

Master Programme Course Selection

Quarter Schedules

Quarter 1:	Academic period:	31 August – 24 October 2020
	Exam Week:	26 October – 31 October 2020
Quarter 2:	Academic period:	02 November – 12 December 2020
	Exam Week:	14 December – 19 December 2020

Core Courses

Q1		Q2	
Algorithms & Data Structures	MADS	Accounting	MiM
Business Statistics	MiM	AI & Humanity – Ethics of Data Science	MADS
Evidence Based & Responsible Management	MiM	Business Economics	MiM
Finance	MiM	Corporate Finance	MoF
Financial Statement Analysis	MoF	Macro & Monetary Economics	MoF
Foundations of Finance	MoF	Machine Learning I	MADS
Intro to Data Analytics in Business	MADS	Machine Learning II	MADS
Managing & Storing Big Data	MADS	Visualising Big Data	MADS
Marketing	MiM		
Quantitative Fundamentals	MADS		
Statistics & Econometrics	MoF		

Concentration Courses

Q1		Q2	
Consumer Behaviour	MiM	Advisory Project	MoF
Corporate Valuation	MoF	Case Studies in Investment Banking	MoF
Debt Finance	MoF	Equity Finance	MoF
Derivatives Analysis	MoF	M&A Accounting	MoF
Derivatives for Corporate Finance	MoF	Marketing Analytics	MiM
Equity Finance	MoF	Operations Strategy	MiM
Financial Information & Decision-Making	MoF	Prescriptive Analytics	MiM
Marketing Strategy	MiM	Resource Allocation Strategy	MiM
Predictive Analytics	MiM	Risk Modelling	MoF
Restructuring & Strategic Management Control	MoF	Strategic Management Control	MiM
Risk Governance & Organisation	MoF		
Scaling Digital Businesses	MiM		
Supply Chain Strategy	MiM		

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

Algorithms & Data Structures [QUM71120]

Module Coordinator		Andonians Salmas, Vahe			
Programme(s)		Master in Applied Data Science			
Term		-			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Students need a laptop with Python 3 installed.			
Content		<p>Algorithms and data structures are inherently related and build together the foundations of computer programming. Especially, with the rise of Big Data, efficient algorithms and matching ways of storing data are not just creating better code but are a necessity.</p> <p>Using Python, this course provides an introduction into basic algorithms, as well as the design and analysis of algorithms. Alongside algorithms data matching structures are introduced.</p> <p>Over the last couple of years Python has emerged as the standard programming language of data scientists due to its simple syntax and huge ecosystem. In this course we will use Python to implement taught algorithms and hence learn the basics of that popular programming language.</p> <p>Due to the focus on data science, two of the most famous packages, Pandas and NumPy, are also introduced</p>			

<p>Intended Learning Outcomes</p>	<p><i>Knowledge:</i> By the time students finish the course, they should have a basic understanding of computer algorithms and data structures which together build the foundation of software engineering. Students will also acquire knowledge about the programming language Python.</p> <p><i>Skills:</i> Students will be able to design and analyze basic computational algorithms in pseudo code and further implement them in Python.</p> <p><i>Competence:</i> On successful completion of this module, students will have proven theoretical and practical understanding of the software engineering foundation. They will be able to solve an unknown problem theoretically using algorithms.</p>																
<p>Forms of teaching, methods and support</p>	<p>Lecture and implementation in class.</p>																
<p>Type of Assessment(s) and performance</p>	<table border="1"> <thead> <tr> <th>Type of Assessment</th> <th>Duration</th> <th>Performance Points</th> <th>Due Date or Exam Date</th> </tr> </thead> <tbody> <tr> <td>Class participation</td> <td>During the course</td> <td>48</td> <td></td> </tr> <tr> <td>Group projects</td> <td>During the course</td> <td>24</td> <td></td> </tr> <tr> <td>Written exam</td> <td>Two hours</td> <td>48</td> <td>End of the course</td> </tr> </tbody> </table>	Type of Assessment	Duration	Performance Points	Due Date or Exam Date	Class participation	During the course	48		Group projects	During the course	24		Written exam	Two hours	48	End of the course
Type of Assessment	Duration	Performance Points	Due Date or Exam Date														
Class participation	During the course	48															
Group projects	During the course	24															
Written exam	Two hours	48	End of the course														
<p>Recommended Literature</p>	<p>An epub will be provided after each session.</p> <p>(Optionally) Introduction to Algorithms, 3rd Edition (The MIT Press) Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein The MIT Press; 3rd edition (July 31, 20019)</p>																

Module Structure	<ul style="list-style-type: none"> • Introduction to algorithms • Introduction to Python <ul style="list-style-type: none"> • Expressions • Variables • Conditions • Iterations • Analyzing algorithms • Functions, scoping, and abstraction in Python <ul style="list-style-type: none"> • Functions and scoping • Global Variables • Files • Modules • Introduction to git • Sorting <ul style="list-style-type: none"> • Merge Sort • Quicksort • Elementary data structures <ul style="list-style-type: none"> • Stacks and queues • Linked lists • Hash tables • Binary search trees • Structured types in Python <ul style="list-style-type: none"> • Tuples • Dictionaries • Classes • Functions as objects • Introduction to NumPy • Introduction to Pandas
Usability in other Modules/Programmes	-
Last Approval Date	2019/09/06

Business Statistics [QUM71410]

Module Coordinator		Bleier, Alexander; Witkowski, Jens			
Programme(s)		MSc MiM			
Term		Semester 1 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Understanding of basic mathematical concepts (basic calculus, algebra, and probability).			
Content		<p>In today's rapidly moving business world, data and its inherent value gain more and more importance. While the sheer amount, complexity, and frequency of data evolve at unprecedented speeds, so do the statistical methods available for its analysis. The primary goal of this course is therefore to equip students with the necessary statistical foundation to navigate their future roles as managers that base decisions on solid data and analyses. To achieve this goal, the course will introduce students to relevant vocabulary as well as statistical concepts and tools, drawing on descriptive and inferential statistics. In essence, the course will focus on ways to assess, comprehend, and exploit data to produce well-informed business decisions.</p>			

Intended Learning Outcomes	<p><i>Knowledge:</i> Successfully completing this course will enable students to comfortably navigate fundamental statistical concepts and their application in business. In particular, they will be able to</p> <ul style="list-style-type: none"> • assess and evaluate outcomes of statistical analyses • describe the strengths and weaknesses of relevant procedures • explain the value of data and exploit it to inform business decisions <p><i>Skills:</i> Upon successful completion of this course, students will know how to apply statistical tools and concepts to identify and extract potential gains from available data. In particular, they will be able to</p> <ul style="list-style-type: none"> • collect, access, and structure data • select adequate statistical methods in particular business situations • derive reasonable business decisions based on appropriate statistical analyses <p><i>Competencies:</i> Having successfully completed this course, students will be capable of assessing, structuring, and solving statistical problems based on their analytical and logical problem solving capacities. In particular, they will be able to</p> <ul style="list-style-type: none"> • handle, assess, and analyze data sets • develop and organize concepts and projects with a focus on data analysis • derive and defend business decisions based on their statistical knowledge and reasoning
Forms of teaching, methods and support	This course may contain traditional lecturing, discussions, projects, homework, team work, applications.
Type of Assessment(s) and performance	-
Recommended Literature	Introductory statistical and data science literature (also recommended as pre-reading), e.g. <ul style="list-style-type: none"> • Bruce L. Bowerman, Richard T. O'Connell, and Emily S. Murphree, Business Statistics in Practice - Using Data, Modeling, and Analytics, McGraw-Hill, 2017 • Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani, An Introduction to Statistical Learning - with Applications in R, Springer, 2017 • Alan Anderson, Business statistics for dummies, Wiley, 2013 • Deborah J. Rumsey, Statistics for dummies, Wiley, 2016 • Deborah J. Rumsey, Statistics Essentials for dummies, Wiley, 2010 • Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle, Quantitative Methods for Investment Analysis, Second Edition, CFA Institute

Module Structure	This course is structured into two parts: the first part comprises an introduction to basic statistical techniques that help managers make decisions based on available data. The second part builds on this knowledge and focuses on making predictions from data.
Usability in other Modules/Programmes	Subsequent modules of the programme, Master's Thesis.
Last Approval Date	2019/06/14

**Evidence-based & Responsible Management
[MGT71581]**

Module Coordinator		Kremer, Mirko			
Programme(s)		Master in Management			
Term		3. Semester/Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Business Statistics			
Content		<p>Our world has become increasingly data-driven. While intuition and isolated anecdotes remain an integral part of leadership and managerial decision-making, the rapidly increasing availability of (big) data and technologies has fostered a strong push towards evidence-based decision-making in practice. As a result, a successful career in consulting or management requires substantive knowledge and skills in a variety of empirical research methods to make evidence-based decisions that have merit. Thus, students in management need to develop strong competencies as creators, recipients, and applicants of scientific studies.</p> <p>This course focuses on the design and implementation of high- quality empirical studies in the areas of management. The course serves a dual purpose:</p> <ol style="list-style-type: none"> 1) The immediate goal is to provide students with the methodological toolkit for their MSc theses. 2) The overarching goal is to prepare students for increasingly “evidence-driven” (i.e., scientific) decision making in management and consulting practice. 			

