully completed by only doing research in the library.

Intended Learning Outcomes	**Knowledge:** On successful completion of this module, students will have a thorough comprehension that entrepreneurship requires being active; they will have an understanding of the practice of entrepreneurship. They will also have gained an in-depth understanding of how, and under what conditions, additive manufacturing technology (i.e., 3D print) can unleash entrepreneurial activities. Students can: • Understand fundamental characteristics of 3D printing technology, vis-à-vis traditional manufacturing technologies. • Understand the economics of 3D printing in various settings. • Understand the implications of 3D printing on the design of Operating Systems. • Understand the implications of 3D printing on entrepreneurial activities. **Skills:** On successful completion of this module, students will have practiced many of the necessary skills needed to start entrepreneurial projects and companies. Specifically, they will have practiced how additive manufacturing technology (3D printing) can foster entrepreneurial activities. Students will develop various skill around: • Refining ideas • Testing assumptions that underlie an idea • Rapidly converting ideas into high quality prototypes (minimum viable products) • Talking to potential customers, getting feedback about entrepreneurial ideas • Creating experiments to test aspects of a business model • Drawing conclusions from experimental data • Testing ideas in the real world • Prioritizing and synthesizing work. • Communicating the potential of 3D printing. **Competencies:** On successful completion of this module, students can apply the skills described above.

Forms of teaching, methods and support	The main task of the class is to develop and test a business idea, leveraging the revolutionary potential of 3D printing technology. You will gain key skills that are relevant for entrepreneurs but which can also be applied to the wider business context. A primary focus of this class will be gaining experience in the practices needed to develop a venture business model. This will require some field work such as conducting experiments to test aspects of the model, talking to potential customers to better understand their needs and talking to potential partners to set up your business. The class instructional format, for the most part, will be an (team-) activity-based dialogue between the students and the instructors. It is important to note that strong class participation is founded on adequate preparation. When there are pre-class readings, we expect students to thoroughly read them. When students are prepared, the class discussion is greatly enhanced and everyone learns far more than otherwise.

<table>
<tr><td>Type of Assessment(s) and performance</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date</td></tr>
<tr><td>Class participation</td><td>Throughout the module</td><td>20</td><td>During the module</td></tr>
<tr><td>Quizzes and exercises</td><td>TBA</td><td>40</td><td>During the module</td></tr>
<tr><td>Group project</td><td>TBA</td><td>60</td><td>Presentation: Session 11; Report: tbd</td></tr>
</table>

Class participation.
You can earn credit towards your class participation both inside and outside of the classroom. In order to contribute to in-class discussion, of course, you must show up. Please arrange your other activities to permit you to attend class; drop us a note if you cannot come. Mostly, our discussions will be free form: anyone who has something to contribute can and should. Students will be evaluated on the quality of the contributions (not the quantity).

Quizzes and Exercises
We will administer a small number of short quizzes to test your understanding of some concepts taught in class, as well as some background readings.

Group Project - Presentation & Report
You will begin with a problem for which your team will develop a product or service that is based on/utilises 3D printing as a solution. The task is to develop a viable business model for this solution. The main deliverables are a group presentation and a short “executive” write-up of the main conclusions and recommendations.
</td></tr>
<tr><td>Recommended Literature</td><td></td></tr>
<tr><td>Module Structure</td><td>The class will consist of roughly 35% lectures, 35% in-class exercises, 20% supervised learning and 10% site visits. A more detailed break-down to follow at the beginning of class.</td></tr>
<tr><td>Usability in other Modules/Programmes</td><td>Master's Thesis</td></tr>
<tr><td>Last Approval Date</td><td>2020/08/13</td></tr>
</table>

Insights into Manufacturing Industry
[MGT71461]

Module Coordinator		Thun, Jörn-Henrik			
Programme(s)		MoF; MiM; MADS			
Term		Semester 4			
Module Duration		1 Semester			
Compulsory/Elective Module		Elective Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	37 Academic Hours	Independent Learning:	122 h
Prerequisites		Operations Management			
Content		Covered industries are the following: Automotive Industry, Steel Industry, Machinery Industry, Electronics Industry, Pharmaceutical Industry, Chemical Industry, Aviation Industry, Food Industry, Apparel Industry, Defense Industry, Oil Industry & Energy Sector, Beverage Industry, Agricultural Industry, Furniture Industry, Tobacco Industry, Cosmetics Industry (subject to change) Hence, profound knowledge about the particularities of the respective industry is important for managers of all disciplines, not only for those with a specialization in manufacturing. However, this course is particularly interesting for students who are • interested in the manufacturing industry • want to learn about important business developments, or • want to get a deeper understanding of several industries			

<table>
<tr><td>Intended Learning Outcomes</td><td>

Knowledge:
The main purpose of this coiurse is to give insights into different industries . On successful completion of this module students can:
- illustrate the developments within the industry, describe typical products
- depict a typical supply chain of a company
- illustrate a typical production process for specific products
- identify global players and key suppliers
- understand relevant customer requirements
- reflect about ethical aspects
- illustrate the potential of Industry 4.0 for manufacturing companies

Skills:
Students will be able to analyse the business environment within the industry they are acting in.
On successful completion of this module students can:
- assess the specific situation a company has to deal with within the particular industry
- consider and evaluate diverse perspectives of a company and important decision domains in the specific business context

Competence:
After the successful completion of this module, students will acquire competence to
- prepare essential decisions in the respective business environment

</td></tr>
<tr><td>Forms of teaching, methods and support</td><td>Teaching in this module is primarily based on case studies to give students a practical, hands-on experience.

Students need to be prepared to be an active and well-prepared participant of the module and contribute regularly to in-class discussions!</td></tr>
<tr><td>Type of Assessment(s) and performance</td><td>

Type of Examination	Duration or Length	Performance Points	Due Date or Date of Exam
Group presentation	45 min	90	During the module
Discussion	15 min	15	During the module
Written group assignment	5 pages	15	End of the module

</td></tr>
<tr><td>Recommended Literature</td><td>Business Reports, newspaper articles, statistics, etc.</td></tr>
</table>

Module Structure	Lectures will be scheduled throughout the semester. In the module, students will prepare one presentation on a particular industry. Since a final exam at the end of the semester is not planned, individual performance and participation in group work concerning the presentation, the discussion and the written assignment will be essential for the final grade.
Usability in other Modules/Programmes	Other Electives; Master's Thesis
Last Approval Date	2020/09/14

Advanced Mergers & Aquisitions [FIN72290]

Modulkoordinator		Hirst, Simon			
Studiengang		MoF			
Studienabschnitt		Semester 4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Principles or Foundations of Finance / Bachelor Degree in Business; Intermediate level Excel Modelling skills; Familiarity with key concepts of Accounting; Either Participation in Case Studies in Investment Banking course or Mergers & Acquisitions Elective course			
Kurzbeschreibung / Lerninhalte		• Brief review of key numerical concepts of M & A and Valuation • Explanation of “Three Dimensional Analysis” and the creation of fully dynamic iterative and circular financial models in Excel, up to the advanced level used in the leading investment banks and private equity firms • Creation of a fully fledged Merger & Acquisition model in Excel with imbedded Three Dimensional Architecture for the Bidder, the Target and the Combined, using real companies as the Bidder and Target. This will be more advanced than the model used in the Mergers & Acquisitions Elective • Once the model has been explained and built, the class will form into groups of their own choosing to construct a certain part of the model themselves and input data for two entirely different companies • The Groups will work independently in some of the afternoon sessions and will be mentored by the Professor. The Class will discuss structural and financial issues to do with this example and the Groups will present their project in front of the Class for the Group Case Study Exam – this will require some deal structuring in Excel • To the extent time allows, there may also be a review of a Restructuring Model for a distressed company		

Qualifikationsziele / Lernergebnisse	*Knowledge:* Upon successful completion of this module, students will gain knowledge about the process of analyzing M&A transactions, i.e. they will: • Understand the key concepts and the mathematical relationships that drive the analysis of M&A transactions at an advanced level, combining knowledge of Business, Accounting & Finance • Understand the concept of three dimensional analysis as it relates to M&A and the construction of fully dynamic financial statements at an advanced level (for Bidder, Target and Combined) Understand how an advanced financial model is used within corporations, investment banks and private equity firms *Skills:* Upon successful completion of this module, students will be able to apply the knowledge they have gained above in the following manner: • Be able to construct three dimensional analysis with minimal supervision • Be able to complete a fully dynamic M&A model using Bidder and Target data from a blank template • Be capable of handling this analysis in relation to any industrial/consumer products company (i.e. not banks or financial institutions which have more complex regulatory parameters • Begin to be able to adapt models for any end-use with senior management *Competencies:* Upon successful completion of this module, students will have the confidence and knowledge to build very sophisticated financial models using the exact same methodology as that used by the major Wall Street investment banks and private equity houses. This should put students in an advantageous position if they want to pursue a career in investment banking, private equity, management consulting, corporate finance within a major company, or entrepreneurial activities – including the interview process.
Lernformen, Methodik und Betreuung	Lectures, in-class Excel analysis and model building performed by students (but with direct guidance from the professor), possible analytical case studies, students' presentations and mentoring of Groups by the Professor.

<table>
<tr>
<td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td>
<td>
<table>
<tr><th>Type of examination</th><th>Duration or length</th><th>Performance Points</th><th>Due date or date of exam</th></tr>
<tr><td>Group case analysis, presentation and paper</td><td>20 minutes per group</td><td>70</td><td>Last day of lecture</td></tr>
<tr><td>Individual Multiple Choice exam</td><td>30 minutes</td><td>30</td><td>Exam week</td></tr>
<tr><td>Individual Excel quiz</td><td>20 minutes</td><td>20</td><td>2nd last day</td></tr>
</table>

Details regarding the assessments will be given in first lecture
The assessments have the potential for a maximum 120 points in total
Students need to bring a laptop to every class with Excel software installed
The Group Case exam will involve groups of students evaluating a specific M&A situation and presented by them in class in a 20-minute slide presentation summarizing issues relating to the transaction, in accordance with a list of questions distributed in advance. In parallel, each group will submit their Excel model of the Case Study. This exam accounts for 70 points, with grading being based on the specific criteria which are attached.
The Individual Multiple Choice Exam is an individual test taken in Exam Week. There will be 30 questions to be answered in 30 minutes. Each question has 4 possible answers, only 1 of which is correct. Each correct answer gets 1 point, with no deductions for wrong answers. No Excel calculations will need to be made in the multiple choice, but there will be questions on specific issues relating to the use of Excel and its appropriate architecture in a financial model. A description of the structure used and the marking criteria for this exam is attached.
The Individual Excel Quiz will involve students creating a specific schedule in Excel, based upon concepts taught in class. This will take place on the second last day of classes.
A description of the structure used and the marking criteria for this exam is attached.

</td>
</tr>
<tr>
<td>Literaturhinweise</td>
<td>

Hirst, Simon: 3-D Concept Course Notes (2017)
Hirst, Simon: Model Structure Course Notes (2017)

These notes are extensive and so take the place of all other course related materials. Both documents will be distributed to all participants in advance of the course.
</td>
</tr>
<tr>
<td>Modulstruktur</td>
<td>Please see content.</td>
</tr>
</table>

Verwendbarkeit für andere Module und Programme	The elective Mergers & Acquisitions, being taught in two block weeks provides one of the possible prerequisites for this Advanced M&A elective course; Master's Thesis.
Letztes Freigabedatum	23.05.2019

Alternative Investments [FIN70620]

Modulkoordinator		Maier, Thomas; Vieira Severino, Leonardo			
Studiengang		MoF; MiM			
Studienabschnitt		Semester 4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Basic knowledge of asset classes, of financial theory (e.g. CAPM) and of asset valuation techniques (e.g. DCF valuation)			
Kurzbeschreibung / Lerninhalte		1. Alternative Investments • Types of alternative investments and their characteristics • Hedge Funds • Alternative Risk Premia • Manager selection and portfolio construction • Other types of Alternative Investments • Real World Examples 2. Hedge Funds 3. Real Estate as an asset class 4. Private Equity • Overview and history (raising funds, fund organization and structure, conflicts of interest compensation) • Investment Selection (deal origination, due diligence, valuation, syndication, deal terms) • Value creation & financing (monitoring, rounds and stages, leveraging, buy and build) • Seeking liquidity & exiting (recaps, sales, IPOs, secondary markets)			

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On successful completion of this module, students will have an in-depth understanding of financial theory, alternative investments and private equity, e.g. they can:
- Explain the different types of alternative investments, such as real estate, commodities and hedge funds
- Outline the details of the “Private Equity Cycle” from raising funds to exits

Skills:
On successful completion of this module, students will have the proven ability to apply the different types of alternative investments in modern portfolio management, e.g. they can:
- Judge the relative effectiveness of different strategies in the various parts of the Private Equity and Hedge Fund Cycle
- Evaluate the trade-off of costs, risks and return of different Hedge Fund and Private Equity strategies

Competence:
On successful completion of this module, students can take responsibility to successfully transfer the learned concepts to real world situations, e.g. they can:
- Critically assess alternative investment strategies and products
- Work in an asset management position based on the fundamental theoretical background learned
- Communicate the pros and cons of different private equity and hedge funds strategies

</td></tr>
<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures, class discussion, students’ presentations</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><th>Type of examination</th><th>Duration or length</th><th>Performance Points</th><th>Due date or date of exam</th></tr>
<tr><td>Group presentation and one-pager summary</td><td>Group presentation (approx. 30 minutes) followed by Q&A (approx. 15 minutes) and/or assigned tasks</td><td>120</td><td>During the module</td></tr>
</table>

Students will organize themselves into small groups and each group will then be assigned a topic by the lecturers. The group presentations will be integrated into class and each group will have to present on a predefined date. Each student has to present a part of the topic.

</td></tr>
<tr><td>Literaturhinweise</td><td>

- "Handbook of Alternative Assets", by Mark J. P. Anson, John Wiley & Sons (2006)
- Further literature will be given during the lecture.

</td></tr>
</table>

Modulstruktur	Individual and institutional investors tend to look beyond traditional investment vehicles such as bonds, shares and investment funds. This module provides a concise overview of the most important types of private equity and alternative investments and how they affect different portfolio parameters. The starting point is a differentiation between “classic” investments vs. alternative investments and an introduction to portfolio concepts in general. The main part of the course covers all types of private equity and alternative investments and their application in modern portfolio management.
Verwendbarkeit für andere Module und Programme	Subsequent Electives, Master's Thesis
Letztes Freigabedatum	17.07.2019

Applying Artificial Intelligence in Business
[MGT71650]

Module Coordinator	Szertics, Gergely				
Programme(s)	MoF, MiM, MADS				
Term	Semester 4				
Module Duration	1 Semester				
Compulsory/Elective Module	Elective Module				
Credits:	6				
Frequency	Annually				
Language	English				
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites	No technical skills are needed for the course.				
Content	The course is giving you an overview of how artificial intelligence (AI) as a technology affects business. Some are referring to AI as similarly transformative as electricity or the internet. The course is going to walk you through the different business areas and give you insights about what technologies can be used to improve business efficiency. The course is not giving any coding skills, it only reflects the technology through metaphors. We want you to become a bridge between business needs and technology solutions, not technology architects. We are going to cover the following questions: • What is Artificial Intelligence? • How does AI learn, and why does it need so much data? • How does the AI market build up (vendors, platform providers, development frameworks) • How does AI affect different business functions? • How does AI transform the specific processes, and what use-cases are there for each segment? • Why AI is disruptive and how it affects business models? • How to identify AI opportunities in a specific business process and how to build a business case around its implementation?				

Intended Learning Outcomes	*Knowledge:* On completion of this module, you will know about the basic concepts of how artificial intelligence works and can be applied. You will be able to: • understand the key notions regarding AI (machine learning, deep learning, supervised learning, unsupervised learning, reinforcement learning) • list typical applications of different modalities of AI (image processing, voice processing, natural language processing, numerical data processing) • describe the key effects of AI to specific business processes (sales, marketing, customer service, manufacturing, supply chain management) *Skills:* On successful completion of the course you will have the ability to create materials for business decisions based on horizontal market understanding. You will be able to: • showcase AI vendors for all above business areas and describe the AI behind the service • discuss the make or buy dilemma and distinguish between off the shelf AI products, AI platforms and AI development frameworks • explain how AI learns, what data it needs and why feedback loop is important for it *Competences:* With the acquired skills and knowledge, you will achieve abilities to evaluate AI against business problems and define which technologies could be the best to address them. In the following situations you will be able to: • evaluate a specific business processes and propose specific AI based technology implementations for efficiency improvements • discuss the disruptive potential of AI in key industries (retail, manufacturing, healthcare) • construct a map of AI opportunities for a specific organization and estimate business impact • elaborate and pitch business suggestions to a board about AI investments
Forms of teaching, methods and support	The basic teaching form will be lectures with a lot of integrated case studies.

Type of Assessment(s) and performance

Type of examination	Duration or length	Performance Points	Due date or date of exam
Class preparation / participation		30	Continuous
Exam for key concepts	30 minutes	30	The beginning of the 9th module
Pitch competition	3 hours	30	11th module
Elaboration of a map of opportunities for a use case	Homework	30	2 weeks after the end of course

Class preparation / participation
There are going to be group task for understanding use-cases, collecting ideas to use AI-based technologies to different functions and industries where you will be able to show how creatively and reasonably you can apply the principles of solving business problems with AI in specific cases.

Exam for key concepts
Understanding the most important concepts of AI is critical to being able to apply the technology in business. We are going to spend the first 4 modules on understanding these notions, show how they are implemented in different business scenarios in modules 5-8 and start the 9th module with a short exam.

Pitch competition
At the end of the course, teams are going to be given a corporate challenge: what AI tools could be used and how they could be beneficial in a specific corporate situation. Teams are going to have to elaborate key opportunities, rate them in complexity and business value and create a 5-minute presentation in highlighting the best potentials and AI related suggestions to the “board” of the company. The criteria used to judge performance include:

- Questions asked during the preparation phase from the board
- Understanding the complexity and addressing it with thorough solutions
- Business feasibility and technological validity of the ideas
- Quality of the final presentation

Creating a map of opportunities
After the end of the course, you will get a written corporate challenge to elaborate a written map of AI opportunities for the company. You will have to understand the related business processes, and look for relevant similar analogies of use-cases, or come up with internally executable development ideas. You will have two weeks to give a written proposal for a specific corporate situation with ranked opportunities.

Recommended Literature	• Ajay Agrawal, Joshua, Avi Goldfarb: Prediction machines: The Simple Economics of Artificial Intelligence, 2018 • McKinsey Global Institute, Artificial intelligence the next digital frontier?, 2017
Module Structure	The first 4 sessions are going to give an overview about how artificial intelligence works as a technology to be able to understand the foundations of machine learning in different data sources (numeric, visual, audio, language). In modules 5-8 we are going to focus on different business processes and how AI is transforming the way we automate and augment these areas. In sessions 9-10 we turn our attention to the risks and difficulties of choosing and implementing these technologies and we finish the course with a pitch competition. The more detailed breakdown of the structure is as follows: 1. Introduction to AI – history, and relationship to other technologies 2. What is “learning” – understanding machine learning through the analogies of human thinking 3. Patterns in numbers and voice 4. Natural language processing and image recognition 5. Applications in sales and marketing 6. Applications in customer service 7. Applications in manufacturing and supply chain management 8. Applications in supporting functions (HR, legal, finance) 9. The make or buy dilemma: estimating complexity and business value 10. The organizational competencies needed to integrate AI-based technologies 11. Pitch competition
Usability in other Modules/Programmes	Other electives, Master?s Thesis
Last Approval Date	2018/10/22

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Intercultural Management

<table>
<tr><td colspan="3">Module Coordinator</td><td colspan="2">Moshtagh Khorasani</td></tr>
<tr><td colspan="3">Programme(s)</td><td colspan="2">Master in Management</td></tr>
<tr><td colspan="3">Term</td><td colspan="2">Semester 3</td></tr>
<tr><td colspan="3">Module Duration</td><td colspan="2">One semester</td></tr>
<tr><td colspan="3">Compulsory/ Elective Module</td><td colspan="2">Concentration Module</td></tr>
<tr><td colspan="3">Credits</td><td colspan="2">6 ECTS</td></tr>
<tr><td colspan="3">Frequency</td><td colspan="2">Annually</td></tr>
<tr><td colspan="3">Language of Instruction</td><td colspan="2">English</td></tr>
<tr><td>Total Workload</td><td>150</td><td>Contact hours</td><td>44</td><td>Independent Learning 106</td></tr>
<tr><td colspan="3">Prerequisites</td><td colspan="2"></td></tr>
<tr><td colspan="3">Content</td><td colspan="2">1) Definition of culture and communication (cultural diversity)
2) Regulators of human life (religion, nation, class, gender, race, civilization)
3) Cultural dimensions (models of Hofstede, Trompenaars and Hampton-Turner, Hall)
4) Barriers to Intercultural Communication (anxiety, assuming similarity instead of difference, ethnocentrism, stereotypes and prejudice, nonverbal misinterpretations and language)
5) Comparative Cultural Patterns (USA, China, Middle East, Russia, etc.) Future challenges
6) Immigration and Acculturation (Europe)
7) Cultures Within Cultures: Identity and Subgroups
8) Contact Between Cultures Business Oriented</td></tr>
<tr><td colspan="3">Intended Learning Outcomes</td><td colspan="2"></td></tr>
<tr><td colspan="3">Forms of teaching, methods and support</td><td colspan="2">Lecture, case studies, group discussion</td></tr>
<tr><td colspan="3">Type of Assessment(s) and performance points</td><td colspan="2"><table><tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date</td></tr><tr><td>a) Written exam</td><td>3 hours</td><td>80 points</td><td></td></tr><tr><td>b) Group Presentation</td><td>20 mins</td><td>40 points</td><td></td></tr></table></td></tr>
<tr><td colspan="3">Recommended Literature</td><td colspan="2">- Barna, L. M. (1997). Stumbling blocks in intercultural communication. In Samovar, L. A., &Porter, R. E., (1997). Intercultural communication (eighth ed). Belmont, ca: Wadsworth Publishing.</td></tr>
</table>

	- **Chaney, L.; Martin, J.** (2014): Intercultural Business Communication. Boston. Pearson. - **Hall, E.** (1992). Understanding cultural differences. Yarmouth, Intercultural Press. - **Hall, E.** (1989). Beyond Culture. Anchor Books. - **Harris, P.; Moran, R.** (2004): Managing cultural differences leadership strategies for a new world of business. 5th edition. Woburn, MA, Butterworth-Heinemann. - **Hofstede, G. (1980):** Culture's Consequences: International Differences in Work-Related Values. Beverly Hills: Sage Publications. **Hofstede, G.** (1983): Dimensions of National Culture in Fifty Countries and Three Regions. In: Deregowski, J.B., Dziurawiec, S. and Annis, R.C. (Eds), Expiscations in Cross-Cultural Psychology, 335-355. Lisse: Swets & Zeitlinger. - Hofstede, G. (1986): Cultural Differences in Teaching and Learning. In: International Journal of Intercultural Relations, 10, 301-320. **- Hofstede, G.** (1991): Cultures and Organizations: Software ofthe Mind. London: McGraw Hill. **- Hofstede, G.** (1994): The Business of International Business is Culture. In: Interna tional Business Review, 3(1), 1-14. - **Hofstede, G.; Hofstede, G. J.; Minkov, M.** (2010): Cultures and organizations. Software of the mind ; intercultural cooperation and its importance for survival. Rev. and expanded 3. ed. New York: McGraw-Hill. - **House, R.J., Hanges, P.J., Javidan, M., Dorfman, P. W., & Gupta, V.** (2004). *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies*, copyright. - **Jandt, Fred E.** (2015). *An Introduction to Intercultural Communication Identities in a Global Community*, Eighth Edition, Sage Publications UK. **- Kopper, E.** (2003): Multicultural Teams. In Bergemann, N.; Sourisseaux, A. (Hrsg.): Interkulturelles Management. 3. Aufl. (S. 363–368). Berlin: Springer. **- Moll, M.** (2012): The Quintessence of Intercultural Business Communication. Berlin, Heidelberg: Springer. - **Silverthorne, C. P. (**2005): Organizational psychology in cross-cultural perspective. New York, N.Y: New York University Press. **- Trompenaars, F.** (1997): Riding the Waves of Culture. Understanding Cultural Diversity in Business. 2nd ed. London. Brealey. **- Trompenaars, F.** (2004): Managing people across cultures.

	Chichester. Capstone.
Module Structure	
Usability in other modules / programs	- Leadership studies - Organizational science - International business
Last Approval Date	*Approval Date by Programme Director and publishing date by programme assistant.*

Organisational Design [MGT73781]

Modulkoordinator		Billinger, Stephan			
Studiengang		MSc MiM			
Studienabschnitt		4 Semester			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahlpflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	37 Academic Hours	Selbststudium:	122 h
Voraussetzungen für die Teilnahme		Business Economics; Strategic Management			
Kurzbeschreibung / Lerninhalte		The module Organisational Design introduces key principles and methods used for designing effective organisations. It focuses in tradeoffs associated with the design and adaptation of cooperation and coordination in teams, departments, business units, and large corporations. The module builds on economic and behavioural perspectives and introduces classic as well as contemporary approaches to organisation design. The module combines case analyses, conceptual and problem-driven discussions, as well as teaching simulations, in order to offer a compelling introduction to managerial challenges in organisational design.			

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On successful completion of this module, students will have a thorough comprehension of principal concepts and theories in organisational design, i.e. they can:
- Describe the key trade-offs that occur when designing organisations
- Outline how organisation design influences differentiation and integration
- Explain how organisation design affects the motivation of organisational members

Skills:
On successful completion of this module, students will have the proven ability to apply principal knowledge in organisational design and to solve managerial problems, i.e. they can:
- Analyse how the organisational design aligns with the strategy and balances routine and innovation
- Derive organisational design criteria from a strategy
- Diagnose organisational shortcomings
- Develop and evaluate alternative organisational designs

Competencies:
On successful completion of this module, students can take responsibility to improve organisational performance, i.e. they can:
- Design interventions to improve organisational performance
- Design an effective organisation within its market niche and review its business performance for sustainability
- Capture and document the organisational design and performance assessment to support the agility for change of organisations
- Discuss trade-offs in organisational design

</td></tr>
<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures, classroom discussion, case studies, classroom experiments and teaching simulations.
Lectures will be scheduled in blocks. A high degree of student involvement is expected.</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Class participation</td><td>Throughout the module</td><td>30</td><td>During the module</td></tr>
<tr><td>Group project</td><td>TBA</td><td>40</td><td>During the module</td></tr>
<tr><td>Take-home exam</td><td>TBA</td><td>50</td><td>During the module</td></tr>
</table>

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</table>

Literaturhinweise	Gareth R. Jones, Organizational Theory, Design, and Change, 7th edition, Pearson 2013 Phanish Puranam, Bart Vanneste, Corporate Strategy: Tools for Analysis and Decision-Making, Cambridge University Press, 2016. James G. March, A Primer on Decision-Making: How Decisions Happen. The Free Press 1994 Robert Grant, Contemporary Strategy Analysis (combined text and cases), John Wiley & Sons, Inc., 9th edition, 2016
Modulstruktur	1. Organisation Design a. On the Nature of Organisation b. Organisation Design and Archetypes 2. Macro-level Organisation Design a. Corporate Strategy and Business Strategy b. The Corporate Headquarters and Value Chain Design 3. Micro-level Organisation Design a. Specialization and Coordination b. Authority, Delegation and Control 4. Organisation Design: Latest trends a. Teaching simulation b. New forms of organisation 5. Organisational Culture and Change a. Creating and Managing Organisational Culture b. Types and Forms of Organisational Change c. Competencies and Technology adoption d. Innovation and Ambidexterity 6. Case Presentations 7. Course Summary
Verwendbarkeit für andere Module und Programme	Master's Thesis
Letztes Freigabedatum	04.08.2020

Sustainability and Ethics in Digital Transformation [MGT63437]

Modulkoordinator		Mick, Thomas			
Studiengang		MiM; MoF; MADS			
Studienabschnitt		4. Semester			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	37 Academic Hours	Selbststudium:	122 h
Voraussetzungen für die Teilnahme		-			

Kurzbeschreibung / Lerninhalte	Welcome to the Future This module aims to provide a **holistic view** to the students to understand the global **digital ecosystem** in which we are operating nowadays and give them a perspective to **question current structures** as well as the tools to successfully understand and manage the role of companies as a driver for future innovation for our society in a sustainable and ethical way. Global Perspectives For the last 20 years our everyday life is becoming more and more influenced by technologies and products from the **digital realm** at an increasing rate of speed, creating a new renaissance in our world. Nowadays drivers are digital platforms concentrated in the US and China, forcing traditional companies to adapt quickly while major stakeholders from the corporate side like startups and their incubators and accelerators, fostered by investors, single nations and institutions like the European Commission, create value at an exponentially growing rate. Due to this increasing speed of development it is becoming more and more important to address upcoming **ethical questions** as well as facts about **sustainable development** framed by the Sustainable Development goals (SDGs) of the UN in 2015. Future Foundations Usually the implementation of digital technologies, that are implemented in companies as a driver for future development, aim to increase efficiency and effectiveness of the existing business landscape alone. It becomes more and more clear that this is **not enough** as these initiatives are not an enabler to close the gap between the existing business models and future demands. Instead, modern digital technologies have to be understood as **driver for future business value creation** taking into account all stakeholders involved. They must be our tools to evolve far beyond the current market as we understand it today. Local Implementation The idea of fostering the understanding of living in a knowledge society is becoming more and more obsolete. Knowledge becomes more and more accessible to people and gets outdated every faster. Driven by the understanding of creating business value by increasing

<table>
<tr><td></td><td>efficiency and effectiveness, nowadays jobs are becoming more and more narrow regarding the different types of tasks and challenges that need to be tackled by a single person in todays organizations.