<p>Intended Learning Outcomes</p>	<p>The course introduces principles and tools designed to understand the utility of evidence-based management, and its relevance for managerial decision-making.</p> <p>Knowledge Students will acquire fundamental knowledge of the key concepts of evidence-based management, i.e. they can</p> <ul style="list-style-type: none"> • read and understand scientific literature, • identify and select the appropriate qualitative or quantitative methods to answer specific research questions, • point out potential ethical problems of various research designs, • evaluate and apply scientific knowledge to solve business problems, • structure and write research reports. <p>Skills Students will be able to apply a variety of research methods to business research problems and draw conclusions from the results, i.e. they can</p> <ul style="list-style-type: none"> • create a research proposal, • develop strategies on how to obtain data, • assess ethical pitfalls of research methods, • critically evaluate various types of research designs. <p>Competencies In a business environment students will be able to apply the skills and knowledge, i.e. they can</p> <ul style="list-style-type: none"> • define a relevant research question, • select a method for answering it, • draw the appropriate conclusions from the results, • act responsibly while implementing management practices or making managerial decisions. 																
<p>Forms of teaching, methods and support</p>	<p>The course is taught interactively. A variety of exercises and discussion questions are used to train participants. Participants are expected to cover the course contents by preparation, follow-up work, and self-study.</p>																
<p>Type of Assessment(s) and performance</p>	<table border="1"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance Points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td>Research proposal</td> <td>tbd</td> <td>80</td> <td>tbd</td> </tr> <tr> <td>Class participation</td> <td></td> <td>20</td> <td>During the module</td> </tr> <tr> <td>Quizzes</td> <td></td> <td>20</td> <td>During the module</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Research proposal	tbd	80	tbd	Class participation		20	During the module	Quizzes		20	During the module
Type of examination	Duration or length	Performance Points	Due date or date of exam														
Research proposal	tbd	80	tbd														
Class participation		20	During the module														
Quizzes		20	During the module														

Recommended Literature	<p><u>General readings</u></p> <ul style="list-style-type: none"> • Cooper, D. R., Schindler, P. S., & Sun, J. (2006). Business research methods (Vol. 9). New York: McGraw-Hill Irwin. • Rousseau, D. M. (2006). Is there such a thing as “evidence-based management”? <i>Academy of Management Review</i>, 31, 256-269. • Pfeffer, J., & Sutton, R. I. (2006). Evidence-based management. <i>Harvard Business Review</i>, 84, 62-72. <p><u>Additional readings</u></p> <p>Students will be required to read additional literature for most class sessions. These readings will be made available prior to the specific sessions.</p>
Module Structure	<p>Sessions 1-3 introduce the fundamentals of the scientific method. The module focusses on important steps that need to be taken before collecting and analyzing data. These steps include research design, construct measurement, and sampling. We also cover ethical boundaries for evidence- based management.</p> <ol style="list-style-type: none"> 1. Basics of Empirical Research 2. Basics of Empirical Research 3. Sampling, target populations and Participants <p>Sessions 4-11 cover the main methods for collecting high- quality data to rigorously test research questions (or explore new ones).</p> <ol style="list-style-type: none"> 4. Survey Research 5. Survey Research 6. Experimental Research 7. Experimental Research 8. Case Research 9. Case Research 10. Interpretative Research 11. Interpretative Research <p>A more detailed break-down will follow at the beginning of the course.</p>
Usability in other Modules/Programmes	Master?s Thesis
Last Approval Date	2020/05/08

Finance [FIN72013]

Module Coordinator		Sangiorgi, Francesco			
Programme(s)		MSc MiM			
Term		Semester 1 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Basic knowledge in management concepts from the Bachelor studies			
Content		<p>The module will cover the following topics:</p> <p>Part I: Asset markets</p> <ul style="list-style-type: none"> • The present value (PV) rule • Fixed-income securities • Stock valuation and market efficiency • Introduction to financial derivatives <p>Part II: Corporate finance</p> <ul style="list-style-type: none"> • Capital budgeting • Financial structure decisions in the presence of taxes and bankruptcy costs • Incentives and information issues • Pay-out policies 			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of i) the functioning of asset markets and the fundamental tools of asset valuation, and ii) the analysis of the main capital structure and investment decisions made by corporations. They will be able to:</p> <ul style="list-style-type: none"> • Explain the nature and role of different financial markets • Describe the importance of risk and return in financial decision making • Discuss the impact of financial market frictions on the financing decisions of firms <p><i>Skills:</i> On successful completion of this module, students will acquire the theoretical foundations and analytical tools necessary for financial decision making and valuation, i.e. they can:</p> <ul style="list-style-type: none"> • Apply key financial concepts to value financial securities • Implement valuation techniques for capital budgeting purposes • Evaluate the impact of financing decisions on firm value <p><i>Competence:</i> On successful completion of this module, students will understand the key concepts of modern asset pricing and corporate finance theory and will be able to apply them to practice. In particular, they can:</p> <ul style="list-style-type: none"> • Apply asset pricing and corporate finance theory to solve problems that investors and firms typically face • Synthesize and critically evaluate information for sound financial decision making • Analyse and interpret data correctly to select value-enhancing projects
Forms of teaching, methods and support	Lectures and problem sets, tutorials
Type of Assessment(s) and performance	-
Recommended Literature	<ul style="list-style-type: none"> • Berk and DeMarzo, 2016, Corporate Finance, Pearson International Edition. • Brealey, Myers, and Allen, 2011, Principles of Corporate Finance, 10th ed., McGraw-Hill • Bodie, Kane and Marcus, Investments, 2014, 10th ed., McGraw-Hill
Module Structure	11 classes including lectures and problem set corrections, plus additional tutorials with the teaching assistant of the course
Usability in other Modules/Programmes	Other Finance modules
Last Approval Date	2019/06/28

Financial Statement Analysis [ACC71010]

Module Coordinator		Zhang, Ning			
Programme(s)		MSc MF			
Term		Semester 1 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		None			
Content		<ol style="list-style-type: none"> 1. Bookkeeping Essentials 2. Foundations of Accrual Accounting 3. Reading Financial Statements 4. Accounting for Revenues & Working Capital 5. Accounting for Non-Current Assets 6. Accounting for Risk 7. Accounting Quality 8. Profitability and Working Capital Analysis 9. Risk Analysis 10. Credit Analysis 			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of the major concepts, approaches and techniques useful for financial accounting and financial statement analysis, i.e. they can:</p> <ul style="list-style-type: none"> • Explain how complex business transactions are recorded in financial statements • Illustrate how the recognition of complex business transactions impacts financial ratios • Compare how different stakeholder groups make use of financial accounting information <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply their theoretical and applied accounting knowledge and the analytical toolkit to typical decision problems in which financial information is used, i.e. they can:</p> <ul style="list-style-type: none"> • Assess the financial consequences of entering certain transactions • Adjust and extrapolate financial statements to let them articulate • Analyze financial statements for rating and valuation purposes <p><i>Competence:</i> On successful completion of this module, students can take responsibility to transfer these concepts to typical decision situations in finance and management such as</p> <ul style="list-style-type: none"> • Influencing decision making by designing tools and processes for rating and investment decisions • Synthesizing accounting practices with business transaction design • Identifying reporting incentives and challenging assumptions about accounting quality
Forms of teaching, methods and support	<ul style="list-style-type: none"> • Lecture • Discussion • Exercises • Case studies
Type of Assessment(s) and performance	-

Recommended Literature	<p><u>Course material:</u></p> <p>Slides will be provided to accompany the lecture. Other course material of a more preparatory nature (readings, cases, case inputs files, etc.) will be posted to the course website prior to class.</p> <p>Additional literature: We recommend the following textbook to students who want to gain in-depth insights into GAAP and IFRS:</p> <ul style="list-style-type: none"> • Picker et al.: Applying IFRS Standards. 4th ed. John Wiley & Sons 2016 • Weil, Schipper, and Francis, Financial Accounting: An Introduction to Concepts, Methods and Uses, South-Western College Publishing, 2012 • Stephen H. Penman, Financial Statement Analysis and Security Valuation (Fifth edition), McGraw Hill.
Module Structure	Part I: Financial statements preparation Part II: Financial statements analyses
Usability in other Modules/Programmes	Subsequent modules
Last Approval Date	2019/09/03

Foundations of Finance [FIN71010]