To be able to navigate successfully towards the future and implement according business models, we need tools to see current situations from a holistic perspective to change ourselves to an innovation society as soon as possible.</td></tr>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>On successful completion of this module, students will have a thorough comprehension of the digital transformation, i.e. they
• know the major stakeholders of the global digital ecosystem and their interfaces
• understand the crucial role of ethics and sustainability in the process of digitalisation and can apply their principles to it
• understand and can apply technological concepts like Big Data, Artificial Intelligence, Machine Learning and Blockchain
• understand corporate structures as they exists nowadays and know different approaches for future developments
• know the concepts of System Thinking and can apply them to create holistic solutions
• understand the crucial role of Innovation and Change Management and how to apply them
• are able to develop digital solutions for future markets that are ethical and sustainable</td></tr>
<tr><td>Lernformen, Methodik und Betreuung</td><td></td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Intreactive assignments</td><td>One session</td><td>40</td><td>In-class</td></tr>
<tr><td>Digital Transformation Project</td><td>In-class</td><td>40</td><td>In-class</td></tr>
<tr><td>Final exam</td><td>50 min.</td><td>40</td><td>Exam week</td></tr>
</table>
</td></tr>
<tr><td>Literaturhinweise</td><td>Provided material during lecture.</td></tr>
</table>

Modulstruktur	Session Topic 1.1 Digitalization as the new industrial revolution 1.2 Individuals and Society 1.3 Ethics and Sustainability 1.4 Major stakeholders of the global ecosystem 2.1 Big Data 2.2 Artificial Intelligence 2.3 Machine learning 2.4 Blockchain 3.1 Corporate and Organizational structures 3.2 Innovation and Change Management 4.0 Digital Transformation Project
Verwendbarkeit für andere Module und Programme	-
Letztes Freigabedatum	31.08.2020

Responsible Management in Finance
[FIN72014]

Modulkoordinator	Andreicovici, Ionela				
Studiengang	MSc MF				
Studienabschnitt	Semester 2 Q3				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Macro & Monetary Economics, Foundations of Finance, Financial Products & Modelling; Financial Statement Analysis				
Kurzbeschreibung / Lerninhalte	Responsible management is all about reporting and using financial and non-financial information for business decision making in a responsible manner.				

Qualifikationsziele / Lernergebnisse	**Knowledge:** On successful completion of this module, students will have a thorough comprehension of the relevance of core concepts and approaches to responsible management in finance, e.g., they can: Become more aware of multiple stakeholder perspectives Understand that the impact of a company goes beyond its sphere Guide decision-making based on financial and non-financial data Illustrate corporate governance mechanisms **Skills:** On successful completion of this module, students will have the ability to apply advanced knowledge and related ethical concepts to an accounting and finance setting, e.g. they can: Critically assess ethical issues in accounting and finance and strategize solutions to solving them in practical terms Evaluate the ethical implications of strategic decisions Analyze the quality of a company's financial reports Identify reporting incentives and challenge assumptions about accounting quality Understand the fundamentals of insider trading Assess how a manager can ensure that ESG issues are considered in business decisions Identify corporate governance mechanisms Conduct independent empirical investigations **Competences:** On successful completion of this module, students can responsibly transfer these concepts and methods to typical management situations in the accounting and finance industry, e.g. they can: Make informed and ethically responsible business decisions
Lernformen, Methodik und Betreuung	The basic format of the classes in Frankfurt consists of lectures and case study discussions. Classes will generally start with an introduction to the main topic at hand, followed by case studies and empirical investigations. The course also comprises an offsite in Luxembourg in April 2020.
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	Participation Luxembourg Offsite: 5 performance points Class Participation: 15 performance points Group Assignment/Presentation: 40 performance points Written Exam: 60 performance points - 60 minutes + 10 minutes reading time

Literaturhinweise	**Course material:** We do not use a required textbook in this course. Pre-reading materials, slides, and other materials designed to offer support throughout the entire lecture are made available before the module starts.
Modulstruktur	**The following topics are covered in this course:** Shareholders vs. stakeholders Introduction to Stata Financial reporting quality/Earnings management Tax planning Insider trading Environmental Social and Governance Corporate governance structures
Verwendbarkeit für andere Module und Programme	Interdisciplinary knowledge of this module can be used within various other modules. Master's Thesis
Letztes Freigabedatum	23.01.2020

Financial Products & Modelling [FIN71570]

Modulkoordinator		Vilkov, Grigory			
Studiengang		MSc MF			
Studienabschnitt		-			
Moduldauer		-			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		None			
Kurzbeschreibung / Lerninhalte		Financial Markets • Trading, Instruments, Participants, and Mechanics • Regulatory Framework Financial Products • Discrete-Time Valuation Framework • Equity Derivatives • Valuation of Fixed Income Instruments • Interest Rate Derivatives • Credit Derivatives Introduction to Excel and VBA • General Intro • Using Excel for Pricing and Risk Management Bloomberg Market Concepts certification			

Qualifikationsziele / Lernergebnisse	*Knowledge:* On completion of this model, students will be able to express substantial knowledge on financial products and modelling, i.e., they can: • Describe the organization and functionality of financial markets and their regulatory framework • Identify the most relevant financial instruments for a specified purpose *Skills:* On successful completion of this model, students will have the proven ability to apply learned methods to the financial products and modelling framework, e.g., they can: • Analyze financial markets and evaluate financial instruments of different levels of complexity • Develop an appropriate solution for a given financial risk situation and know how to implement the solution using various financial instruments • Evaluate financial instruments with required standard and non-standard features *Competence:* On successful completion of this model, students will have acquired the competence to: • Evaluate and manage complex financial instruments to adequately solve financial risk management problems • Assume a responsible position in the area of financial risk management, investment banking, asset management or corporate finance
Lernformen, Methodik und Betreuung	Lectures, applied tutorials for Excel, online certification for Bloomberg (BMC)
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-

Literaturhinweise	*Extensively used in the course* • Sundaram, Rangarajan K. and Sanjiv Das, Derivatives: Principles and Practice, Mcgraw Hill Book 2010 • Mary Jackson, Mike Staunton, Advanced Modelling in Finance using Excel and VBA, John Wiley & Sons 2001 *Useful as additional reference* • Hull, John C : Options, Futures and other Derivatives,7th ed., Pearson, 2008 • Wilmott, Paul P.: Wilmott introduces Quantitative Finance. 2nd ed., John Wiley & Sons, 2007 • Teall, John L., Financial Trading and Investing, Academic Press 2012 • Bill Dalton, Financial Products: An Introduction Using Mathematics and Excel, Cambridge University Press 2008
Modulstruktur	24hrs Financial Products 12hrs Excel Training Online Bloomberg Market Concepts This module discusses the most important financial instruments. These include stocks, bonds and derivatives like swaps, futures, options, and credit derivatives. For all instruments we will clarify the intermediate and final cash flows, introduce basic valuation methods and discuss possible applications. The module also discusses variants and rules of securities trading as well as the organization and functionality of securities exchanges and over-the-counter markets.
Verwendbarkeit für andere Module und Programme	Subsequent modules
Letztes Freigabedatum	28.02.2018

Risk Management [FIN71030]

Modulkoordinator		Sannino, Francesco			
Studiengang		MSc MF			
Studienabschnitt		Semester 2			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Foundations of Finance, Statistics & Econometrics, Microsoft Excel			
Kurzbeschreibung / Lerninhalte		• Introduction (role of bank capital, overview of financial risk management) • Risk factors and risk mapping • Risk measures and Value-at-Risk • Market risk: Computing Value-at-Risk • Credit Risk and Credit Value-at-Risk • Economic capital and RAROC • Regulation and Basel II/II.2/III • Related topics and applications			

Qualifikationsziele / Lernergebnisse	*Knowledge:* On successful completion of this module, students will have a thorough comprehension of the basic definitions, theories and concepts of risk management, i.e. they can: • Explain how to manage and hedge trading book exposures • Summarize and discuss regulatory requirements • Validate how risk management supports to assure a bank's profitability *Skills:* On successful completion of this module, students will have the proven ability to apply risk measurement and risk management concepts for bank management purposes, i.e. they are able to: • Calculate various risk measures • Evaluate the impact of risk on prices for financial products and services • Apply risk measurement and risk management concepts for bank management purposes • Design instruments for a bank-wide risk management *Competence:* On successful completion of this module, students recognise the importance of risk management in a financial institution and are capable of acting as the interface between risk managers and other bank departments
Lernformen, Methodik und Betreuung	Lectures, in-class exercises, homework, case studies, presentations, written exam
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-
Literaturhinweise	• Hull, J.: Risk Management and Financial Institutions. Pearson Prentice Hall, 2007 Additional literature will be given in class

Modulstruktur	The module covers the foundations of risk management, with a special focus on market risk and credit risk. The importance of risk management for capital management and bank governance is stressed. Sev-eral techniques for computing standard risk measures (PVBP, Value-at-Risk) are taught and applied. Risk-adjusted profitability measures such as RAROC are considered. Techniques for allocating capital to individual business units are presented. Finally, the course covers regulatory aspects with a focus on Basel II and market risk. The aim of the module is: • To understand the importance of risk management in a bank/financial institution for regulatory purposes and for man-agement purposes • To understand how financial products are used for hedging • To understand how risk is measured on a bank-wide level
Verwendbarkeit für andere Module und Programme	Subsequent modules in all Concentrations
Letztes Freigabedatum	26.01.2018

Data Analytics and Machine Learning in Finance [FIN72017]

Modulkoordinator	Wheeler, Gregory				
Studiengang	MSc MF				
Studienabschnitt	Semester 2 Q3				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Statistics & Econometrics, Python				
Kurzbeschreibung / Lerninhalte	Advanced data analytics employs techniques from machine learning and artificial intelligence to sift through large and even unstructured data to reveal patterns and identify trends to yield more accurate judgments and better-informed decisions. The aim of machine learning is to make a computer learn from data without explicitly programming it how to do so, and the fruits of machine learning are all around us: email spam filters classify your messages, postal services read and route billions of hand-written letters every month, online businesses recommend products to customers, and speech-to-text transcribers now match the accuracy of human transcribers opening the possibility of real-time language translation – all using contemporary machine learning techniques. Financial institutions increasingly apply these very same techniques to an expanding range of problems, leveraging an increasing volume of data through daily operations and third-party sources to manage portfolio risk, perform trades, detect fraud, comply with regulations, and much, much more. This course is a hands-on introduction to contemporary regression-based techniques in machine learning, with a focus on supervised learning algorithms (used to make accurate predictions about the future from current data) and unsupervised learning (used to discover unknown structure in your current data). Because applications in this field are fast moving, the focus of this course is to give students a working understanding of core ML techniques backed by a solid theoretical understanding of how these algorithms work.				

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On the successful completion of this module, students will have a rudimentary understanding of regression-based techniques in machine learning, with a focus on supervised learning algorithms (used to make accurate predictions about the future from current data) and unsupervised learning (used to discover unknown structure in your current data).

Skills:
Upon the successful completion of this module, students will have a hands-on experience implementing several core machine learning algorithms used in data analytics.
Specifically, upon successful completion of the programming assignments for the course, students will have fully working implementations of

- Single and Univariate Regression models
- Gradient Descent for multiple features
- Logistic regression for multiple features
- CART models
- Time Series Analysis & Forecasting
- A complete Neural Network, including implementations of a neural network cost function and back propagation for non-linear classification
- K-means clustering

Competencies:
The course is designed to be a hands-on introduction to machine learning. To that end, students who successfully complete the course will be able to pursue two tracks:

- Students will have a rudimentary but working knowledge of how contemporary ML algorithms work, enabling them to be informed “citizen analysts” and to collaborate with data science teams.
- Students without prior experience but with an interest to pursue studies in data science will be prepared to study an introduction to machine learning course in a computer science department or to follow one of several technical online courses in ML, statistics and data science.

</td></tr>
<tr><td>Lernformen, Methodik und Betreuung</td><td>

The course will consist in theoretical lectures, where theory and programming tips are covered, and tutorials, where students will begin work on that week’s programming assignment, which will be completed outside of class.

In addition to the Professor, there will the Teaching Assistants for the course available to help students.

</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Five (5) Programming Assignments</td><td>tbd</td><td>70</td><td>During the module</td></tr>
<tr><td>Written exam</td><td>50 min</td><td>50</td><td>Written exam</td></tr>
</table>

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</table>

Literaturhinweise	We will use the following resources: • Gregory Wheeler (2020) “Lecture Notes for Machine Learning.” Available from the course website • Michael A. Nielsen (2015), Neural Networks and Deep Learning. Determination Press.Url: http://neuralnetworksanddeeplearning.com/ In addition, for programming tips in Python, students may wish to consult • Wes McKinney (2013), Python for Data Analysis. Sebastopol, CA: O’Reilly.
Modulstruktur	The module structure consists of four components: 1. Preparation for each lecture by reading the assigned material prior to class 2. Attend all tutorials with a laptop with all software installed and ready prior to class 3. Complete all programming assignments and submit them on-time and in the correct format 4. A final exam
Verwendbarkeit für andere Module und Programme	Subsequent modules in all concentrations
Letztes Freigabedatum	21.01.2020

Financial Markets and Institutions [FIN72018]

Modulkoordinator		Fecht, Falko			
Studiengang		MSc MF			
Studienabschnitt		Semseste 2 Q4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Other core modules			

Kurzbeschreibung / Lerninhalte	This course deals with the economic role of different financial institutions. In the first part we will focus on traditional banks. We will discuss frictions in financial markets that allows banks to add value as an intermediary. We will also analyse how banks add value in mitigating these market frictions. Based on these insights we will study why banks are fragile and affected by financial contagion. This permits us then to assess thoroughly how the government in general can alleviate the consequences of financial crises. For instance, we will study how the central bank can act as a lender of last resort to prevent liquidity crises. Furthermore, we evaluate different measures to assess and strengthen the resilience of financial institutions, such as capital and liquidity regulation and stress testing. In this regards, we will also discuss how the European banking union affects the Euro area's financial system. The second part is devoted to other financial intermediaries. Here we will first discuss the shadow banking sector in general. We will analyse how the shadow banking sector, in contrast to traditional banks, channels funds from savers to borrowers and which financial institutions are involved in this process. We will study how the different entities of the shadow banking sector help mitigate financial market frictions and add value. Besides this we will also learn about the risks inherent in the shadow banking sector and discuss mechanisms that can lead to financial contagion among these financial institutions. Finally, we analyse how financial innovations change banks' business models and how they change the interplay between banks and other financial institutions, in particular shadow banks and FinTechs. ---
Qualifikationsziele / Lernergebnisse	Upon completion of the course, students have a solid understanding of the role of different financial institutions and of the key drivers of structural changes in the financial sector. They are able to evaluate how financial institutions are affected by a changing environment. More specifically, students have a thorough knowledge of threats to the stability of individual financial institutions and of mechanisms endangering the resilience of large parts of the financial system. In addition, students understand the reasons for financial regulations enabling them also to assess the consequences of regulatory changes for the financial industry.
Lernformen, Methodik und Betreuung	• Lecture • In-class exercises • Case studies • Student presentations

<table>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Case study (paper and presentation):</td><td>tbd</td><td>60</td><td>During the module</td></tr>
<tr><td>Written exam</td><td>60 minutes</td><td>60</td><td>Exam week</td></tr>
</table>

Type of examination Duration or length Performance Points Due date or date of exam
Case study (paper and presentation): tbd 60 During the module
Written exam 60 minutes60 Exam week

</td></tr>
<tr><td>Literaturhinweise</td><td>

Greenbaum, Stuart I. and Thakor, Anjan V. 2007. Contemporary Financial Intermediation, 2. edition, Academic Press, Parts I, II, III, V, & VI.
European Central Bank. 2014. "Fire Sale Externalities." Financial Stability Report, November 2014, pages 99-109.
Bakk-Simon, Klára, Stefano Borgioli, Celestino Giron, Hannah Sabine Hempell, Angela Maddaloni, Fabio Recine, and Simonetta Rosati (2012) Shadow banking in the Euro area: an overview, European Central Bank, Occasional paper 133.
Morrison, A. D. and W. J. Wilhelm (2007) Investment Banking – Institutions, Politics, and Law, Oxford University Press. (especially chapters 1-3).
Gorton, Gary and Matrick, Andrew. (2010) Hair cuts, Federal Reserve Bank of St. Louis Review, November/December 2010, 92 (6), pp. 507-19.