Module Coordinator		Steffen, Sascha; Sangiorgi, Francesco			
Programme(s)		MSc MF			
Term		Semester 1 Q1			
Module Duration		-			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		None			
Content		<p>This course is intended to provide a market-oriented framework for analysing the major types of financial decisions made by corporations. Lectures and readings will provide an introduction to present value techniques, capital budgeting principles and problems, asset valuation, the operation and efficiency of financial markets, and the financial decisions of firms. Throughout the class, we will solve problems to enhance our understanding of the covered topics. All conceptual issues are brought together through the discussion of two cases.</p> <p>Topics:</p> <ul style="list-style-type: none"> • NPV Rule • Interest rates and investment decisions rules • Valuation of bonds and stocks • Measuring risk, mean-variance analysis, diversification and beta • CAPM and capital budgeting techniques • Market efficiency • Capital structure • Payout policy • Investment and financing decisions • Risk management and the pricing of derivatives 			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of i) the functioning of asset markets and the fundamental tools of asset valuation, and ii) the analysis of the main capital structure and investment decisions made by corporations. They will be able to:</p> <ul style="list-style-type: none"> • Explain the nature and role of different financial markets • Describe the importance of risk and return in financial decision making • Discuss the impact of financial market frictions on the financing decisions of firms <p><i>Skills:</i> On successful completion of this module, students will acquire the theoretical foundations and analytical tools necessary for financial decision making and valuation, i.e. they can:</p> <ul style="list-style-type: none"> • Apply key financial concepts to value financial securities • Implement valuation techniques for capital budgeting purposes • Evaluate the impact of financing decisions on firm value <p><i>Competence:</i> On successful completion of this module, students will understand the key concepts of modern asset pricing and corporate finance theory and will be able to apply them to practice. In particular, they can:</p> <ul style="list-style-type: none"> • Apply asset pricing and corporate finance theory to solve problems that investors and firms typically face • Synthesize and critically evaluate information for sound financial decision making • Analyze and interpret data correctly to select value-enhancing projects
Forms of teaching, methods and support	Lectures and problem sets
Type of Assessment(s) and performance	-
Recommended Literature	<ul style="list-style-type: none"> • Berk and DeMarzo, Corporate Finance, 3rd ed., Pearson <p>Those of you with a limited exposure to finance may also find the following additional text useful:</p> <ul style="list-style-type: none"> • Downes, John, and Jordan Elliot Goodman, <i>Barron's Financial Guides: Dictionary of Finance and Investment Terms</i>, 9th edition (Barron's Educational Series, 2014)
Module Structure	11 classes including lectures and problem sets corrections, plus additional tutorials with the teaching assistant of the course.
Usability in other Modules/Programmes	Other Finance modules
Last Approval Date	2019/06/19

**Intro to Data Analytics in Business
[INF71110]**

Module Coordinator		Roßbach, Peter			
Programme(s)		Master in Applied Data Science			
Term		-			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Knowledge in Probability Theory and Statistics; Knowledge in Python including NumPy and Pandas			
Content		<p>Data Analytics (or Data Science) is an emerging field in industry and academics. It covers methodologies, algorithms, and processes to tackle the challenges in times of big data, where we are confronted with large amounts of high-dimensional data of different types. While the classical statistical approach has some weaknesses in this context, new ways and methods of data analysis have been established under the term machine learning. Today, they are widely used in science and practice benefitting from calculation power of modern computer technologies.</p> <p>This course provides an introduction into the field of Data Analytics, covering computational techniques and algorithms for finding and analyzing patterns even in large-scale datasets. Topics to be covered include data preparation, integration, analysis, visualization, segmentation, classification, prediction and decision making. Students will implement and apply the methods using the programming language Python and the related libraries.</p>			

<p>Intended Learning Outcomes</p>	<p>Knowledge: Students will acquire a comprehensive understanding of the challenges of data analysis in times of big data and learn how to apply modern methods of data analytics to different application areas, i.e. they can:</p> <ul style="list-style-type: none"> • Explain the specifics of data analysis in the case of big data • Explain the differences between statistics and machine learning • <i>Apply modern methods of data analytics to different application areas</i> <p>Skills: Students learn to analyze data, choose the appropriate modeling techniques and to construct models for decision support. They also learn how to implement the data analytics processes using Python as a modern analytical language. They are able to:</p> <ul style="list-style-type: none"> • Choose the appropriate methods according to the problem to solve • Develop the analytics processes via different data analytics tools • Train and tune the models to achieve the optimal results • <i>Analyze the resulting models to find the best solution</i> <p>Competence: Students are qualified to find and analyze patterns in data and to transform the gained knowledge into managerial decisions. They acquire a fundamental background to fulfill the demands of a modern data scientist. They are able to:</p> <ul style="list-style-type: none"> • Understand the underlying business problems • Identify the problem relevant data • Build quantitative models to solve the problem choosing from a variety of methods • Transform the models results into managerial decisions 								
<p>Forms of teaching, methods and support</p>	<p>Lecture with in-class and home exercises using Python and Scikit-learn.</p>								
<p>Type of Assessment(s) and performance</p>	<table border="1"> <thead> <tr> <th data-bbox="480 1451 699 1525">Type of Assessment</th> <th data-bbox="699 1451 935 1525">Duration/ length</th> <th data-bbox="935 1451 1155 1525">Performance Points</th> <th data-bbox="1155 1451 1375 1525">Date/ Due Date</th> </tr> </thead> <tbody> <tr> <td data-bbox="480 1525 699 1693">Group Project at the end of the course including written paper and presentation</td> <td data-bbox="699 1525 935 1693"></td> <td data-bbox="935 1525 1155 1693">120</td> <td data-bbox="1155 1525 1375 1693">21./22.11.2019</td> </tr> </tbody> </table>	Type of Assessment	Duration/ length	Performance Points	Date/ Due Date	Group Project at the end of the course including written paper and presentation		120	21./22.11.2019
Type of Assessment	Duration/ length	Performance Points	Date/ Due Date						
Group Project at the end of the course including written paper and presentation		120	21./22.11.2019						

Recommended Literature	<p><u>General Introduction:</u></p> <ul style="list-style-type: none"> Alpaydin, E. (2016): Machine Learning: The New AI, MIT Press Essential Knowledge Schutt, R.; O'Neil, C. (2013): Doing Data Science, O'Reilly Media <p><u>Methods and Algorithms:</u></p> <ul style="list-style-type: none"> Alpaydin, E. (2016): Introduction to Machine Learning, Third Edition, MIT Press Hastie, T.; Tibshirani, R.; Friedman, J. (2009): The Elements of Statistical Learning, Second Edition, Springer <p><u>Implementation:</u></p> <ul style="list-style-type: none"> Aurélien Géron (2017): Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, O'Reilly Raschka, Sebastian (2015): Python Machine Learning, Packt Publishing
Module Structure	<ol style="list-style-type: none"> Data Analytics <ol style="list-style-type: none"> 1.1 What is Data Science? 1.2 Statistics and Machine Learning 1.3 Data Preparation 1.4 Exploratory Data Analysis Methods, Algorithms, and Applications <ol style="list-style-type: none"> 2.1 Classification 2.2 Regression 2.3 Segmentation 2.4 Association Analysis
Usability in other Modules/Programmes	All quantitative modules in the following semesters.
Last Approval Date	2019/09/06

Managing and storing Big Data

Module Coordinator		Thomas Mick			
Programme(s)		<i>Master in Applied Data Science</i>			
Term		<i>1Q2</i>			
Module Duration		<i>1 quarter</i>			
Compulsory/ Elective Module		Compulsory			
Credits		6 ECTS			
Frequency		Annually / 1 time			
Language of Instruction		English			
Total Workload:	150	Contact hours	44	Independent Learning	106
Prerequisites					
Content		<p>The first part deals with database technologies with a focus on both relational database management systems and the basics of NO-SQL and graph databases.</p> <p>The second part shows the differences between database management systems and Big Data Platforms and how both technologies can be meaningfully combined.</p> <p>In a third part, all knowledge acquired until then is applied in a project in which the students work together in teams to analyze real data and present the result of the analysis to the other teams.</p>			
Intended Learning Outcomes		<p>On successful completion of this module, students will have a thorough comprehension of data management in a big data environment, i.e. they:</p> <ul style="list-style-type: none"> • understand general concepts how to plan and set up a data pipeline • know when to use different tools to read, manipulate and store data • can use relational database management systems to work with structured data • can use NO SQL databases for the management of unstructured and semi-structured data • are able to successfully analyze graph-based data by using graph databases 			

	<ul style="list-style-type: none"> are able to successfully use big data platforms and create data pipelines within them are able to organize themselves in a team to manage and analyze data, to extract knowledge from data and present the results in a concise and meaningful way. 																								
Forms of teaching, methods and support	Lectures, Programming Assignments/Course projects, written Exam.																								
Type of Assessment(s) and performance points	<table border="1"> <thead> <tr> <th>Type of Assessment</th> <th>Duration</th> <th>Performance Points</th> <th>Due Date oder Date of Exam</th> </tr> </thead> <tbody> <tr> <td>Programming assignments</td> <td>In class</td> <td>40</td> <td>In class</td> </tr> <tr> <td>Data Analysis Project</td> <td>In class</td> <td>40</td> <td>In class</td> </tr> <tr> <td>Final exam</td> <td>40 min+5</td> <td>40</td> <td>20.12.2019</td> </tr> </tbody> </table>	Type of Assessment	Duration	Performance Points	Due Date oder Date of Exam	Programming assignments	In class	40	In class	Data Analysis Project	In class	40	In class	Final exam	40 min+5	40	20.12.2019								
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Recommended Literature	None																								
Module Structure	<table border="1"> <thead> <tr> <th>Session</th> <th>Topic</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Introduction</td> </tr> <tr> <td>2</td> <td>SQL basic</td> </tr> <tr> <td>3</td> <td>Architecture of Relational Database Management Systems</td> </tr> <tr> <td>4</td> <td>SQL advanced</td> </tr> <tr> <td>5</td> <td>Data pipeline architectures</td> </tr> <tr> <td>6</td> <td>PL/SQL</td> </tr> <tr> <td>7</td> <td>Programming assignments RDBMS</td> </tr> <tr> <td>8</td> <td>NO-SQL Databases</td> </tr> <tr> <td>9</td> <td>Graph Databases</td> </tr> <tr> <td>10</td> <td>Big Data Frameworks</td> </tr> <tr> <td>11</td> <td>Big Data Project</td> </tr> </tbody> </table>	Session	Topic	1	Introduction	2	SQL basic	3	Architecture of Relational Database Management Systems	4	SQL advanced	5	Data pipeline architectures	6	PL/SQL	7	Programming assignments RDBMS	8	NO-SQL Databases	9	Graph Databases	10	Big Data Frameworks	11	Big Data Project
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Usability in other modules/programmes																									
Last Approval Date	<i>31.10.2019</i> <i>Vera Schenderlein</i>																								

Marketing [MGT71420]

Module Coordinator		Meinert, Britta			
Programme(s)		MSc MiM			
Term		Semester 1 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Strategic Management			
Content		<p>1. Product Management 1.1 Innovation Management 1.2 Management of Established Products 1.3 Brand Management</p> <p>2. Price Management 2.1 Fundamentals of Classical Pricing Theory 2.2 Price Determination and Discrimination 2.3 Principles of Behavioral Pricing</p> <p>3. Sales Management 3.1 Design and Structure of the Sales System 3.2 Customer Relationship Management 3.3 Managing Relationships with Sales Partners</p> <p>4. Communications Management 4.1 Communication Planning and Budgeting 4.2 Design of Communication Measures 4.3 Monitoring the Impact of Communication</p>			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of Marketing, i.e. they can</p> <ul style="list-style-type: none"> • Understand the terminology, concepts and tools of modern marketing practice • Thoroughly comprehend the elements of the marketing mix and the importance of integrating these elements • Explain the key aspects of each of the four marketing instruments (product management, price management, sales management and communications management) <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply advanced knowledge in Marketing and to solve marketing managerial problems, i.e. they can</p> <ul style="list-style-type: none"> • Apply the key tools that marketers use to analyse market situations • Use the marketing instruments to react accordingly to these situations • Demonstrate effective presentation skills <p><i>Competences:</i> On successful completion of this module, students can solve a real life marketing case, i.e. they can</p> <ul style="list-style-type: none"> • Analyse a real life market situation correctly • Apply key marketing principles to real marketing issues • Coordinate decisions between team members • Develop solutions to specific issues in teams and present their results
Forms of teaching, methods and support	Lecture, discussion, exercises, quizzes, group work, case studies
Type of Assessment(s) and performance	-
Recommended Literature	<p>Textbook:</p> <ul style="list-style-type: none"> • Christian Homburg, Sabine Kuester and Harley Krohmer (2012), Marketing Management: A Contemporary Perspective, Second Edition, McGraw-Hill <p>Case study: In cooperation with Procter & Gamble</p>
Module Structure	This course provides a detailed overview of the four marketing instruments (product management, price management, sales management and communications management). A close cooperation with Procter & Gamble provides students with the opportunity to apply the key concepts to practical business situations.
Usability in other Modules/Programmes	Marketing modules in the concentrations
Last Approval Date	2019/06/13

Quantitative Fundamentals [QUM71110]

Module Coordinator		Nagler, Jan			
Programme(s)		Master in Applied Data Science			
Term		-			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Mathematics on high-school level, in particular algebra and analysis. Very basic knowledge in Python including NumPy, available, e. g., at Github, http://cs231n.github.io/python-numpy-tutorial/			

Content	<p>Part 1: Linear Algebra</p> <ol style="list-style-type: none"> 1. Scalars, Vectors, Matrices, and Tensors 2. Matrix and Vector Multiplication 3. Identity and Inverse Matrices 4. Linear Dependence and Span 5. Norms <ul style="list-style-type: none"> • Measuring the size of a vector with L_p • The Euclidean norm (L_2) • The max norm (L_1) • Frobenius norm 1. Special kinds of matrices <ul style="list-style-type: none"> • Diagonal • Symmetric • Unit vector & unit norm • Orthogonal vectors and orthogonal matrices 1. Eigendecomposition 2. Singular Value Decomposition 3. The Moore-Penrose Pseudoinverse 4. The Trace Operator and Determinant <p>Part 2: Useful functions, Iterated maps and Convergence Problems</p> <ol style="list-style-type: none"> 1. Sigmoid function 2. Softplus 3. Derivatives 4. Simple maps 5. Chaotic maps 6. Convergence Problems <p>Part 3: Probability</p> <ol style="list-style-type: none"> 1. Introduction to Probability <ul style="list-style-type: none"> • Discrete variables and probability mass functions • Continuous variables and probability density functions • Marginal and conditional probability • Chain rule • Independence and Conditional Independence • Bayes rule • Expectation, Variance and Covariance • Transformation of random variables 1. Common Probability Distributions <ul style="list-style-type: none"> • Bernoulli distribution • "Multinoulli" distributions • Gaussian distribution • Exponential and Laplace • Dirac distribution and cumulative distributions 1. Bayesian networks 2. Self-information & Entropy
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Intended Learning Outcomes	<p>Knowledge: The students will acquire a basic understanding of linear algebra, convergence problems, probability theory, and their use in machine learning and data science.</p> <p>Skills: Upon the successful completion of the course, students are able to</p> <ul style="list-style-type: none"> • represent and perform numerical operations on systems of linear equations in linear algebraic terms • critically assess and select appropriate norms for measuring vector length • construct, calculate, and critically assess common forms of probabilistic and statistical reasoning, • construct, calculate, and critically assess common forms of information theoretic methods 								
Forms of teaching, methods and support	<p>The course will consist in theoretical lectures, where theory and theoretical insights are covered. In addition, there will be tutorials and Python exercises, where students will begin work on that week's programming assignment, which will be completed outside of class. The Professor will be available to help students.</p>								
Type of Assessment(s) and performance	<table border="1" data-bbox="480 1014 1378 1151"> <thead> <tr> <th>Type of Assessment</th> <th>Duration/ length</th> <th>Performance Points</th> <th>Date/ Due Date</th> </tr> </thead> <tbody> <tr> <td>Written Exam</td> <td>120 min</td> <td>120</td> <td>November 2019</td> </tr> </tbody> </table> <p>There will be one final written exam in the end, and tutorials/exercises which start in the class and homework outside will be finalized outside class. Assessment will be only via the final written exam (120 points). The exercises (together with the lectures) will prepare the students for the final exam.</p>	Type of Assessment	Duration/ length	Performance Points	Date/ Due Date	Written Exam	120 min	120	November 2019
Type of Assessment	Duration/ length	Performance Points	Date/ Due Date						
Written Exam	120 min	120	November 2019						
Recommended Literature	<ul style="list-style-type: none"> • Gentle, J.E. (2017). Matrix Algebra: Theory, Computations, and Applications in Statistics, 2nd. Ed. Springer. • Savov, I. (2017). No Bullshit Guide to Linear Algebra. 2nd Ed. Minireference Co. • Murphy, K. P. (2012). Machine Learning: A Probabilistic Perspective, MIT Press. • Cover, T. M and Thomas, J. A. (2006). Elements of Information Theory, 2nd Edition. Wiley. 								