</td></tr>
<tr><td>Modulstruktur</td><td>

Introduction
Frictions in Financial Markets
The Role of Banks in Corporate Lending
Banks as Liquidity Insurance
Fragility of the Banking Sector
Government Intervention in the Banking Sector
Banking Regulation
The Shadow Banking Sector
Investment Bank
Financial Innovations and FinTechs

</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>Master's Thesis</td></tr>
<tr><td>Letztes Freigabedatum</td><td>12.02.2019</td></tr>
</table>

Frankfurt School of Finance & Management
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Machine Learning I [INF72010]

Modulkoordinator		Wheeler, Gregory			
Studiengang		MSc MADS			
Studienabschnitt		3rd Quarter			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Semester 1,, Python			
Kurzbeschreibung / Lerninhalte		Advanced data analytics employs techniques from machine learning and artificial intelligence to sift through large and even unstructured data to reveal patterns and identify trends to yield more accurate judgments and better-informed decisions. The aim of machine learning is to make a computer learn from data without explicitly programming it how to do so, and the fruits of machine learning are all around us: email spam filters classify your messages, postal services read and route billions of handwritten letters every month, online businesses and recommend products to customers, and speech-to-text transcribers now match the accuracy of human transcribers opening the possibility of real-time language translation - all using contemporary machine learning techniques. Financial institutions increasingly apply these very same techniques to an expanding range of problems, leveraging an increasing volume of data through daily operations and third-party sources to manage portfolio risk, perform trades, detect fraud, comply with regulations, and much, much more. This course is hands-on introduction to contemporary regression-based techniques in machine learning, with a focus on supervised learning algorithms (used to make accurate predictions about the future from current data) and unsupervised learning (used to discover unknown structure in your current data).			

Qualifikationsziele / Lernergebnisse	*Knowledge*: On successful completion of this module, students will have a rudimentary understanding of regression-based techniques in machine learning, with a focus on supervised learning algorithms (uses to make accurate predictions about the future from current data) and unsupervised learning (used to discover unknown structure in your current data). *Skills:* Upon the succesful completion of this module, students will have a hands-on experience implementing several core machine learning algorithms used in data analytics. Specifically, upon successful completion of the programming assignments for the course, students will have fully working implementations of • Single and Univariate Regression models • Gradient Descent for multiple features • Logistic regression for multiple features • CART models • Time Series Analysis & Forecasting • A complete Neural Network, including implementations of a neural network cost function and back propagation for non-linear classification • K-means clustering *Competencies:* The course is designed to be a hands-on introduction to machine learning. To that end, students who successfully complete the course will be able to pursue two tracks: • Students will have a rudimentary but working knowledge of how contemporary ML algorithms work, enabling them to be informed "citizen analysts" and to collaborate with data science teams. • Students without prior experience but with an interest to pursue studies in data science will be prepared to study an introduction to machine learning course in a computer science department or to follow one of several technical online courses in ML, statistics and data science.
Lernformen, Methodik und Betreuung	The course will consist in theoretical lectures, where theory and programming tips are covered, and tutorials, where students will begin work on that week`s programming assignment, which will be completed outside of class. In addition to the Professor, there will the Teaching Assistants for the course available to help students.
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-

Literaturhinweise	We will use the following resources: • Gregory Wheeler (2020) “Lecture Notes for Machine Learning.” Available from course website. • Michael A. Nielsen (2015), Neural Networks and Deep Learning. Determination Press. Url: http://neuralnetworksanddeeplearning.com/ In addition, for programming tips in Python, students may wish to consult 1. Wes McKinney (2013), Python for Data Analysis. Sebastopol, CA: O’Reilly
Modulstruktur	The module structure consists of four components: 1. Preparation for each lecture by reading the assigned material prior to class 2. Attend all tutorials with a laptop with all software installed and ready prior to class 3. Complete all programming assignments and submit them on-time and in the correct format 4. A final exam
Verwendbarkeit für andere Module und Programme	Subsequent modules
Letztes Freigabedatum	16.09.2020

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Visualising Big Data [INF72020]

Modulkoordinator	Tomak, Kerem				
Studiengang	Master in Applied Data Science				
Studienabschnitt	3rd Quarter				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Modules Computation Semantics: Data Structures and Algorithms has to be covered.				
Kurzbeschreibung / Lerninhalte	In this course we will study techniques and algorithms for creating effective visualizations based on principles and techniques from graphic design, visual art, perceptual psychology and cognitive science. The course is targeted both towards students interested in using visualization in their own work, as well as students interested in building better visualization tools and systems. In addition to participating in class discussions, students will have to complete several short visualization and data science assignments as well as a final programming project.				
Qualifikationsziele / Lernergebnisse	*Knowledge:* On successful completion of this module, students will have thorough comprehension of big data strategy implementation, i. e. they: • Can explain the benefits and limitations of different data visualization techniques. • Can explain use of big data in visualizations that drive business results. • Can understand and explain big data technology architecture in support of efficient information generation and distribution *Skills:* On successful completion of this module, students will have a thorough comprehension of big data strategy implementation, i. e. they: • Can extract information from large datasets, using a visualization tool • Can effectively use visualization tools to "tell stories" *Competence:* Upon completing the course, students will have the ability to create an end-to-end visualization delivery to support a business outcome/story.				
Lernformen, Methodik und Betreuung	Lectures, programming assignments, and exam.				

<table>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date or Date of Exam</td></tr>
<tr><td>Data processing and creating visualization</td><td>in class</td><td>40</td><td>in class</td></tr>
<tr><td>Programming assignments- Managing & Visualisuing</td><td>in class</td><td>40</td><td>in class</td></tr>
<tr><td>Final Exam</td><td>45 min</td><td>40</td><td>during exam week</td></tr>
</table>
</td></tr>
<tr><td>Literaturhinweise</td><td>

Yau, N.(2013) Visualisation that means something O`Reilly
Data Science for Business by Foster provost and Tom Fawcett
Data Visualisaiton with R: 100 examples by Thomas Rahlf
Show me the numbers: Designing Tables and Graphs to Enlighten by Stephen Few
Information Dashboard Design: Displaying Data for At-a-Glance Monitoring by Stephen Few
The Dos and Don`ts of Presenting Data, Facts, and Figures by Dona Wong

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<tr><td>Modulstruktur</td><td>Session Topic
1 The Purpose of Visualization
2 Data and Image Models Intro to Tableau
3 Visualization Design
4 Exploratory Data Analysis
5 Perception
6 Interaction
7 Data Science and AI Architecture to support visual delivery
8 Using Space Effectively: 2 D
9 Visual Explainers
10 Deconstructing Visualizations
11 Color
12 Graph Layout
13 Project Presentations</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>All subsequent courses, Master's Thesis</td></tr>
<tr><td>Letztes Freigabedatum</td><td>18.06.2020</td></tr>
</table>

AI & Humanity - Ethics of Data Science
[INF72030]

Modulkoordinator	Köhler, Sebastian				
Studiengang	Master in Applied Data Science				
Studienabschnitt	4th Quarter				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Previous module				
Kurzbeschreibung / Lerninhalte	This module explores ethical and legal challenges and questions that data scientists are likely to face in their professional lives working with and developing emerging information technologies. Issues that will be considered are, for example, privacy, responsibility, fairness, how such technologies impact the flow of information and what increasing automatization might mean for society. Participants will gain an in-depth comprehension of ethical and legal issues surrounding the work of data scientists and emerging information technologies, as well as the crucial ethical and legal questions that we should ask about such technologies. On successful completion of this module, students should have developed and strengthened their analytic and critical skills, as well as their ability to apply those skills to ethical and legal problems to develop solutions to those problems.				

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge: On successful completion of this module, students will have a thorough comprehension of central legal and ethical issues surrounding information technologies, as well as the crucial legal and ethical questions we must ask about such technologies, i.e. they can

- explain what ethical and legal questions information technologies raise for issues such as privacy, responsibility, or fairness.
- articulate what kinds of answers have been given to such ethical and legal questions and how those answer are supported.
- compare different responses to the relevant ethical and legal questions.

Skills: On successful completion of this module, students will be able to identify and evaluate legal and ethical problems related to information technologies, develop and critically assess appropriate responses to such problems, and to assess their own evaluative outlook critically, i.e. they can

- identify ethical and legal issues that information technologies raise and articulate and defend their own responses to these issues.
- critically assess arguments for and against positions taken in response to ethical and legal issues raised by information technologies.
- identify and reflect on evaluative assumptions presupposed by arguments made for or against particular uses of information technologies.

Competencies: On successful completion of this module, students should have developed and strengthened their analytic and critical skills, as well as their ability to apply those skills to ethcial and legal problems to develop solutions to those problems, i.e. they can

- anticipate and articulate legal and ethical issues that might be raised by novel technologies.
- articulate, develop, and defend novel responses on ethical and legal questions that are raised by various technologies.

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<tr><td>Lernformen, Methodik und Betreuung</td><td>Practical seminar with critical reflection</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><th>Type of Assessment</th><th>Duration</th><th>Performance Points</th><th>Due Date or Date of Exam</th></tr>
<tr><td>Argumentative exercises</td><td>tbd</td><td>30</td><td>during term</td></tr>
<tr><td>Discussion essay</td><td>tbd</td><td>30</td><td>during term</td></tr>
<tr><td>Independently researched essay</td><td>tbd</td><td>30</td><td>during term</td></tr>
<tr><td>Essay on legal issues</td><td>tbd</td><td>30</td><td>during term</td></tr>
</table>

</td></tr>
</table>

Literaturhinweise	• Boddington, Paula 2017. Towards a Code of Ethics for Artificial Intelligence, Berlin: Springer • Vollmann, Jeff and Matei, Sorin Adam (Eds.) 2016. Ethical Reasoning in Big Data, Berlin: Springer • Lin, Patrick, Jenkins, Ryan and Keith, Abney (Eds.) 2017. Robot Ethics 2.0, Oxford: Oxford University Press • Shafer-Landau, Russ 2015. The Fundamentals of Ethics, Oxford: Oxforl University Press
Modulstruktur	1. The Law & AI • Data Protection Law • Pioneering in Cyberspace and Cyberlaw 1. Ethics & AI • Introduction to Ethics & Philosophical Methodology • Privacy, Anonymity, Consent, and Data Ownership • Algorithms and the Flow of Information: Filter Bubbles and Deception • Fairness, Justice, and Discrimination • Accountability, Explainability and Ethical AI • Automatization and Humanity`s Future
Verwendbarkeit für andere Module und Programme	AI The New Frontier
Letztes Freigabedatum	18.06.2020

Machine Learning II [INF72040]

Modulkoordinator	Nagler, Jan				
Studiengang	Master in Applied Data Science				
Studienabschnitt	4th Quarter				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Pflicht				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Deutsch				
Workload: 150 h	Präsenz:	44 h	Selbststudium:	106 h	
Voraussetzungen für die Teilnahme	Quantitative Fundamentals & Machine Learning I				
Kurzbeschreibung / Lerninhalte	This course is an introduction to statistical machine learning and probabilistic data analysis involving highly parameterized models. Topics include time series analysis and variational inference.				
Qualifikationsziele / Lernergebnisse	*Knowledge:* On the successful completion of this module, students will have thorough hands-on experience implementing with standard statistical machine learning tools, in particular supervised and unsupervised machine learning models. Specifically, they knowledge • will have a deeper understanding of the mathematical and statistical foundations of machine learning • will have a better appreciation of the computational challenges to performing statistical inference on high-dimensional data • can explain the role that MCMC and sampling techniques play in approximate Bayesian inference *Skills:* • can implement sophisticated MCMP methods regression problems; • can build an ensemble of machine learning techniques to solve a complicated, real-world problem.				
Lernformen, Methodik und Betreuung	Lecture and programming assignments				

<table>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date or Date of Exam</td></tr>
<tr><td>Five (5) Programming Assignments</td><td>tbd</td><td>70</td><td>During Module</td></tr>
<tr><td>Final Exam</td><td>50 min</td><td>50</td><td>Exam Week</td></tr>
</table>
Graded Programming Assignments and Final Exam.
</td></tr>
<tr><td>Literaturhinweise</td><td>

- Kevin P. Murphy (2012), Machine Learning: A Probabilistic Perspective, MIT Press.

</td></tr>
<tr><td>Modulstruktur</td><td>

1. Regression, Regularization & Preprocessing
   a. Correlation-based dimensionality reduction
   b. Principle Component Analysis (PCA)
   c. Regularization
2. Bayesian Methods
   a. Latent Variables Models
   b. Expectation Maximization (EM)
   c. Variational Inference & Sampling (Gibbs & Metropolis)
   d. Markow Chain Monte Carlo (MCMC)
   e. Gaussian Mixture Model
   f. Hidden Markow models (HMM)
3. Supervides and Unsupervised Learning: Applications, Tools & Libraries

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<tr><td>Verwendbarkeit für andere Module und Programme</td><td>Co-op Project and thesis</td></tr>
<tr><td>Letztes Freigabedatum</td><td>18.06.2020</td></tr>
</table>

Information Systems [MGT71430]

Modulkoordinator		Beimborn, Daniel			
Studiengang		MSc MiM			
Studienabschnitt		Semester 2			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Basic knowledge about business information systems, as taught in undergraduate programs in business Administration.			

Kurzbeschreibung / Lerninhalte	The “Information Systems" module aims at establishing the foundations required for managing information systems in a business environment. The course introduces and refreshes participants’ knowledge about fundamental concepts of IT infrastructure and applications, including recent trends such as cloud computing or enterprise social media. This basic knowledge is then reflected by applying theories from strategic management as lens to evaluate their “value” in terms of their potential for contributing to a firm’s strategic goals. Building on these foundations, general principles of IT strategy, IT governance, and different models of IT value generation will be introduced and discussed. The students will learn about the different roles in IT management, different ways to structure the IT function and the common approaches to organize IT operations and services. The course will follow the subsequent agenda (changes might apply): • *The IT Resource*: defining IT and information systems (IS). Overview about different types of technologies, information systems, trends. The resource-based view of IT, IT assets. • *IT strategy*: Types of IT strategy, developing an IT strategy, aligning the IT strategy with the business strategy • *IT Architecture*: Fundamentals of IT architecture and Enterprise Architecture Management (EAM) • *IT Governance*: Role of the CIO. Setting up an IT organization. Discussing different paradigms and approaches of managing IT • *IT Operations*: Basics about IT operations and IT service management as well as “IT controlling”, including the widely used frameworks of ITIL and COBIT. Management of outsourcing and offshoring arrangements.

Qualifikationsziele / Lernergebnisse	*Knowledge:* On successful completion of this module, students will have a thorough comprehension of different concepts, approaches and technologies in the field of managing corporate information systems, i.e. they can: • Describe the relevance, technologies, and management of information systems • Outline the relation between IT strategy, business/IT alignment, IT architecture, IT organization, and IT operations • Identify different roles in IT management • Illustrate the common approaches to organize IT operations and services *Skills:* On successful completion of this module, students will have the proven ability to apply skills for analyzing management questions regarding choice of technologies, for developing IT strategies that support the goals of their firm, for structuring the IT governance, and for establishing effective IT services/operations, i.e. they can: • Compare and reflect the different approaches • Analyze technological trends such as cloud computing or enterprise social media • Create ways to structure the IT function and to source IT services *Competencies:* On successful completion of this module, students can take responsibility for group projects in the "IT world" and serve as valuable experts at the interface between a firm's IT function and business units and communicate with IT experts in a business setting, i.e. they can: • Evaluate and communicate the value of IT in terms of potential benefits • Manage successful IT exploitation within organizations • Contribute to a firm's strategic utilization of IT and information systems
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-
Literaturhinweise	Will be announced during the course
Modulstruktur	
Verwendbarkeit für andere Module und Programme	Modules in the Digital Business concentration, Master's Thesis
Letztes Freigabedatum	26.01.2018

Innovation Management [MGT71410]

Modulkoordinator		Schlapp, Jochen			
Studiengang		MSc MiM			
Studienabschnitt		Semester 3			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		None			
Kurzbeschreibung / Lerninhalte		In most industries, good R&D performance is critical to generate and sustain a lasting market success, and at the heart of every R&D process is a firm's innovation management. Starting with the generation of possible innovation opportunities, and continuing with the selection of the most promising ideas and the transformation of these ideas into final products, innovation management has to deal with a set of utterly diverse challenges. For instance, should innovation be incremental or radical; or what are the benefits and costs of open innovation? This course sets out to discuss the key challenges that are inherent to innovation and product development processes. To this end, the course also introduces students to business model innovations and the impact of new technologies on existing R&D strategies.			

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On successful completion of this module, students will have a thorough comprehension of principal concepts and theories in innovation and R&D management; i.e., they can:
- explain the main concepts and theories of innovation management,
- identify the key challenges in different stages of the innovation process,
- understand the impact of R&D decisions on firm performance.

Skills:
On successful completion of this module, students will have the proven ability to apply advanced knowledge in innovation management and to solve complex managerial problems; i.e., they can:
- apply theories and concepts to analyse and optimise real-world problems,
- evaluate the interactions between different strategic decisions and create strategic alignment,
- design organisational structures that promote innovation,
- evaluate the benefits and shortcomings of different innovation processes.

Competencies:
On successful completion of this module, students can:
- develop a coherent innovation strategy,
- structure innovation processes,
- evaluate the impact of innovation on firm performance.

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<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures, classroom discussions, classroom experiments, case presentations</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Final written exam</td><td>60 min</td><td>60</td><td>End of the module</td></tr>
<tr><td>Presentation (group)</td><td></td><td>35</td><td>During the module</td></tr>
<tr><td>Quizzes</td><td></td><td>15</td><td>During the module</td></tr>
<tr><td>Class participation</td><td></td><td>10</td><td>During the module</td></tr>
</table>

</td></tr>
</table>

Literaturhinweise	• Christensen. 2000. The Innovator's Dilemma. Harvard Business Review Press. • Girotra, Netessine. 2014. The Risk-Driven Business Model. Harvard Business Review Press. • Loch, Kavadias. 2008. Handbook of New Product Development Management. Butterworth-Heinemann. • Ries. 2017. The Lean Startup. Currency. • Schilling. 2015. Strategic Management of Technological Innovation. McGraw-Hill.
Modulstruktur	Lectures will be scheduled over the course of the semester. A high degree of active student involvement is expected. The conceptual and theoretical discussion will be supplemented by case studies, classroom experiments, and group work in class.
Verwendbarkeit für andere Module und Programme	Concentrations: Strategy, Technology & Operations, Digital Business; Thesis
Letztes Freigabedatum	08.08.2017

Strategic Management [MGT71560]

Modulkoordinator		Fitza, Markus			
Studiengang		MSc MiM			
Studienabschnitt		Semester 2 Q3			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Business Economics			
Kurzbeschreibung / Lerninhalte		Strategy is about why some firms are successful and others are not. The course develops an understanding of how firms can design processes in markets and organisations to achieve competitive advantages. The first part of the course offers a comprehensive overview of how market processes affect firm profitability. The second part discusses how organisational processes contribute to competitive advantages.			

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On successful completion of this module, students will have a thorough comprehension of principal concepts and theories in strategic management, i.e. they can:
- Explain the main concepts and theories of strategic management,
- Outline how industry- and firm-level factors contribute to financial performance.

Skills:
On successful completion of this module, students will have the proven ability to apply advanced knowledge in Strategic Management and to solve complex managerial problems, i.e. they can:
- Apply theories and concepts to analyse real-worlds problems in firms and industries,
- Analyse how firm-level factor contribute to performance
- Identify how market processes affect firm profitability,
- Evaluate the advantages and disadvantages of alternatives corporate and business strategies.

Competencies:
On successful completion of this module, students can:
- Structure the strategic analysis of firms and markets,
- Present and argue for a strategic analysis,
- Develop strategic recommendations,
- Argue the advantages and disadvantages of strategic recommendations.

</td></tr>
<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures, classroom discussion, classroom experiments, case presentations</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Group presentation</td><td>20 min each</td><td>60</td><td>During the term</td></tr>
<tr><td>Class participation</td><td></td><td>20</td><td>During the module</td></tr>
<tr><td>Exercises and quizzes</td><td></td><td>40</td><td>During the module</td></tr>
</table>

</td></tr>
<tr><td>Literaturhinweise</td><td>I recommend the following books: “Strategic Management”, by Dess, Lumpkin and Eisner and Besanko et al., Economics of Strategy, 7th edition, Wiley 2017. But this is not a requirement, you can use the books as a reference source.</td></tr>
<tr><td>Modulstruktur</td><td>Lectures will be scheduled over the course of the semester. A high degree of active student involvement is expected. The conceptual and theoretical discussion will be supplemented by case studies, classroom experiments, and group work in class.</td></tr>
</table>

Verwendbarkeit für andere Module und Programme	Concentration Strategy & Organisation; Master's Thesis
Letztes Freigabedatum	17.12.2019

Operations Management [MGT71320]

Modulkoordinator		Kremer, Mirko			
Studiengang		MSc MiM			
Studienabschnitt		Semester 2			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Basic Statistics (in particular, probability distributions), elementary calculus and algebra, basic spreadsheet engineering skills (i.e., working knowledge of Microsoft Excel).			
Kurzbeschreibung / Lerninhalte					

Qualifikationsziele / Lernergebnisse	This course introduces principles, technologies, and tools designed to increase organizational performance by better matching supply with demand in an uncertain world. A key objective is the acquisition of a set of key methods you can use as a manager to control and improve operations. Besides illustrating the underlying principles of these tools, we will challenge your managerial skills and ask you to apply them in realistic settings. *Knowledge:* On successful completion of the module, the participants will have knowledge of a wide range of operations management tools, i.e. they • understand the fundamental concepts of any business process: throughput, throughput time, work in process and the relationship between the three. • can explain and operate the toolset introduced in this module • can evaluate the tools and discuss their strengths and weaknesses *Skills:* On successful completion of the module, students will have the proven ability to apply advanced knowledge in Operations Management and to solve practice-oriented challenges, i.e. they can • analyze, structure and classify operations management challenges in practice and theory • identify the problem adequate quantitative model or qualitative strategy • apply the adequate quantitative model or qualitative strategy to solve an operations management challenge • use spreadsheets to support quantitative modeling *Competencies:* Successful module participants develop the requisite know-how to provide responsible contributions in establishing concepts and processes in operations management. They acquire the ability to further develop and adapt to the needs in practice. They can • articulate the operational rationale behind a successful business process • present operations management challenges to a broad audience • argue competently about problem solution strategies

Lernformen, Methodik und Betreuung	The course is a combination of case study discussions, lectures, tutorials, technical exercises, and games. The course is based on the text book shown under recommended literature. Essentially, the class instructional format will be a dialogue between the students and the instructor. It is important to note that strong class participation is founded on adequate preparation. Students are expected to thoroughly review the material on every case or reading prior to its discussion in class. It is expected that students do a thorough analysis of the case based on specific questions that will be provided, and prepare a plan of action appropriate to the circumstances. When students are prepared, the class discussion is greatly enhanced and everyone learns far more than otherwise.
Art der Prüfungsleistungen im Modul und Akkumulationspunkte	-
Literaturhinweise	The following textbook provides most of the methodological backbone of this class: *Cachon and Terwiesch. Matching Supply With Demand - An Introduction to Operations Management. 3rd edition. McGraw Hill.* The textbook can be found in the FS library in reasonable numbers. All other course materials (slides, quizzes, assignments, tutorials, case studies) will be distributed electronically on the Learning Management System.
Modulstruktur	Sessions 1-4 deal with the fundamentals of design and management of business processes. Building on the fundamentals, Sessions 5–10 deal with the processes involved in matching supply with demand in uncertain, highly variable environments. Managing variability is a key underlying theme across the course. Session 11 is devoted to group presentations of medium-scale projects that require students to apply Operations Management principles, thinking, and tools to a real business process that they themselves interact with. With a more detailed break-down to follow at the beginning of class, it is built around this basic structure: 1. Introduction 2. Process Analysis 3. Process Improvement 4. Process Interruptions 5. Managing Quality 6. Managing Service Processes I 7. Managing Service Processes II 8. Managing Inventory I 9. Managing Inventory II 10. Operations-Driven Business Model Innovation 11. Operations in the wild: Group presentations

Verwendbarkeit für andere Module und Programme	All concentrations. Some electives.
Letztes Freigabedatum	30.01.2018

Leadership and Organisational Behaviour
[MGT74910]

Modulkoordinator		Rerup, Claus			
Studiengang		MSc MiM			
Studienabschnitt		Semester 2 Q4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Basic knowledge of organizational behavior/theory, scientific training beyond the bachelor level in some discipline.			
Kurzbeschreibung / Lerninhalte		Business organisations of all types face chronic management and leadership problems that pose significant challenges to them. These problems include the difficulty of designing organisations capable of coping with highly dynamic business environments, the challenge of developing strategies and structures for hypercompetitive conditions, the greater complexity of managing global enterprises, the difficult task of shaping a corporate culture, managing politics and conflict between individuals and organisational units, motivating employees who are more mobile than ever, leading managerial teams effectively, and so on. These and other challenges, and how leaders of organisations can deal with them, are the subject of this course.			

Qualifikationsziele / Lernergebnisse	The course will introduce you to tools and frameworks that will help you understand and manage the challenges posed by leadership in modern organisations. These frameworks will provide you with a better basis for evaluating organisations and the people within them. In addition to providing you with a framework for understanding leadership challenges, a second objective of this course is to teach you skills in applying those theories and frameworks to leadership situations with appropriate solutions. Leadership skills are most effectively developed through practice. Therefore, it is essential that you have considerable opportunity to work on actual leadership problems. In order to do this we will rely heavily on case analyses. Cases and various exercises will provide the material to practice analysing and addressing leadership challenges. You are expected to carefully analyse all of the cases, prepare your thoughts on them, and participate in the analyses in class. It is my hope that by the end of the term, you will be able to see organisational and leadership problems in ways you could not see them before. More importantly, you will leave the course more conscious of the consequences related to the choices you make as a leader in an organisation. *Knowledge:* On successful completion of this module, students will have a thorough comprehension of principal concepts and theories in leadership and organisational behavior, i.e. they can • explain the main concepts in leadership and organisational behaviour • illustrate key constructs by means of case studies and real-time stories in the news • outline the relevance and irrelevance of leader • apply course material to their own context, and draw implications for how to act *Skills:* On successful completion of this module, students will have the proven ability to apply advanced knowledge in leadership and organisational behaviour and to solve complex managerial problems, i.e. they can • apply theories and concepts to analyse real-worlds problems • evaluate leadership and organisational behaviour problems from different perspectives (logics) • draw relational maps and apply them to leadership and organisational behaviour problems *Competencies:* On successful completion of this module, students can • structure the analysis of leadership and organisational behaviour problems across the individual, team and organisational levels of analysis • develop leadership and organisational behaviour recommendations • argue for the pros and cons of specific recommendations
Lernformen, Methodik und Betreuung	Lectures, classroom discussion, classroom experiments, case presentations, team work

<table>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>The grade for this course will be computed from the following components:
<table>
<tr><th>Type of examination</th><th>Duration or length</th><th>Performance Points</th><th>Due date</th></tr>
<tr><td>Team project assignment</td><td></td><td>65</td><td>Sunday May 31, 2020 at midnight</td></tr>
<tr><td>Individual Fall from Grace assignment</td><td></td><td>30</td><td>Sunday June 7, 2020 at midnight</td></tr>
<tr><td>Individual online class contribution</td><td></td><td>10</td><td>During the semester</td></tr>
<tr><td>Individual application challenges</td><td></td><td>15</td><td>Sunday May 3, 2020 at midnight; Sunday May 17, 2020 at midnight</td></tr>
</table></td></tr>
<tr><td>Literaturhinweise</td><td>There is no text book for this course. The course consists of selected readings and cases.</td></tr>
<tr><td>Modulstruktur</td><td>Lectures will be scheduled over the course of the semester. A high degree of active student involvement is expected. The conceptual and theoretical discussion will be supplemented by case studies, video cases, tests, classroom experiments, and team work in class.</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>Electives, Master's Thesis</td></tr>
<tr><td>Letztes Freigabedatum</td><td>06.01.2020</td></tr>
</table>

ESG Investing: People. Power. Profit
[MGT70481]

Modulkoordinator		Newton, Andrew William			
Studiengang		MoF, MiM			
Studienabschnitt		Semester 4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	37 Academic Hours	Selbststudium:	122 h
Voraussetzungen für die Teilnahme		Principles or Foundations of Finance. Basic ethics. Bachelors Degree in business			

Kurzbeschreibung / Lerninhalte	This course is designed to complement your quantitative skills in financial analysis and portfolio management with the conceptual and analytical insights needed to compete for jobs in what the Financial Times has called the ESG 'war for talent' – the current high demand for those with the knowledge and skills necessary to integrate environmental, social, and governance (ESG) factors into investment decision-making. Coverage includes: • Three motives for ESG investing: people, power, and profit • Stakeholder analysis for investors • Understanding transmission mechanisms from values to value • The central role of reputation and company culture in linking values to value • The 'E' and the 'S': seeing business through the lenses of human rights, justice and sustainability. • The 'G': corporate governance paradigms, risks and opportunities • ESG data challenges, and reporting standards related to ESG analysis • Stewardship strategies: engagement, coalition-building, voting, resolutions, and exit • Fixed income ESG and the green bond phenomenon • Climate change as a cross-cutting issue Some work each day is conducted in teams of your own choice. Among other tasks, you will get time to work on your deliverable for the group presentation assessment in the final session. I will be available to spend time with each team during these periods to talk through issues you have encountered in your presentation.

Qualifikationsziele / Lernergebnisse	Knowledge: Upon successful completion of this module, students will know and understand the rationales for, core concepts of, and approaches to the integration of environmental, social, and governance factors into investment decision-making e.g. they will be able to: • Identify and explain the three main drivers (people, power, profit) for integrating ESG insights into investment (and therefore corporate) decision-making; • Explain the ethical and political norms against which ESG performance is benchmarked, including human rights, justice, and sustainability; • Identify a firm's stakeholders, and explain the significance of the different bases on which stakeholders are connected to an enterprise for value creation and risk; • Identify and explain a selection of key current ESG performance issues, including climate change and diversity; • Explain the various transmission mechanisms by which values performance affects firm value and risk both for equity and fixed income investors, including the mediating role of reputational resources such as trust and legitimacy; • Locate relevant, comparable, and robust data on firm ESG performance; • Identify the range of stewardship strategies open to investors wishing to influence portfolio companies on their ESG performance, and explain the success factors required for each. Skills: Upon successful completion of this module, students will be able to (complete the following tasks/solve the following problems): • Analyse a firm's stakeholders, and the different capacities in which each is connected to the enterprise; • Identify performance benchmarks for existing ESG concerns such as climate change, diversity, and global inequality in terms of specific ethical, political, and industry norms, and identify emerging ESG concerns in the same terms; • Research data on a firm's ESG performance and analyse that performance against norms and peers; • Analyse the available tactical choices available for the stewardship of an investment and identify those most likely to succeed. Competence: Upon successful completion of this module, students will have learned about how to integrate environmental, social and governance concerns into investment strategy, selection, and stewardship. Specifically, they will be ready to: • Undertake robust research and analysis of a firm's ESG performance; • Craft compelling arguments applying ESG performance insights for input to portfolio strategy formulation and investment selection processes;

<table>
<tr><td></td><td>

- Devise and execute realistic strategies for the ongoing stewardship of portfolio assets in line with client ESG objectives.