Module Structure	Session Topic Preparation 1 Scalars, Vectors, Matrices, Tensors, Matrix and Vector Multiplication 2 Identity and Inverse Matrices, Linear Dependence and Span 3 Norms 4 Special kinds of matrices 5 Eigendecomposition, Singular Value Decomposition 6 The Moore-Penrose Pseudoinverse, The Trace Operator and Determinant 7 Useful functions 8 Iterated maps and Convergence Problems 9 Introduction to Probability: Discrete variables and probability mass functions, Continuous variables and probability density functions, Marginal and conditional probability, Chain rule, Independence and Conditional Independence, Bayes rules, Expectation, Variance and Covariance 10 Common Probability Distributions 11 Bayesian networks Self-Information & Entropy
Usability in other Modules/Programmes	Machine Learning 1, Machine Learning 2
Last Approval Date	2019/09/06

Statistics & Econometrics [QUM71020]

Module Coordinator		Vecer, Jan			
Programme(s)		MSc MF			
Term		Semester 1 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Basic knowledge in Mathematics (differential and integral calculus, linear algebra) and statistical methods (descriptive and inferential statistics, econometrics)			
Content		<p>Elements of Probability Theory:</p> <ul style="list-style-type: none"> • Probability Basics • Discrete Distributions (Binomial, Poisson, Geometric) • Expectation and Variance • Behaviour of Large Sample (Law of Large Numbers) • Central Limit Theorem, Normal Distribution • Typical Values of a Random Variable, Quantiles • Conditional Probability and Independence • Covariance and Correlation <p>Statistics and Econometrics:</p> <ul style="list-style-type: none"> • Point Estimation of the Mean and the Variance • Maximum Likelihood Estimation • Interval Estimation • t, F and chi2 distributions • Regression Analysis <p>Elements of Programming:</p> <ul style="list-style-type: none"> • Introduction to Python • Applications in Probability (Monte Carlo Simulation) • Applications in Statistics (Regression Analysis) 			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of general statistical principles, i.e. they can:</p> <ul style="list-style-type: none"> • explain general statistical principles with a special focus on economic and financial applications • illustrate econometric models • distinguish signal from randomness (noise) <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply statistical and econometric methods to examples and cases from practical finance, i.e. they can:</p> <ul style="list-style-type: none"> • apply statistical tools used in academic literature • implement data analysis in Python and other mainstream programming languages • compare adequately econometric models • demonstrate a competent level of logical thinking and analytical reasoning • interpret the estimated results • implement data analysis using the mainstream programming languages (Python) <p><i>Competence:</i> On successful completion of this module students can tackle some statistical and econometric problems, i.e. they can:</p> <ul style="list-style-type: none"> • critically evaluate business and financial proposals they may have to assess
Forms of teaching, methods and support	The concepts explained in the class are illustrated with additional exercises (questions from previous finals) and case studies that are part of the lecture notes. Most of the exercises are solved. In addition, the examples are illustrated with the corresponding computer code in Python and graphically plotted where appropriate. In addition, the examples are illustrated with the corresponding computer code (Python, R) and graphically plotted where appropriate.
Type of Assessment(s) and performance	-
Recommended Literature	<ul style="list-style-type: none"> • Vecer (2018): Probability and Statistics, Lecture Notes • Additional material will be distributed in the course
Module Structure	Since experience shows that the mathematical and statistical skills of students who specialise in economics and finance differ substantially because of different backgrounds, this module is supposed to provide a common ground for all of them as a starting platform.
Usability in other Modules/Programmes	Subsequent modules
Last Approval Date	2019/08/28

Accounting [ACC70610]

Module Coordinator		Grüning, Michael			
Programme(s)		MSc MiM			
Term		Semester 1 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Basic knowledge in accounting from the Bachelor studies or completion of the preparatory course in accounting			
Content		<p>The aim of this module is to introduce students to the principles of financial and managerial accounting. Students will gain an understanding of the structure, details and interconnections between the balance sheet, income statement and cash flow statement. Students will also explore relevant sections of management accounting including cost accounting, planning, control and performance management. More specifically, the topics discussed in lectures will flow as follows:</p> <ul style="list-style-type: none"> • Introduction to Accounting • Accounting Statements • Financial Statement Analysis • Introduction to Management and Cost Accounting • Cost Accumulation for Inventory Valuation and Profit Measurement • An introduction to financial statements analysis • Introduction to Management and Cost Accounting • Cost Accumulation for inventory valuation and profit measurement • Information for decision making • Information for planning, control and performance measurement • Cost management and Strategic Accounting 			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of the constituent, the approach and the evaluation of accounting statements, i.e. they can:</p> <ul style="list-style-type: none"> • Differentiate the fields and methods of management accounting • Explain management accounting tools and techniques • Describe the structure of accounting statements <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to interpret financial statements and use various management accounting tool appropriately, i.e. they can:</p> <ul style="list-style-type: none"> • Analyse financial statements • Apply appropriate management accounting tools • Assess the structure, details and interconnections between the balance sheet, income statement and cash flow statement <p><i>Competencies:</i> On successful completion of this module, students can evaluate the economic situation of a firm and by using appropriate tools in a decision making process, i.e. they can:</p> <ul style="list-style-type: none"> • Assess financial statements • Report about cost situation using planning, control and performance management indicators
Forms of teaching, methods and support	Lecture, practical exercises, interactive discussion, videos
Type of Assessment(s) and performance	-
Recommended Literature	<ul style="list-style-type: none"> • Label, Wayne A.: Accounting for Non-Accountants, 3rd ed. Naperville : Sourcebook, 2013. – ISBN 978-1-4022-7304-9 • Drury, Colin: Management and Cost Accounting, 10th ed. London : Cengage, 2018. – ISBN 978-1-473-74887-3
Module Structure	Lectures will take place in November/December. This module provides a comprehensive introduction into financial and managerial accounting. Various aspects of both areas of accounting will be discussed and at the end of the module students should have a clear understanding of the differences and importance of both financial and managerial accounting. This will be tested in a final written exam after the course.
Usability in other Modules/Programmes	Electives
Last Approval Date	2019/09/23

**AI & Humanity - Ethics of Data Science
[INF72030]**

Module Coordinator		Köhler, Sebastian			
Programme(s)		Master in Applied Data Science			
Term		4th Quarter			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Previous module			
Content		<p>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.</p>			

Intended Learning Outcomes	<p><i>Knowledge:</i> 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</p> <ul style="list-style-type: none"> • 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. <p><i>Skills:</i> 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</p> <ul style="list-style-type: none"> • 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. <p><i>Competencies:</i> 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</p> <ul style="list-style-type: none"> • 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. 																				
Forms of teaching, methods and support	Practical seminar with critical reflection																				
Type of Assessment(s) and performance	<table border="1"> <thead> <tr> <th>Type of Assessment</th> <th>Duration</th> <th>Performance Points</th> <th>Due Date or Date of Exam</th> </tr> </thead> <tbody> <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> </tbody> </table>	Type of Assessment	Duration	Performance Points	Due Date or Date of Exam	Argumentative exercises	tbd	30	during term	Discussion essay	tbd	30	during term	Independently researched essay	tbd	30	during term	Essay on legal issues	tbd	30	during term
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Discussion essay	tbd	30	during term																		
Independently researched essay	tbd	30	during term																		
Essay on legal issues	tbd	30	during term																		

Recommended Literature	<ul style="list-style-type: none"> • 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: Oxford University Press
Module Structure	<ol style="list-style-type: none"> 1. The Law & AI <ul style="list-style-type: none"> • Data Protection Law • Pioneering in Cyberspace and Cyberlaw 1. Ethics & AI <ul style="list-style-type: none"> • 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
Usability in other Modules/Programmes	AI The New Frontier
Last Approval Date	2020/04/06

Business Economics [ECO70610]

Module Coordinator		Dertwinkel-Kalt, Markus			
Programme(s)		MSc MiM			
Term		1 Semester Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Basic knowledge in economics from the Bachelor studies or completion of the preparatory course in economics			
Content		<p>The first part of this course gives an introduction into classical microeconomics. Economics is based on three key principles: optimization, equilibrium, and empiricism. We apply these principles to markets and discuss perfect and imperfect competition. We will learn under which conditions <i>the invisible hand of the market</i> creates harmony between the interests of the individual and those of society. We will also learn under which conditions markets fail, which requires regulation. Market failure may occur, for instance, in the presence of externalities - that is, consequences on third parties that are not priced - or the presence of asymmetric information between the supplier of a good and its customer.</p> <p>The second part gives an overview of the established and yet growing field of behavioral economics and behavioural finance in particular. Behavioral economics posits that many financial and other economic phenomena may be better understood assuming that some individuals are less than fully rational. More generally, behavioural economics aims for psychologically more realistic explanations of economic phenomena. We touch/cover topics such as: the foundations of behavioral economics in social and cognitive psychology (group, preference, and belief biases), decision making under uncertainty, time preferences and self-control, experimental economics, fairness, and selected topics in behavioral finance.</p>			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of the fundamental ideas and approaches of microeconomics in general and behavioral economics in particular, with a special focus on the sub-field of behavioral finance. They can:</p> <ul style="list-style-type: none"> • Reflect the fundamental analytical and conceptual approaches in microeconomics • Explain the main concepts and assumptions that traditional and behavioral economics rely upon <p>Explain major insights that were achieved by employing concepts from behavioral economics</p> <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply knowledge in economics, that is, they can apply microeconomic tools to the analysis of markets, competition policy, and regulation.</p> <p>In addition, they will have the proven ability to apply advanced knowledge that governs actual behavior in economic situations. They can analyse the application of behavioral concepts in different real-world settings that may involve, among others</p> <ul style="list-style-type: none"> • consumer purchasing decisions • risk taking • investment behavior <p><i>Competences:</i> On successful completion of this module, students have a thorough understanding of the essential principles of economic analysis. They can evaluate the potential and the limitations of alternative theoretical approaches in economics. In particular, they can examine real-world economic decision problems in different (microeconomic) policy fields.</p> <p>In addition, they can take responsibility to transfer concepts from behavioral economics to make better decisions for themselves and for others. The understanding and awareness of pitfalls such as overconfidence, overextrapolation, loss aversion, skewness preference, reference-dependence, narrow framing, myopia, or time-inconsistency makes them more competent in making and assessing investment decisions and many other intertemporal decisions that must be taken under risk and uncertainty.</p>
Forms of teaching, methods and support	Teaching in this module will include traditional lectures and some practical exercises. Students need to be active and well-prepared, work in teams, and contribute regularly to in-class discussions.
Type of Assessment(s) and performance	-