</td></tr>
<tr><td>Lernformen, Methodik und Betreuung</td><td>Pre-course readings, interactive lectures, group work, case studies, classroom exercises, student presentations.</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><th>Type of examination</th><th>Duration or length</th><th>Performance Points</th><th>Due date or date of exam</th></tr>
<tr><td>Individual quiz</td><td>20 minutes</td><td>20</td><td>End of Friday afternoon</td></tr>
<tr><td>Group presentations</td><td>20 minutes per group</td><td>70</td><td>Last session Saturday morning</td></tr>
<tr><td>Individual Multiple-Choice exam</td><td>30 minutes</td><td>30</td><td>Exam week</td></tr>
</table>

- The assessments have the potential for a maximum 120 points in total. Full instructions and grading rubrics are set out in the Assessments Pack.
- The Group Presentation assessment requires self-selected groups of students to evaluate a given company stock and/or bond from an ESG perspective, including articulation of a stewardship strategy. The 20-minute presentation takes place on the last afternoon of class. (70 points)
- The Individual Multiple-Choice Exam is an individual test taken during exam week. The test contains 30 questions and lasts 30 minutes. (30 points)
- The Canvas-based Individual Exercise requires students to complete a set of questions related to an analysis of the ESG performance of a particular company. This exercise lasts 20 minutes and will be scheduled during the Friday afternoon. (20 points)

Students should review the Assessments Pack for detailed instructions and grading rubrics.

</td></tr>
<tr><td>Literaturhinweise</td><td>

- Schoenmaker, D., and Schramade, W. Principles of Sustainable Finance. Oxford: Oxford University Press. 2019.

</td></tr>
<tr><td>Modulstruktur</td><td>Lectures take place in one concentrated block-week</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>N/A</td></tr>
<tr><td>Letztes Freigabedatum</td><td>18.09.2020</td></tr>
</table>

Mergers & Acquisitions [FIN72090]

Modulkoordinator	Hirst, Simon				
Studiengang	MoF; MiM				
Studienabschnitt	Semester 4				
Moduldauer	1 Semester				
Pflicht-/Wahlpflichtmodul	Wahl				
Credits:	6				
Häufigkeit des Angebots	Jährlich				
Sprache	Englisch				
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme	Principles or Foundations of Finance. Bachelor Degree in Business. Basic level of Accounting. Basic Level of Excel modelling skills				

Kurzbeschreibung / Lerninhalte	• Origins of Merger & Acquisition activity and rationale thereof
	• Technical explanation of mergers versus acquisitions and partial mergers, and reverse mergers
	• Benefits & risks of M&A transactions - Revenue & Cost Synergies
	• Detailed Merger & Acquisition Case Studies, including a selection of:
	  • *Merger of AOL and Time Warner*
	  • *Potential Merger of Kraft Heinz & Unilever*
	  • *Merger of BAT and RJ Reynolds*
	  • *Countrywide – Distressed Restructuring*
	• Valuation in the Context of Mergers & Acquisitions
	• Concept of How an M&A Transaction Works from a Numerical Perspective
	• *Key Accounting Concepts Relating to M&A Analysis*
	• Financing Acquisitions & the benefits/risks of Leverage
	• *Summary Pro Forma M&A Analysis using Excel spreadsheets*
	• *Explanation of a fully dynamic "three dimensional" analytical M&A and Forecasting Model using Excel*
	
	The class will build a 3-dimensional LBO Model in Excel in class
	
	During some full or partial afternoon sessions, the class will be divided into teams of their own choice and work on a detailed Case Study relating to a potential merger of two large real European consumer products companies, both household names. The professor will mentor each team, one-by-one in turn during these group working sessions. Each Group will present their cases in the final session, as shown below.				

Qualifikationsziele / Lernergebnisse	*Knowledge:* Upon successful completion of this module, students will gain knowledge about the process of M&A transactions, i.e. they can: • Explain the rationale for M&A transactions and how deals work from a broad numerical and strategic perspective • Judge what makes deals successful and what makes them fail *Skills:* Students will be taught using exactly the same methodology as they would learn working full time at a major investment bank or private equity firm. Upon successful completion of this module, students will be able to: • Analyse M&A transactions in detail, with different structures and deal parameters • Formulate an approach which is entirely consistent with strategic and financial priorities. This is relevant for those who want to pursue a career in corporate finance within a large company, management consulting, investment banking and private equity • Understand the basic elements of "three dimensional" analysis in Excel (made simple) which is highly relevant to both an entrepreneurial and corporate career, as well as finance/investment banking/private equity • Understand how to build an LBO Model with three dimensional architecture *Competence:* Upon successful completion of this module, students will have learned about all aspects of M&A, i.e. they can: • Analyse transactions in manner that is consistent with both a classic theoretical approach and real business practices on Wall Street
Lernformen, Methodik und Betreuung	Conceptual lectures, case study lectures, class excel work, and professor/students study groups

<table>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

Type of examination	Duration or length	Performance Points	Due date or date of exam
Group case study	20 minutes per group	70	Last afternoon
Individual Multiple Choice exam	30 minutes	30	Exam week
Individual Excel quiz	20 minutes	20	End of last morning

Students need to bring a laptop to each class with Microsoft Office software installed
The assessments have the potential for a maximum 120 points in total
The Group Case Study will involve groups of students evaluating a specific M&A situation and presenting it on the last afternoon of class in a 20-minute slide presentation summarizing issues relating to the transaction, in accordance with a list of questions distributed on the first day of Class. 70 points are available for this case study.
The Individual Multiple Choice Exam is an individual test taken during exam week. There will be 30 questions to be answered in 30 minutes. Each question has 4 possible answers, only 1 of which is correct. Each correct answer gets 1 point, with no deductions for wrong answers, giving 30 available points for this exam.
The Individual Excel Quiz will involve students completing a specific schedule in Excel, based upon tables taught in class. This test lasts 20 minutes and will be scheduled just before lunch on the last day of classes. There are 20 available points for this exam.
Students should review the attached procedures and grading criteria for each assignment

</td></tr>
<tr><td>Literaturhinweise</td><td>

Hirst, Simon: 3-D Concept Course Notes (2017)
Hirst, Simon: Model Structure Course Notes (2017)

These notes are extensive and so take the place of all other course related materials. Both documents will be distributed to all participants in advance of the course.
</td></tr>
<tr><td>Modulstruktur</td><td>Lectures take place in two concentrated block-weeks</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>This elective is one of the potential prerequisites for the Advanced Merger & Acquisitions</td></tr>
<tr><td>Letztes Freigabedatum</td><td>23.05.2019</td></tr>
</table>

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Quantitative Trading and Analysis with Python [FIN70970]

Modulkoordinator		Vilkov, Grigory			
Studiengang		MiM, MoF			
Studienabschnitt		Semester 4			
Moduldauer		-			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Recommended: successful completion of the modules Quantitative Portfolio Management or Portfolio Risk Management, or possession of comparable understanding and skills in the area of portfolio allocation methods, factor models, optimization techniques, statistics and econometrics.			
Kurzbeschreibung / Lerninhalte		1. Principles and practice of data manipulation in Python (import, storage, preparation for quantitative trading systems), using Pandas and selected APIs for data access 2. Principles and development of trading systems, with emphasis on low frequency (not low-latency algo trading systems) quantitative trading 3. Python/ Quantopian as language/ platform of choice for quantitative trading 4. Examples of trading systems/ path to developing a trading system/ course project to develop a particular trading system in Quantopian environment			
Qualifikationsziele / Lernergebnisse		By the end of the course the students will be able to develop a quantitative trading system, including 1. Identification of an idea for trading using academic literature 2. Formulation of an algorithms 3. Identification of data needs, creating, cleaning, and preparing data for the system 4. Programming a system prototype (using Python and/ or Quantopian environment) 5. Backtesting and anslysis of the quantitative trading system			

<table>
<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures with theoretical and practical examples
Programming assignments in class and at home
Group project involving devlopment of a quantitative trading strategy, its implementation, and description of results (with a short presentation in the class if time permits)</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date/ Date of Exam</td></tr>
<tr><td>Home assignments (individual)</td><td>during the module</td><td>40</td><td>weekly</td></tr>
<tr><td>Course project (group)</td><td>during the module</td><td>30</td><td>Last week of the module</td></tr>
<tr><td>Written exam</td><td>50+10 min</td><td>50</td><td>Exam week</td></tr>
</table>
</td></tr>
<tr><td>Literaturhinweise</td><td>Technical documentation for Python and selected packages (numpy, pandas, scipy and some others)
Quantopian (manuals and guides)
Additional materials will be specified before the start of the course</td></tr>
<tr><td>Modulstruktur</td><td>TBD by January 2020</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>The course provides a natural path to the master thesis work</td></tr>
<tr><td>Letztes Freigabedatum</td><td>15.08.2019</td></tr>
</table>

Practical Data Science and Artificial Intelligence in Python [MGT63436]

Modulkoordinator		Strube, Moritz			
Studiengang		MADS, MoF & MiM			
Studienabschnitt		4. Semester			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Pflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	37 Academic Hours	Selbststudium:	122 h
Voraussetzungen für die Teilnahme		? Linear Algebra, probability theory, statistics? Statistical foundation of machine learning? General understanding of computer algorithms and data structures ? Basic Python skills? Laptop with internet access, Google Chrome installed and a Google account			
Kurzbeschreibung / Lerninhalte		In this course, students will apply the theoretical knowledge of Data Science and Artificial Intelligence acquired in other courses in practice by implementing programs in the computer language Python. In coding sessions with state-of-the-art tools, the most important topics in Data Science and Artificial Intelligence are covered. These include data sources, data import, data wrangling, data analysis, visualization, statistical modelling and model deployment. The course covers also topics like Cloud Computing, Mobile Computing, Edge-Computing and IoT in relation to Data Science and Artificial Intelligence.			
Qualifikationsziele / Lernergebnisse		At the end of the learning process the student is able to: • list some of the most important state-of-the-art-tools for Data Science and Artificial Intelligence • use these tools to analyze data and for implementing statistical models • interpret the results from statistical models • describe and explain the underlying methods • judge the suitability of approaches and methods • propose approaches for statistical analysis and statistical models • assess outcomes of data science and artificial intelligence projects • organize data science and artificial intelligence projects			

<table>
<tr><td>Lernformen, Methodik und Betreuung</td><td>Course with lectures and practical exercises. Hands-on sessions include programming tasks in Python. Students use their own laptop with Chrome installed and with their own Google account.</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date oder Date of Exam</td></tr>
<tr><td>In-class assignments</td><td>8h</td><td>120</td><td>During classes</td></tr>
</table>
</td></tr>
<tr><td>Literaturhinweise</td><td>• VanderPlas: Python Data Science Handbook[1]
• Hastie, Tibshirani, Friedman: The Elements of Statistical Learning (Introduction, Chapter 1)[2]</td></tr>
<tr><td>Modulstruktur</td><td>1. Introduction and recapitulation of Data Science and Artificial Intelligence topics
2. Introduction to state-of-the-art tools like Python, Jupyter, Numpy, Pandas and Tensorflow
3. Data Science and Artificial Intelligence coding sessions with online Jupyter notebooks
4. Implementing Data Science and Artificial Intelligence with Cloud Computing, Mobile Computing, Edge-Computing
5. Applying Data Science and Artificial Intelligence to IoT</td></tr>
<tr><td>Verwendbarkeit für andere Module und Programme</td><td>Master?s thesis</td></tr>
<tr><td>Letztes Freigabedatum</td><td>15.09.2020</td></tr>
</table>

Entrepreneurship and Business Model Innovation in the 3D Printing Era [MGT70921]

Module Coordinator		Fitza, Markus; Kremer, Mirko			
Programme(s)		MoF, MiM			
Term		Semester 4			
Module Duration		1 Semester			
Compulsory/Elective Module		Elective Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	37 Academic Hours	Independent Learning:	122 h
Prerequisites		A curious mind. Full of ideas. Some interest in technology.			

Content	The objective of this course is two-fold. The first objective is to introduce students to the disruptive potential of 3D Printing technology, which has begun to change the nature of products, the role of consumers, and the business models of entire industries. Unfortunately, few (aspiring) managers have been directly exposed to this revolutionary technology. As a result, few managers have acquired a solid understanding of the technology's impact on innovative business models, and the entrepreneurial processes through which innovative business models emerge. Against this backdrop, as its second objective, the course provides an environment in which students can experience many of the aspects of being an entrepreneur. It aims to provide students with an understanding of the entrepreneurial process and the various concepts, practices, and tools used in the entrepreneurial arena. The course has a strong focus on gaining experiences in entrepreneurial practice. We hope you will develop an entrepreneurial mindset, which should serve you well in whatever career you chose. One of the main reasons why entrepreneurs fail, is because they did not test their ideas early or quickly enough; they did not force themselves to expose their ideas to reality. This course is about learning how to avoid this trap, and developing an understanding of the conditions under which 3D printing can help with it. What the class is not about: This course is about learning the practice of being an entrepreneur. It is not about planning, it is about acting: It will not teach you how to write a business plan, it is not about how to get venture capital funding or how to analyse start-ups. The course cannot be successfully completed by only doing research in the library.

Intended Learning Outcomes	**Knowledge:** On successful completion of this module, students will have a thorough comprehension that entrepreneurship requires being active; they will have an understanding of the practice of entrepreneurship. They will also have gained an in-depth understanding of how, and under what conditions, additive manufacturing technology (i.e., 3D print) can unleash entrepreneurial activities. Students can: • Understand fundamental characteristics of 3D printing technology, vis-à-vis traditional manufacturing technologies. • Understand the economics of 3D printing in various settings. • Understand the implications of 3D printing on the design of Operating Systems. • Understand the implications of 3D printing on entrepreneurial activities. **Skills:** On successful completion of this module, students will have practiced many of the necessary skills needed to start entrepreneurial projects and companies. Specifically, they will have practiced how additive manufacturing technology (3D printing) can foster entrepreneurial activities. Students will develop various skill around: • Refining ideas • Testing assumptions that underlie an idea • Rapidly converting ideas into high quality prototypes (minimum viable products) • Talking to potential customers, getting feedback about entrepreneurial ideas • Creating experiments to test aspects of a business model • Drawing conclusions from experimental data • Testing ideas in the real world • Prioritizing and synthesizing work. • Communicating the potential of 3D printing. **Competencies:** On successful completion of this module, students can apply the skills described above.

Forms of teaching, methods and support	The main task of the class is to develop and test a business idea, leveraging the revolutionary potential of 3D printing technology. You will gain key skills that are relevant for entrepreneurs but which can also be applied to the wider business context. A primary focus of this class will be gaining experience in the practices needed to develop a venture business model. This will require some field work such as conducting experiments to test aspects of the model, talking to potential customers to better understand their needs and talking to potential partners to set up your business. The class instructional format, for the most part, will be an (team-) activity-based dialogue between the students and the instructors. It is important to note that strong class participation is founded on adequate preparation. When there are pre-class readings, we expect students to thoroughly read them. When students are prepared, the class discussion is greatly enhanced and everyone learns far more than otherwise.