Recommended Literature	<p>Acemoglu, D., Laibson, L., List, J. (2017): Microeconomics, 2nd Edition, Pearson.</p> <p>Ariely, D. (2010): Predictably Irrational, Harper.</p> <p>Aronson, E., T. Wilson, and R. Akert (2010): Social Psychology, Prentice Hall.</p> <p>Barberis, N. C. (2013a): "Psychology and the Financial Crisis 2007-2008," in Financial Innovation: Too Much or Too Little?, ed. by M. Haliassos, 15–28.</p> <p>Barberis, N. C. (2013b): "The Psychology of Tail Events: Progress and Challenges," American Economic Review Papers and Proceedings, 103, 611–616.</p> <p>Barberis, N. C. (2013c): "Thirty Years of Prospect Theory in Economics: A Review and Assessment," Journal of Economic Perspectives, 27, 173–196.</p> <p>Barberis, N. C. and R. H. Thaler (2003): "A Survey of Behavioral Finance," in Handbook of the Economics of Finance, ed. by G. Constantinides, M. Harris, and R. Stulz, 1052–1121.</p> <p>Cartwright, E. (2014): Behavioral Economics, Routledge.</p> <p>Dhmi, S. (2016): The Foundations of Behavioral Economic Analysis, Oxford University Press.</p> <p>Kahneman D. (2011): Thinking, Fast and Slow, Farrar, Straus and Giroux.</p> <p>Thaler, R. and C. Sunstein (2008): Nudge, Yale University Press.</p>
Module Structure	<p>Class sessions will include lectures (including interactive discussions and some exercises) as well as presentations by students. 50% of the final grade is based on the in-class performance, i.e. the presentation as well as constructive participation during the lectures and other students' presentations. An exam determines the remaining 50% of the final grade. Depending on the number of students participating in the course, presentations will be done in groups. More detailed information will be given in the syllabus.</p>
Usability in other Modules/Programmes	<p>Subsequent modules of the programme.</p>
Last Approval Date	<p>2019/09/23</p>

Corporate Finance [FIN72015]

Module Coordinator		Zeng, Jing			
Programme(s)		MSc MF			
Term		Semester 1 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Foundations of Finance, Macro- & Monetary Economics, Financial Statement Analysis			
Content		<p>The purpose of this module is to introduce techniques of financial analysis, with emphasis on the main topics in corporate finance. The concepts developed in this module form the foundation for all elective finance modules. The module focuses on concepts that can be applied directly to real-life financial decision making. The main topics covered include hurdle rates and the cost of capital (i.e., the investment decision), the mix of debt and equity and choosing the right kind of debt (i.e., the financing decisions), and the return of cash to shareholders (i.e., the dividend decision). There will be several studies complementing the module. The cases help to apply the acquired tools and concepts to real-world problems.</p> <p>Grading: The total grade will be determined by both individual and group activities:</p> <ul style="list-style-type: none"> • Case study: 40 performance points • Presentation of academic article: 40 performance points • Final written closed-book exam: 40 performance points <p>The total grade will be determined by both individual (exam) and group activities (case study and presentation of academic articles).</p>			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have an in-depth understanding of corporate finance and related topics, e.g. they can:</p> <ul style="list-style-type: none"> • Illustrate corporate governance mechanisms • Explain project and company valuation • Understand financing sources and capital structure theories <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply the gained knowledge and studied methods to the corporate finance setting, e.g. they can:</p> <ul style="list-style-type: none"> • Estimate adequate hurdle rates for project decisions • Evaluate business opportunities • Choose the right type and amount of debt financing • Critically assessing corporate financial decisions <p><i>Competence:</i> On successful completion of this module, students can responsibly transfer these concepts to typical corporate finance situations, e.g. they can:</p> <ul style="list-style-type: none"> • Build corporate governance structures • Make educated capital budgeting and financing decisions
Forms of teaching, methods and support	Lectures & Case study discussions
Type of Assessment(s) and performance	-
Recommended Literature	Damodaran, A., Applied Corporate Finance, 4th ed., John Wiley & Sons
Module Structure	<ul style="list-style-type: none"> • Objective of Corporate Finance • Corporate Governance • Cost of capital • Time weighted, incremental cash flow returns • From earnings to cash flows • NPV vs. IRR • Synergies in projects • Options in projects • Trade off on debt • Determinants of optimal debt ratio • Dividend policy • Valuation modeling in Excel • Investment banking cases
Usability in other Modules/Programmes	Subsequent modules in all concentrations; Master's Thesis
Last Approval Date	2019/02/12

Machine Learning I [INF72010]

Module Coordinator		Wheeler, Gregory			
Programme(s)		MSc MADS			
Term		3rd Quarter			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Semester 1,, Python			
Content		<p>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.</p> <p>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.</p> <p>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).</p>			

<p>Intended Learning Outcomes</p>	<p><i>Knowledge:</i> 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).</p> <p><i>Skills:</i> 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</p> <ul style="list-style-type: none"> • 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 <p><i>Competencies:</i> 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:</p> <ul style="list-style-type: none"> • 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. 												
<p>Forms of teaching, methods and support</p>	<p>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.</p> <p>In addition to the Professor, there will be Teaching Assistants for the course available to help students.</p>												
<p>Type of Assessment(s) and performance</p>	<table border="1"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance Points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <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>During exam week</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Five (5) Programming Assignments	tbd	70	During the module	Written exam	50 min	50	During exam week
Type of examination	Duration or length	Performance Points	Due date or date of exam										
Five (5) Programming Assignments	tbd	70	During the module										
Written exam	50 min	50	During exam week										

Recommended Literature	<p>We will use the following resources:</p> <ul style="list-style-type: none"> • 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/ <p>In addition, for programming tips in Python, students may wish to consult</p> <ol style="list-style-type: none"> 1. Wes McKinney (2013), Python for Data Analysis. Sebastopol, CA: O'Reilly
Module Structure	<p>The module structure consists of four components:</p> <ol style="list-style-type: none"> 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
Usability in other Modules/Programmes	Subsequent modules
Last Approval Date	2020/02/04

Machine Learning II [INF72040]

Module Coordinator		Nagler, Jan			
Programme(s)		Master in Applied Data Science			
Term		4th Quarter			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		German			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Quantitative Fundamentals & Machine Learning I			
Content		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.			
Intended Learning Outcomes		<p><i>Knowledge:</i> 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.</p> <p>Specifically, they knowledge</p> <ul style="list-style-type: none"> • 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 <p><i>Skills:</i></p> <ul style="list-style-type: none"> • can implement sophisticated MCMC methods regression problems; • can build an ensemble of machine learning techniques to solve a complicated, real-world problem. 			
Forms of teaching, methods and support		Lecture and programming assignments			

Type of Assessment(s) and performance	Type of Assessment	Duration	Performance Points	Due Date or Date of Exam
	Five (5) Programming Assignments	tbd	70	During Module
	Final Exam	50 min	50	Exam Week
Graded Programming Assignments and Final Exam.				
Recommended Literature	<ul style="list-style-type: none"> Kevin P. Murphy (2012), Machine Learning: A Probabilistic Perspective, MIT Press. 			
Module Structure	<ol style="list-style-type: none"> Regression, Regularization & Preprocessing <ol style="list-style-type: none"> Correlation-based dimensionality reduction Principle Component Analysis (PCA) Regularization Bayesian Methods <ol style="list-style-type: none"> Latent Variables Models Expectation Maximization (EM) Variational Inference & Sampling (Gibbs & Metropolis) Markow Chain Monte Carlo (MCMC) Gaussian Mixture Model Hidden Markow models (HMM) Supervised and Unsupervised Learning: Applications, Tools & Libraries 			
Usability in other Modules/Programmes	Co-op Project and thesis			
Last Approval Date	2020/02/04			

Macro- & Monetary Economics [ECO71010]

Module Coordinator		Winkler, Adalbert			
Programme(s)		MSc MF			
Term		Semester 1 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		None			
Content		<p>I Macroeconomics with microeconomic foundations – The Neoclassical Model</p> <p>I.1 Methodological approach I.2 The labour market I.3 The goods market I.4 The money market I.5 The complete neoclassical model</p> <p>II Keynesian Macroeconomics</p> <p>II.1 Methodological approach II.2 The labour market II.3 The goods market II.4 The money market II.5 The complete Keynesian model</p> <p>III Monetary Economics</p> <p>III.1 Money and the money supply process III.2. Conventional monetary policy - instruments. transmission, targets and rules III.3 Monetary policy strategies III.4 Unconventional monetary policy - instruments and transmission III.5 Monetary economics in an open economy</p>			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of the major models of macroeconomic and monetary theory, i.e. they can:</p> <ul style="list-style-type: none"> • Explain the working of labor, goods, capital and money markets within the respective theories • Compare and contrast theories with regard to interdependence / independence of markets, the neutrality of money, wage and price stickiness and macroeconomic policies, notably monetary policy • Explain the macroeconomic policy approaches with regard to stabilizing the price level and employment. <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply advanced knowledge to macroeconomic and monetary policy making, i.e. they can:</p> <ul style="list-style-type: none"> • Analyse the application of monetary policy instruments in different economic settings • Assess and appraise macroeconomic, notably monetary policy, as conducted in mature market economies • Demonstrate effective skills in comprehension of macroeconomic modelling <p><i>Competence:</i> On successful completion of this module, students can take responsibility to transfer these models to typical policy making decisions such as: changing the fiscal balance, changing interest rates and changing central bank balance sheets.</p>
Forms of teaching, methods and support	Interactive Lecture
Type of Assessment(s) and performance	-

Recommended Literature	<p>I Macroeconomics with microeconomic foundations – The Neoclassical model</p> <ul style="list-style-type: none"> Williamson, S. (2016), <i>Macroeconomics</i>, 6th ed., Pearson: Boston et al., pp. 1 – 37, 98-141, 306 - 350, 379 – 440 <i>Journal of Economic Perspectives</i>, 32(2), Summer 2018: Symposium: Macroeconomics a Decade after the Great Recession, p. 3-194 <p>II Keynesian Macroeconomics</p> <ul style="list-style-type: none"> Williamson, S. (2008), <i>Macroeconomics</i>, 3rd ed., Pearson: Boston et al., pp. 441 - 474 <i>Journal of Economic Perspectives</i>, 32(2), Summer 2018: Symposium: Macroeconomics a Decade after the Great Recession, p. 3-194 <p>III Monetary Economics</p> <ul style="list-style-type: none"> Bofinger, P. (2001), <i>Monetary Policy</i>, Oxford University Press: Oxford , pp. 1- 6, 11-15, 40-53, 71-102, 105 – 116, 127 – 153, 164 – 202, 205 – 228, 240 – 274, 300 – 307, 387 – 403 Borio, C. and A. Zabai (2016). <i>Unconventional monetary policies: a reappraisal</i>. BIS Working Papers No. 570, Basel. Deutsche Bundesbank (2017), <i>The role of banks, non-banks and the central bank in the money creation process</i>, Monthly Report, April, 13-33 Debate On Monetary Policy And Interest Rates, Tuesday, May 16, 2017 Landau Economic Building, Stanford University, http://www.hoover.org/news/has-neutral-interest-rate-declined-and-how-does-it-affect-fed-decisions Krugman, P. and M. Obstfeld (2009), <i>International Economics – Theory and Policy</i>, Pearson: Boston et. al., pp. 628 – 655
Module Structure	I Macroeconomics with microeconomic foundations – The neoclassical model II Keynesian macroeconomics III Monetary economics
Usability in other Modules/Programmes	Subsequent modules
Last Approval Date	2019/08/15

Visualising Big Data [INF72020]

Module Coordinator		Tomak, Kerem			
Programme(s)		Master in Applied Data Science			
Term		3rd Quarter			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Modules Computation Semantics: Data Structures and Algorithms has to be covered.			
Content		<p>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.</p>			
Intended Learning Outcomes		<p><i>Knowledge:</i> On successful completion of this module, students will have thorough comprehension of big data strategy implementation, i. e. they:</p> <ul style="list-style-type: none"> • 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 <p><i>Skills:</i> On successful completion of this module, students will have a thorough comprehension of big data strategy implementation, i. e. they:</p> <ul style="list-style-type: none"> • Can extract information from large datasets, using a visualization tool • Can effectively use visualization tools to "tell stories" <p><i>Competence:</i> Upon completing the course, students will have the ability to create an end-to-end visualization delivery to support a business outcome/story.</p>			
Forms of teaching, methods and support		Lectures, programming assignments, and exam.			

Type of Assessment(s) and performance	<table border="1"> <thead> <tr> <th data-bbox="480 342 700 421">Type of Assessment</th> <th data-bbox="700 342 935 421">Duration</th> <th data-bbox="935 342 1155 421">Performance Points</th> <th data-bbox="1155 342 1375 421">Due Date or Date of Exam</th> </tr> </thead> <tbody> <tr> <td data-bbox="480 421 700 524">Data processing and creating visualization</td> <td data-bbox="700 421 935 524">in class</td> <td data-bbox="935 421 1155 524">40</td> <td data-bbox="1155 421 1375 524">in class</td> </tr> <tr> <td data-bbox="480 524 700 663">Programming assignments- Managing & Visualising</td> <td data-bbox="700 524 935 663">in class</td> <td data-bbox="935 524 1155 663">40</td> <td data-bbox="1155 524 1375 663">in class</td> </tr> <tr> <td data-bbox="480 663 700 741">Final Exam</td> <td data-bbox="700 663 935 741">45 min</td> <td data-bbox="935 663 1155 741">40</td> <td data-bbox="1155 663 1375 741">during exam week</td> </tr> </tbody> </table>	Type of Assessment	Duration	Performance Points	Due Date or Date of Exam	Data processing and creating visualization	in class	40	in class	Programming assignments- Managing & Visualising	in class	40	in class	Final Exam	45 min	40	during exam week
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Data processing and creating visualization	in class	40	in class														
Programming assignments- Managing & Visualising	in class	40	in class														
Final Exam	45 min	40	during exam week														
Recommended Literature	<ul style="list-style-type: none"> • 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 																
Module Structure	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																
Usability in other Modules/Programmes	All subsequent courses, Master's Thesis																
Last Approval Date	2020/02/04																

Consumer Behaviour [MGT70980]

Module Coordinator		Atalay, Selin															
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:	44 h	Independent Learning:	106 h												
Prerequisites		A Review of the topic-specific literature is required.															
Content		<ul style="list-style-type: none"> • Scientific Approach to Consumer Behavior • How Consumers Acquire, Remember and Use Knowledge • How Consumers Make Decisions • Influence and Persuasion 															
Intended Learning Outcomes		<p>Upon completion of this course, students:</p> <ul style="list-style-type: none"> • Will have learned the key behavioral and psychological concepts and will have developed the intellectual ability to apply them in analyzing marketing situations. • Will be able to understand consumers' consumption-related behaviors. • Will be able to understand consumer trends. • Will be able to develop and evaluate marketing strategies intended to influence consumption-related behaviors. • Will be able to develop successful products, retail environments and marketing communications. 															
Forms of teaching, methods and support		Please see content.															
Type of Assessment(s) and performance		<table border="1"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance Points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td>Assignments & Cases & In class exercises</td> <td>During the module</td> <td>60</td> <td>During the module</td> </tr> <tr> <td>Group Project and Presentation</td> <td>During the module</td> <td>60</td> <td>During the module</td> </tr> </tbody> </table>				Type of examination	Duration or length	Performance Points	Due date or date of exam	Assignments & Cases & In class exercises	During the module	60	During the module	Group Project and Presentation	During the module	60	During the module
Type of examination	Duration or length	Performance Points	Due date or date of exam														
Assignments & Cases & In class exercises	During the module	60	During the module														
Group Project and Presentation	During the module	60	During the module														

Recommended Literature	Please see recommended literature in the online Campus.
Module Structure	The goal of this course is not to simply learn the material, but rather it is to integrate and apply it. Therefore, in class exercises, cases and real life implementations will be at the core of the course. By the end of this course, you should not only be familiar with a large body of consumer behavior knowledge, but you should also be able to apply this information to create and evaluate effective strategies and tactics.
Usability in other Modules/Programmes	Other Electives, Master's Thesis
Last Approval Date	2020/03/24

Corporate Valuation [FIN74380-1565946423341]

Module Coordinator		Ecker, Frank			
Programme(s)		MSc MF			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Foundations of Finance, Financial Statement Analysis, (Corporate Finance)			
Content		<ol style="list-style-type: none"> 1. Accounting basics: Relations between statements, ratio analyses, etc. 2. Recap of valuation basics: discount rates, etc. 3. Forecasting via pro-forma financial statements 4. Market-based (multiples) valuations 5. Free cash flow models 6. Accounting-based valuation models 7. Complexities in valuations: stock options, etc. 8. Steady state issues and remedies 			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have an in-depth understanding of different valuation techniques, e.g., they will be able to:</p> <ul style="list-style-type: none"> • Explain the main concepts and techniques of firm valuation • Compare and contrast the applicability of different valuation techniques • Describe the different assumptions of valuation and their implications <p><i>Skills:</i> On successful completion of this module, students will have the ability to:</p> <ul style="list-style-type: none"> • Apply valuation models to real world situations • Make appropriate inferences from and critically evaluate valuation results <p><i>Competence:</i> On successful completion of this module, students can take responsibility to transfer the knowledge and practiced methods in corporate valuation to real world situations, e.g. they can:</p> <ul style="list-style-type: none"> • Prepare and critically assess corporate valuations • Demonstrate independent problem solving ability 												
Forms of teaching, methods and support	Lectures, team-based case work and (final) valuation project												
Type of Assessment(s) and performance	<table border="1"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance Points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td>Valuation project (team)</td> <td>TBD</td> <td>30</td> <td>During the module (Presentation during last class)</td> </tr> <tr> <td>Written exam</td> <td>90 min</td> <td>90</td> <td>Exam week</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Valuation project (team)	TBD	30	During the module (Presentation during last class)	Written exam	90 min	90	Exam week
Type of examination	Duration or length	Performance Points	Due date or date of exam										
Valuation project (team)	TBD	30	During the module (Presentation during last class)										
Written exam	90 min	90	Exam week										
Recommended Literature	<ul style="list-style-type: none"> • Koller, T., M. Goedhardt and D. Wessels (McKinsey): Valuation - Measuring and Managing the Value of Companies, 6th edition, Wiley Finance, 2015 <p>To refresh finance basics:</p> <ul style="list-style-type: none"> • Damodaran, A.: Applied Corporate Finance, 4th ed., John Wiley & Sons • Berk, J., and P. De Marzo: Corporate Finance, 4th ed., Pearson International 												