<table>
<tr><td>Type of Assessment(s) and performance</td><td>
<table>
<tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date</td></tr>
<tr><td>Class participation</td><td>Throughout the module</td><td>20</td><td>During the module</td></tr>
<tr><td>Quizzes and exercises</td><td>TBA</td><td>40</td><td>During the module</td></tr>
<tr><td>Group project</td><td>TBA</td><td>60</td><td>Presentation: Session 11; Report: tbd</td></tr>
</table>

Class participation.
You can earn credit towards your class participation both inside and outside of the classroom. In order to contribute to in-class discussion, of course, you must show up. Please arrange your other activities to permit you to attend class; drop us a note if you cannot come. Mostly, our discussions will be free form: anyone who has something to contribute can and should. Students will be evaluated on the quality of the contributions (not the quantity).

Quizzes and Exercises
We will administer a small number of short quizzes to test your understanding of some concepts taught in class, as well as some background readings.

Group Project - Presentation & Report
You will begin with a problem for which your team will develop a product or service that is based on/utilises 3D printing as a solution. The task is to develop a viable business model for this solution. The main deliverables are a group presentation and a short “executive” write-up of the main conclusions and recommendations.
</td></tr>
<tr><td>Recommended Literature</td><td></td></tr>
<tr><td>Module Structure</td><td>The class will consist of roughly 35% lectures, 35% in-class exercises, 20% supervised learning and 10% site visits. A more detailed break-down to follow at the beginning of class.</td></tr>
<tr><td>Usability in other Modules/Programmes</td><td>Master's Thesis</td></tr>
<tr><td>Last Approval Date</td><td>2020/08/13</td></tr>
</table>

Insights into Manufacturing Industry
[MGT71461]

Module Coordinator		Thun, Jörn-Henrik			
Programme(s)		MoF; MiM; MADS			
Term		Semester 4			
Module Duration		1 Semester			
Compulsory/Elective Module		Elective Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	37 Academic Hours	Independent Learning:	122 h
Prerequisites		Operations Management			
Content		Covered industries are the following: Automotive Industry, Steel Industry, Machinery Industry, Electronics Industry, Pharmaceutical Industry, Chemical Industry, Aviation Industry, Food Industry, Apparel Industry, Defense Industry, Oil Industry & Energy Sector, Beverage Industry, Agricultural Industry, Furniture Industry, Tobacco Industry, Cosmetics Industry (subject to change) Hence, profound knowledge about the particularities of the respective industry is important for managers of all disciplines, not only for those with a specialization in manufacturing. However, this course is particularly interesting for students who are • interested in the manufacturing industry • want to learn about important business developments, or • want to get a deeper understanding of several industries			

<table>
<tr><td>Intended Learning Outcomes</td><td>

Knowledge:
The main purpose of this coiurse is to give insights into different industries . On successful completion of this module students can:
- illustrate the developments within the industry, describe typical products
- depict a typical supply chain of a company
- illustrate a typical production process for specific products
- identify global players and key suppliers
- understand relevant customer requirements
- reflect about ethical aspects
- illustrate the potential of Industry 4.0 for manufacturing companies

Skills:
Students will be able to analyse the business environment within the industry they are acting in.
On successful completion of this module students can:
- assess the specific situation a company has to deal with within the particular industry
- consider and evaluate diverse perspectives of a company and important decision domains in the specific business context

Competence:
After the successful completion of this module, students will acquire competence to
- prepare essential decisions in the respective business environment

</td></tr>
<tr><td>Forms of teaching, methods and support</td><td>Teaching in this module is primarily based on case studies to give students a practical, hands-on experience.

Students need to be prepared to be an active and well-prepared participant of the module and contribute regularly to in-class discussions!</td></tr>
<tr><td>Type of Assessment(s) and performance</td><td>

Type of Examination	Duration or Length	Performance Points	Due Date or Date of Exam
Group presentation	45 min	90	During the module
Discussion	15 min	15	During the module
Written group assignment	5 pages	15	End of the module

</td></tr>
<tr><td>Recommended Literature</td><td>Business Reports, newspaper articles, statistics, etc.</td></tr>
</table>

Module Structure	Lectures will be scheduled throughout the semester. In the module, students will prepare one presentation on a particular industry. Since a final exam at the end of the semester is not planned, individual performance and participation in group work concerning the presentation, the discussion and the written assignment will be essential for the final grade.
Usability in other Modules/Programmes	Other Electives; Master's Thesis
Last Approval Date	2020/09/14

Advanced Mergers & Aquisitions [FIN72290]

Modulkoordinator		Hirst, Simon			
Studiengang		MoF			
Studienabschnitt		Semester 4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Principles or Foundations of Finance / Bachelor Degree in Business; Intermediate level Excel Modelling skills; Familiarity with key concepts of Accounting; Either Participation in Case Studies in Investment Banking course or Mergers & Acquisitions Elective course			
Kurzbeschreibung / Lerninhalte		• Brief review of key numerical concepts of M & A and Valuation • Explanation of “Three Dimensional Analysis” and the creation of fully dynamic iterative and circular financial models in Excel, up to the advanced level used in the leading investment banks and private equity firms • Creation of a fully fledged Merger & Acquisition model in Excel with imbedded Three Dimensional Architecture for the Bidder, the Target and the Combined, using real companies as the Bidder and Target. This will be more advanced than the model used in the Mergers & Acquisitions Elective • Once the model has been explained and built, the class will form into groups of their own choosing to construct a certain part of the model themselves and input data for two entirely different companies • The Groups will work independently in some of the afternoon sessions and will be mentored by the Professor. The Class will discuss structural and financial issues to do with this example and the Groups will present their project in front of the Class for the Group Case Study Exam – this will require some deal structuring in Excel • To the extent time allows, there may also be a review of a Restructuring Model for a distressed company		

Qualifikationsziele / Lernergebnisse	*Knowledge:* Upon successful completion of this module, students will gain knowledge about the process of analyzing M&A transactions, i.e. they will: • Understand the key concepts and the mathematical relationships that drive the analysis of M&A transactions at an advanced level, combining knowledge of Business, Accounting & Finance • Understand the concept of three dimensional analysis as it relates to M&A and the construction of fully dynamic financial statements at an advanced level (for Bidder, Target and Combined) Understand how an advanced financial model is used within corporations, investment banks and private equity firms *Skills:* Upon successful completion of this module, students will be able to apply the knowledge they have gained above in the following manner: • Be able to construct three dimensional analysis with minimal supervision • Be able to complete a fully dynamic M&A model using Bidder and Target data from a blank template • Be capable of handling this analysis in relation to any industrial/consumer products company (i.e. not banks or financial institutions which have more complex regulatory parameters • Begin to be able to adapt models for any end-use with senior management *Competencies:* Upon successful completion of this module, students will have the confidence and knowledge to build very sophisticated financial models using the exact same methodology as that used by the major Wall Street investment banks and private equity houses. This should put students in an advantageous position if they want to pursue a career in investment banking, private equity, management consulting, corporate finance within a major company, or entrepreneurial activities – including the interview process.
Lernformen, Methodik und Betreuung	Lectures, in-class Excel analysis and model building performed by students (but with direct guidance from the professor), possible analytical case studies, students' presentations and mentoring of Groups by the Professor.

<table>
<tr>
<td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td>
<td>
<table>
<tr><th>Type of examination</th><th>Duration or length</th><th>Performance Points</th><th>Due date or date of exam</th></tr>
<tr><td>Group case analysis, presentation and paper</td><td>20 minutes per group</td><td>70</td><td>Last day of lecture</td></tr>
<tr><td>Individual Multiple Choice exam</td><td>30 minutes</td><td>30</td><td>Exam week</td></tr>
<tr><td>Individual Excel quiz</td><td>20 minutes</td><td>20</td><td>2nd last day</td></tr>
</table>

Details regarding the assessments will be given in first lecture
The assessments have the potential for a maximum 120 points in total
Students need to bring a laptop to every class with Excel software installed
The Group Case exam will involve groups of students evaluating a specific M&A situation and presented by them in class in a 20-minute slide presentation summarizing issues relating to the transaction, in accordance with a list of questions distributed in advance. In parallel, each group will submit their Excel model of the Case Study. This exam accounts for 70 points, with grading being based on the specific criteria which are attached.
The Individual Multiple Choice Exam is an individual test taken in Exam Week. There will be 30 questions to be answered in 30 minutes. Each question has 4 possible answers, only 1 of which is correct. Each correct answer gets 1 point, with no deductions for wrong answers. No Excel calculations will need to be made in the multiple choice, but there will be questions on specific issues relating to the use of Excel and its appropriate architecture in a financial model. A description of the structure used and the marking criteria for this exam is attached.
The Individual Excel Quiz will involve students creating a specific schedule in Excel, based upon concepts taught in class. This will take place on the second last day of classes.
A description of the structure used and the marking criteria for this exam is attached.

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<tr>
<td>Literaturhinweise</td>
<td>

Hirst, Simon: 3-D Concept Course Notes (2017)
Hirst, Simon: Model Structure Course Notes (2017)

These notes are extensive and so take the place of all other course related materials. Both documents will be distributed to all participants in advance of the course.
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<tr>
<td>Modulstruktur</td>
<td>Please see content.</td>
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</table>

Verwendbarkeit für andere Module und Programme	The elective Mergers & Acquisitions, being taught in two block weeks provides one of the possible prerequisites for this Advanced M&A elective course; Master's Thesis.
Letztes Freigabedatum	23.05.2019

Alternative Investments [FIN70620]

Modulkoordinator		Maier, Thomas; Vieira Severino, Leonardo			
Studiengang		MoF; MiM			
Studienabschnitt		Semester 4			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	44 h	Selbststudium:	106 h
Voraussetzungen für die Teilnahme		Basic knowledge of asset classes, of financial theory (e.g. CAPM) and of asset valuation techniques (e.g. DCF valuation)			
Kurzbeschreibung / Lerninhalte		1. Alternative Investments • Types of alternative investments and their characteristics • Hedge Funds • Alternative Risk Premia • Manager selection and portfolio construction • Other types of Alternative Investments • Real World Examples 2. Hedge Funds 3. Real Estate as an asset class 4. Private Equity • Overview and history (raising funds, fund organization and structure, conflicts of interest compensation) • Investment Selection (deal origination, due diligence, valuation, syndication, deal terms) • Value creation & financing (monitoring, rounds and stages, leveraging, buy and build) • Seeking liquidity & exiting (recaps, sales, IPOs, secondary markets)			

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On successful completion of this module, students will have an in-depth understanding of financial theory, alternative investments and private equity, e.g. they can:
- Explain the different types of alternative investments, such as real estate, commodities and hedge funds
- Outline the details of the “Private Equity Cycle” from raising funds to exits

Skills:
On successful completion of this module, students will have the proven ability to apply the different types of alternative investments in modern portfolio management, e.g. they can:
- Judge the relative effectiveness of different strategies in the various parts of the Private Equity and Hedge Fund Cycle
- Evaluate the trade-off of costs, risks and return of different Hedge Fund and Private Equity strategies

Competence:
On successful completion of this module, students can take responsibility to successfully transfer the learned concepts to real world situations, e.g. they can:
- Critically assess alternative investment strategies and products
- Work in an asset management position based on the fundamental theoretical background learned
- Communicate the pros and cons of different private equity and hedge funds strategies

</td></tr>
<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures, class discussion, students’ presentations</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><th>Type of examination</th><th>Duration or length</th><th>Performance Points</th><th>Due date or date of exam</th></tr>
<tr><td>Group presentation and one-pager summary</td><td>Group presentation (approx. 30 minutes) followed by Q&A (approx. 15 minutes) and/or assigned tasks</td><td>120</td><td>During the module</td></tr>
</table>

Students will organize themselves into small groups and each group will then be assigned a topic by the lecturers. The group presentations will be integrated into class and each group will have to present on a predefined date. Each student has to present a part of the topic.

</td></tr>
<tr><td>Literaturhinweise</td><td>

- "Handbook of Alternative Assets", by Mark J. P. Anson, John Wiley & Sons (2006)
- Further literature will be given during the lecture.

</td></tr>
</table>

Modulstruktur	Individual and institutional investors tend to look beyond traditional investment vehicles such as bonds, shares and investment funds. This module provides a concise overview of the most important types of private equity and alternative investments and how they affect different portfolio parameters. The starting point is a differentiation between “classic” investments vs. alternative investments and an introduction to portfolio concepts in general. The main part of the course covers all types of private equity and alternative investments and their application in modern portfolio management.
Verwendbarkeit für andere Module und Programme	Subsequent Electives, Master's Thesis
Letztes Freigabedatum	17.07.2019

Applying Artificial Intelligence in Business
[MGT71650]

Module Coordinator	Szertics, Gergely				
Programme(s)	MoF, MiM, MADS				
Term	Semester 4				
Module Duration	1 Semester				
Compulsory/Elective Module	Elective Module				
Credits:	6				
Frequency	Annually				
Language	English				
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites	No technical skills are needed for the course.				
Content	The course is giving you an overview of how artificial intelligence (AI) as a technology affects business. Some are referring to AI as similarly transformative as electricity or the internet. The course is going to walk you through the different business areas and give you insights about what technologies can be used to improve business efficiency. The course is not giving any coding skills, it only reflects the technology through metaphors. We want you to become a bridge between business needs and technology solutions, not technology architects. We are going to cover the following questions: • What is Artificial Intelligence? • How does AI learn, and why does it need so much data? • How does the AI market build up (vendors, platform providers, development frameworks) • How does AI affect different business functions? • How does AI transform the specific processes, and what use-cases are there for each segment? • Why AI is disruptive and how it affects business models? • How to identify AI opportunities in a specific business process and how to build a business case around its implementation?				

Intended Learning Outcomes	*Knowledge:* On completion of this module, you will know about the basic concepts of how artificial intelligence works and can be applied. You will be able to: • understand the key notions regarding AI (machine learning, deep learning, supervised learning, unsupervised learning, reinforcement learning) • list typical applications of different modalities of AI (image processing, voice processing, natural language processing, numerical data processing) • describe the key effects of AI to specific business processes (sales, marketing, customer service, manufacturing, supply chain management) *Skills:* On successful completion of the course you will have the ability to create materials for business decisions based on horizontal market understanding. You will be able to: • showcase AI vendors for all above business areas and describe the AI behind the service • discuss the make or buy dilemma and distinguish between off the shelf AI products, AI platforms and AI development frameworks • explain how AI learns, what data it needs and why feedback loop is important for it *Competences:* With the acquired skills and knowledge, you will achieve abilities to evaluate AI against business problems and define which technologies could be the best to address them. In the following situations you will be able to: • evaluate a specific business processes and propose specific AI based technology implementations for efficiency improvements • discuss the disruptive potential of AI in key industries (retail, manufacturing, healthcare) • construct a map of AI opportunities for a specific organization and estimate business impact • elaborate and pitch business suggestions to a board about AI investments
Forms of teaching, methods and support	The basic teaching form will be lectures with a lot of integrated case studies.

Type of Assessment(s) and performance

Type of examination	Duration or length	Performance Points	Due date or date of exam
Class preparation / participation		30	Continuous
Exam for key concepts	30 minutes	30	The beginning of the 9th module
Pitch competition	3 hours	30	11th module
Elaboration of a map of opportunities for a use case	Homework	30	2 weeks after the end of course

Class preparation / participation
There are going to be group task for understanding use-cases, collecting ideas to use AI-based technologies to different functions and industries where you will be able to show how creatively and reasonably you can apply the principles of solving business problems with AI in specific cases.

Exam for key concepts
Understanding the most important concepts of AI is critical to being able to apply the technology in business. We are going to spend the first 4 modules on understanding these notions, show how they are implemented in different business scenarios in modules 5-8 and start the 9th module with a short exam.

Pitch competition
At the end of the course, teams are going to be given a corporate challenge: what AI tools could be used and how they could be beneficial in a specific corporate situation. Teams are going to have to elaborate key opportunities, rate them in complexity and business value and create a 5-minute presentation in highlighting the best potentials and AI related suggestions to the “board” of the company. The criteria used to judge performance include:

- Questions asked during the preparation phase from the board
- Understanding the complexity and addressing it with thorough solutions
- Business feasibility and technological validity of the ideas
- Quality of the final presentation

Creating a map of opportunities
After the end of the course, you will get a written corporate challenge to elaborate a written map of AI opportunities for the company. You will have to understand the related business processes, and look for relevant similar analogies of use-cases, or come up with internally executable development ideas. You will have two weeks to give a written proposal for a specific corporate situation with ranked opportunities.

Recommended Literature	• Ajay Agrawal, Joshua, Avi Goldfarb: Prediction machines: The Simple Economics of Artificial Intelligence, 2018 • McKinsey Global Institute, Artificial intelligence the next digital frontier?, 2017
Module Structure	The first 4 sessions are going to give an overview about how artificial intelligence works as a technology to be able to understand the foundations of machine learning in different data sources (numeric, visual, audio, language). In modules 5-8 we are going to focus on different business processes and how AI is transforming the way we automate and augment these areas. In sessions 9-10 we turn our attention to the risks and difficulties of choosing and implementing these technologies and we finish the course with a pitch competition. The more detailed breakdown of the structure is as follows: 1. Introduction to AI – history, and relationship to other technologies 2. What is “learning” – understanding machine learning through the analogies of human thinking 3. Patterns in numbers and voice 4. Natural language processing and image recognition 5. Applications in sales and marketing 6. Applications in customer service 7. Applications in manufacturing and supply chain management 8. Applications in supporting functions (HR, legal, finance) 9. The make or buy dilemma: estimating complexity and business value 10. The organizational competencies needed to integrate AI-based technologies 11. Pitch competition
Usability in other Modules/Programmes	Other electives, Master?s Thesis
Last Approval Date	2018/10/22

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Intercultural Management

<table>
<tr><td colspan="3">Module Coordinator</td><td colspan="2">Moshtagh Khorasani</td></tr>
<tr><td colspan="3">Programme(s)</td><td colspan="2">Master in Management</td></tr>
<tr><td colspan="3">Term</td><td colspan="2">Semester 3</td></tr>
<tr><td colspan="3">Module Duration</td><td colspan="2">One semester</td></tr>
<tr><td colspan="3">Compulsory/ Elective Module</td><td colspan="2">Concentration Module</td></tr>
<tr><td colspan="3">Credits</td><td colspan="2">6 ECTS</td></tr>
<tr><td colspan="3">Frequency</td><td colspan="2">Annually</td></tr>
<tr><td colspan="3">Language of Instruction</td><td colspan="2">English</td></tr>
<tr><td>Total Workload</td><td>150</td><td>Contact hours</td><td>44</td><td>Independent Learning 106</td></tr>
<tr><td colspan="3">Prerequisites</td><td colspan="2"></td></tr>
<tr><td colspan="3">Content</td><td colspan="2">1) Definition of culture and communication (cultural diversity)
2) Regulators of human life (religion, nation, class, gender, race, civilization)
3) Cultural dimensions (models of Hofstede, Trompenaars and Hampton-Turner, Hall)
4) Barriers to Intercultural Communication (anxiety, assuming similarity instead of difference, ethnocentrism, stereotypes and prejudice, nonverbal misinterpretations and language)
5) Comparative Cultural Patterns (USA, China, Middle East, Russia, etc.) Future challenges
6) Immigration and Acculturation (Europe)
7) Cultures Within Cultures: Identity and Subgroups
8) Contact Between Cultures Business Oriented</td></tr>
<tr><td colspan="3">Intended Learning Outcomes</td><td colspan="2"></td></tr>
<tr><td colspan="3">Forms of teaching, methods and support</td><td colspan="2">Lecture, case studies, group discussion</td></tr>
<tr><td colspan="3">Type of Assessment(s) and performance points</td><td colspan="2"><table><tr><td>Type of Assessment</td><td>Duration</td><td>Performance Points</td><td>Due Date</td></tr><tr><td>a) Written exam</td><td>3 hours</td><td>80 points</td><td></td></tr><tr><td>b) Group Presentation</td><td>20 mins</td><td>40 points</td><td></td></tr></table></td></tr>
<tr><td colspan="3">Recommended Literature</td><td colspan="2">- Barna, L. M. (1997). Stumbling blocks in intercultural communication. In Samovar, L. A., &Porter, R. E., (1997). Intercultural communication (eighth ed). Belmont, ca: Wadsworth Publishing.</td></tr>
</table>

	- **Chaney, L.; Martin, J.** (2014): Intercultural Business Communication. Boston. Pearson. - **Hall, E.** (1992). Understanding cultural differences. Yarmouth, Intercultural Press. - **Hall, E.** (1989). Beyond Culture. Anchor Books. - **Harris, P.; Moran, R.** (2004): Managing cultural differences leadership strategies for a new world of business. 5th edition. Woburn, MA, Butterworth-Heinemann. - **Hofstede, G. (1980):** Culture's Consequences: International Differences in Work-Related Values. Beverly Hills: Sage Publications. **Hofstede, G.** (1983): Dimensions of National Culture in Fifty Countries and Three Regions. In: Deregowski, J.B., Dziurawiec, S. and Annis, R.C. (Eds), Expiscations in Cross-Cultural Psychology, 335-355. Lisse: Swets & Zeitlinger. - Hofstede, G. (1986): Cultural Differences in Teaching and Learning. In: International Journal of Intercultural Relations, 10, 301-320. **- Hofstede, G.** (1991): Cultures and Organizations: Software ofthe Mind. London: McGraw Hill. **- Hofstede, G.** (1994): The Business of International Business is Culture. In: Interna tional Business Review, 3(1), 1-14. - **Hofstede, G.; Hofstede, G. J.; Minkov, M.** (2010): Cultures and organizations. Software of the mind ; intercultural cooperation and its importance for survival. Rev. and expanded 3. ed. New York: McGraw-Hill. - **House, R.J., Hanges, P.J., Javidan, M., Dorfman, P. W., & Gupta, V.** (2004). *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies*, copyright. - **Jandt, Fred E.** (2015). *An Introduction to Intercultural Communication Identities in a Global Community*, Eighth Edition, Sage Publications UK. **- Kopper, E.** (2003): Multicultural Teams. In Bergemann, N.; Sourisseaux, A. (Hrsg.): Interkulturelles Management. 3. Aufl. (S. 363–368). Berlin: Springer. **- Moll, M.** (2012): The Quintessence of Intercultural Business Communication. Berlin, Heidelberg: Springer. - **Silverthorne, C. P. (**2005): Organizational psychology in cross-cultural perspective. New York, N.Y: New York University Press. **- Trompenaars, F.** (1997): Riding the Waves of Culture. Understanding Cultural Diversity in Business. 2nd ed. London. Brealey. **- Trompenaars, F.** (2004): Managing people across cultures.

	Chichester. Capstone.
Module Structure	
Usability in other modules / programs	- Leadership studies - Organizational science - International business
Last Approval Date	*Approval Date by Programme Director and publishing date by programme assistant.*

Organisational Design [MGT73781]

Modulkoordinator		Billinger, Stephan			
Studiengang		MSc MiM			
Studienabschnitt		4 Semester			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahlpflicht			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	37 Academic Hours	Selbststudium:	122 h
Voraussetzungen für die Teilnahme		Business Economics; Strategic Management			
Kurzbeschreibung / Lerninhalte		The module Organisational Design introduces key principles and methods used for designing effective organisations. It focuses in tradeoffs associated with the design and adaptation of cooperation and coordination in teams, departments, business units, and large corporations. The module builds on economic and behavioural perspectives and introduces classic as well as contemporary approaches to organisation design. The module combines case analyses, conceptual and problem-driven discussions, as well as teaching simulations, in order to offer a compelling introduction to managerial challenges in organisational design.			

<table>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>

Knowledge:
On successful completion of this module, students will have a thorough comprehension of principal concepts and theories in organisational design, i.e. they can:
- Describe the key trade-offs that occur when designing organisations
- Outline how organisation design influences differentiation and integration
- Explain how organisation design affects the motivation of organisational members

Skills:
On successful completion of this module, students will have the proven ability to apply principal knowledge in organisational design and to solve managerial problems, i.e. they can:
- Analyse how the organisational design aligns with the strategy and balances routine and innovation
- Derive organisational design criteria from a strategy
- Diagnose organisational shortcomings
- Develop and evaluate alternative organisational designs

Competencies:
On successful completion of this module, students can take responsibility to improve organisational performance, i.e. they can:
- Design interventions to improve organisational performance
- Design an effective organisation within its market niche and review its business performance for sustainability
- Capture and document the organisational design and performance assessment to support the agility for change of organisations
- Discuss trade-offs in organisational design

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<tr><td>Lernformen, Methodik und Betreuung</td><td>Lectures, classroom discussion, case studies, classroom experiments and teaching simulations.
Lectures will be scheduled in blocks. A high degree of student involvement is expected.</td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>

<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Class participation</td><td>Throughout the module</td><td>30</td><td>During the module</td></tr>
<tr><td>Group project</td><td>TBA</td><td>40</td><td>During the module</td></tr>
<tr><td>Take-home exam</td><td>TBA</td><td>50</td><td>During the module</td></tr>
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Literaturhinweise	Gareth R. Jones, Organizational Theory, Design, and Change, 7th edition, Pearson 2013 Phanish Puranam, Bart Vanneste, Corporate Strategy: Tools for Analysis and Decision-Making, Cambridge University Press, 2016. James G. March, A Primer on Decision-Making: How Decisions Happen. The Free Press 1994 Robert Grant, Contemporary Strategy Analysis (combined text and cases), John Wiley & Sons, Inc., 9th edition, 2016
Modulstruktur	1. Organisation Design a. On the Nature of Organisation b. Organisation Design and Archetypes 2. Macro-level Organisation Design a. Corporate Strategy and Business Strategy b. The Corporate Headquarters and Value Chain Design 3. Micro-level Organisation Design a. Specialization and Coordination b. Authority, Delegation and Control 4. Organisation Design: Latest trends a. Teaching simulation b. New forms of organisation 5. Organisational Culture and Change a. Creating and Managing Organisational Culture b. Types and Forms of Organisational Change c. Competencies and Technology adoption d. Innovation and Ambidexterity 6. Case Presentations 7. Course Summary
Verwendbarkeit für andere Module und Programme	Master's Thesis
Letztes Freigabedatum	04.08.2020

Sustainability and Ethics in Digital Transformation [MGT63437]

Modulkoordinator		Mick, Thomas			
Studiengang		MiM; MoF; MADS			
Studienabschnitt		4. Semester			
Moduldauer		1 Semester			
Pflicht-/Wahlpflichtmodul		Wahl			
Credits:		6			
Häufigkeit des Angebots		Jährlich			
Sprache		Englisch			
Workload:	150 h	Präsenz:	37 Academic Hours	Selbststudium:	122 h
Voraussetzungen für die Teilnahme		-			

Kurzbeschreibung / Lerninhalte	Welcome to the Future This module aims to provide a **holistic view** to the students to understand the global **digital ecosystem** in which we are operating nowadays and give them a perspective to **question current structures** as well as the tools to successfully understand and manage the role of companies as a driver for future innovation for our society in a sustainable and ethical way. Global Perspectives For the last 20 years our everyday life is becoming more and more influenced by technologies and products from the **digital realm** at an increasing rate of speed, creating a new renaissance in our world. Nowadays drivers are digital platforms concentrated in the US and China, forcing traditional companies to adapt quickly while major stakeholders from the corporate side like startups and their incubators and accelerators, fostered by investors, single nations and institutions like the European Commission, create value at an exponentially growing rate. Due to this increasing speed of development it is becoming more and more important to address upcoming **ethical questions** as well as facts about **sustainable development** framed by the Sustainable Development goals (SDGs) of the UN in 2015. Future Foundations Usually the implementation of digital technologies, that are implemented in companies as a driver for future development, aim to increase efficiency and effectiveness of the existing business landscape alone. It becomes more and more clear that this is **not enough** as these initiatives are not an enabler to close the gap between the existing business models and future demands. Instead, modern digital technologies have to be understood as **driver for future business value creation** taking into account all stakeholders involved. They must be our tools to evolve far beyond the current market as we understand it today. Local Implementation The idea of fostering the understanding of living in a knowledge society is becoming more and more obsolete. Knowledge becomes more and more accessible to people and gets outdated every faster. Driven by the understanding of creating business value by increasing

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<tr><td></td><td>efficiency and effectiveness, nowadays jobs are becoming more and more narrow regarding the different types of tasks and challenges that need to be tackled by a single person in todays organizations.

To be able to navigate successfully towards the future and implement according business models, we need tools to see current situations from a holistic perspective to change ourselves to an innovation society as soon as possible.</td></tr>
<tr><td>Qualifikationsziele / Lernergebnisse</td><td>On successful completion of this module, students will have a thorough comprehension of the digital transformation, i.e. they
• know the major stakeholders of the global digital ecosystem and their interfaces
• understand the crucial role of ethics and sustainability in the process of digitalisation and can apply their principles to it
• understand and can apply technological concepts like Big Data, Artificial Intelligence, Machine Learning and Blockchain
• understand corporate structures as they exists nowadays and know different approaches for future developments
• know the concepts of System Thinking and can apply them to create holistic solutions
• understand the crucial role of Innovation and Change Management and how to apply them
• are able to develop digital solutions for future markets that are ethical and sustainable</td></tr>
<tr><td>Lernformen, Methodik und Betreuung</td><td></td></tr>
<tr><td>Art der Prüfungsleistungen im Modul und Akkumulationspunkte</td><td>
<table>
<tr><td>Type of examination</td><td>Duration or length</td><td>Performance Points</td><td>Due date or date of exam</td></tr>
<tr><td>Intreactive assignments</td><td>One session</td><td>40</td><td>In-class</td></tr>
<tr><td>Digital Transformation Project</td><td>In-class</td><td>40</td><td>In-class</td></tr>
<tr><td>Final exam</td><td>50 min.</td><td>40</td><td>Exam week</td></tr>
</table>
</td></tr>
<tr><td>Literaturhinweise</td><td>Provided material during lecture.</td></tr>
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Modulstruktur	Session Topic 1.1 Digitalization as the new industrial revolution 1.2 Individuals and Society 1.3 Ethics and Sustainability 1.4 Major stakeholders of the global ecosystem 2.1 Big Data 2.2 Artificial Intelligence 2.3 Machine learning 2.4 Blockchain 3.1 Corporate and Organizational structures 3.2 Innovation and Change Management 4.0 Digital Transformation Project
Verwendbarkeit für andere Module und Programme	-
Letztes Freigabedatum	31.08.2020