Module Structure	<p>This course focuses on the valuation of equity securities. The tools and techniques consist of preparation of pro-forma financial statements, estimation and forecasting of free cash flows and other valuation attributes, application of valuation models (e.g., discounted dividend, free cash flows, abnormal earnings and economic profit), and understanding of market-multiples valuation approaches (e.g., price-earnings ratios, EBITDA multiples, etc.). We will emphasize the role of financial statement data in equity valuation, using advanced problems and cases developed from and around actual financial statements.</p> <p>The course is intended to provide students with a strong theoretical and applied understanding of the key equity valuation and stock selection approaches used by financial managers, securities analysts, investment/portfolio managers and consultants. The links between, and the limitations of these approaches will be discussed, so that students gain an understanding of the appropriateness of the different methods in different situations.</p> <p>The material (readings, cases, exercises, etc.) is designed for students who have little or no background in securities analysis and valuation. I assume a basic understanding of financial accounting, finance, and regression analysis. I also expect students to be able to manipulate Excel spreadsheets and to collect data from various financial databases.</p> <p>The topics covered are intended to complement related courses in Accounting (such as Financial Statement Analysis) and Finance (such as Corporate Restructuring and Corporate Finance in particular). This course should prove beneficial for students planning careers in investment banking, portfolio management, corporate finance, (financial) consulting and security analysis.</p> <p>Evaluation: Throughout the semester, there will be non-graded cases that will help apply the acquired tools to real-world problems and guide some in-class discussions. Towards the end of the course, you will also be asked to prepare a final project in the form of a written analyst report, possibly accompanied by a brief presentation of the main findings (class size and time permitting), covering a stock or transaction of my choosing. The total grade will be determined by:</p> <ul style="list-style-type: none"> • Valuation project (team): 30 performance points • Final exam (individual): 90 performance points
Usability in other Modules/Programmes	Other modules in the Corporate Finance and Financial Advisory Concentration
Last Approval Date	2020/02/03

Debt Finance [FIN71060-1565946423341]

Module Coordinator		Steffen, Sascha			
Programme(s)		MSc MF			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Foundations of Finance, Corporate Finance			
Content		<p>Topics</p> <ul style="list-style-type: none"> • Introduction to “Debt Finance” & Capital structure decisions of firms • Credit risk • Securitization • Bank lending and contract design • Loan syndication • Debt renegotiation • Secondary markets: Bonds & Loans • Leveraged loan markets and LBOs • Leveraged debt restructuring • Private equity investors in leveraged loans • Middle market lending, direct lending funds • FinTech approaches in raising capital 			

<p>Intended Learning Outcomes</p>	<p>Competencies developed</p> <p>The skills and knowledge that you will learn in this course comprise the techniques for financial decision making in an international setting, including</p> <ul style="list-style-type: none"> • Deciding between debt and equity • Financing international projects • Estimating the value of a businesses • Evaluating credit risk of firms • Structuring & negotiating loans • Understanding incentives in lending syndicates • Decide between bond vs loan financing • Explaining funding options available to firms • Understanding the role of commercial and investment banks in raising capital • Understanding causes and consequences of financial crises and the effect of regulation on economic growth <p>This course has two main learning objectives:</p> <ul style="list-style-type: none"> • Show proficiency in finance as a major business function in a global environment. • Display critical thinking and analytical ability for creativity and innovation.
<p>Forms of teaching, methods and support</p>	<p>The course is highly interactive with case studies/exercises in almost every class. Thus, you need to be prepared, have read the lecture material before the class in which they are discussed and be prepared to engage in a discussion which I moderate. I will cold-call students if I have the feeling they are not prepared. Some of the cases are more quantitative in nature but our focus is on the economics. The case studies complement a rigorous discussion of the underlying theory and introduction of institutional characteristics. I will draw from recent empirical and theoretical academic research whenever possible.</p> <p>There will be problem sets to review the material. Problem sets include concept questions (I want you to understand the "why" in addition to the "how") as well as empirical questions. I want you to work on these problem sets on time and I will discuss a subset of the question in two tutorials during the course.</p> <p>Guest speakers from highly reputable firms will strengthen your learning experience.</p>

Type of Assessment(s) and performance	<table border="1" data-bbox="480 342 1378 710"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td>Midterm exam</td> <td>30 minutes</td> <td>30</td> <td>During the module</td> </tr> <tr> <td>Final exam</td> <td>30 minutes</td> <td>30</td> <td>Exam week</td> </tr> <tr> <td>Case Studies</td> <td></td> <td>40</td> <td>During the module</td> </tr> <tr> <td>Class participation</td> <td></td> <td>20</td> <td>During the module</td> </tr> </tbody> </table> <p data-bbox="480 757 1461 954">I want to avoid clustering of performance points at the end of the course. That is why 90/120 points can be earned during the module and the final exam carries relatively little weight. The final exam is also not cumulative, i. e. topics that have been covered in the midterm exam won't be part of the final exam. Case study points can be earned across different case studies to avoid also clustering of points at a specific point during the module.</p> <p data-bbox="480 992 1449 1122">However, class participation is necessary for a successful learning outcome. That is why I put 20 points on class participation (which includes being present in class, engaging in the discussions, raising interesting questions etc.).</p>	Type of examination	Duration or length	Performance points	Due date or date of exam	Midterm exam	30 minutes	30	During the module	Final exam	30 minutes	30	Exam week	Case Studies		40	During the module	Class participation		20	During the module
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Final exam	30 minutes	30	Exam week																		
Case Studies		40	During the module																		
Class participation		20	During the module																		
Recommended Literature	<p data-bbox="480 1151 1345 1216"><u>Required:</u> Lecture Notes and Slides (and additional material I post throughout the class)</p> <p data-bbox="480 1252 1318 1317"><u>Recommended:</u> Berk, Jonathan, and Peter DeMarzo, <i>Corporate Finance</i>, Pearson International Edition.</p> <p data-bbox="480 1352 1329 1417">Those of you with a limited exposure to finance may also find the following additional text useful:</p> <p data-bbox="480 1453 1409 1552">Downes, John, and Jordan Elliot Goodman, <i>Barron's Financial Guides: Dictionary of Finance and Investment Terms</i>, 9th edition (Barron's Educational Series, 2014)</p>																				

Module Structure	<p>One of the critical activities a company must do well to succeed is the raising of capital. This course explores the role of financial intermediaries (such as commercial and investment banks or private equity firms) in helping non-financial firms raise capital. We study domestic and international funding markets and financial instruments available to firms to raise capital. We take the view of both the firm that wants to raise capital and the intermediaries who provide funds. While a large part of the class focuses on capital raising issues relevant to larger (publicly listed) firms, we also examine financing choices of smaller firms, so-called small-medium enterprises (SME).</p> <p>We cover topics in this course such as the bank debt versus bond debt, the process, participants and economics of loan syndication, importance of relationships between firms and intermediaries (and between intermediaries), credit risk, financial contracting, and private equity and leveraged buyouts (LBOs). We will discuss these topics also in the context of the 2008-2009 global financial crisis. While most of our discussion takes a micro-level perspective (with implications on firms and contracts etc.), we also discuss macroeconomic implications such as what current credit market conditions might imply for future economic development (e.g. GDP growth or aggregate investment and employment).</p>
Usability in other Modules/Programmes	Other modules in Corporate Finance Concentration
Last Approval Date	2020/01/31

Derivative Analysis [FIN71840]

Module Coordinator		Heidorn, Thomas			
Programme(s)		MSc MF			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Financial Products & Modelling			
Content		<p>Content:</p> <ol style="list-style-type: none"> 1. Forward and future contracts 2. Behaviour of Stock Prices (Wiener Process) 3. Black/Scholes vs. Cox / Ross / Rubinstein 4. Stock Options and Currency Options 5. Hedging Greeks (Delta, Gamma, Theta, Vega) 6. Implied Volatility / Volatility Smiles 7. Interest Rate Derivatives (Cap, Floor, European Styled Swaption) 8. Credit Default Swaps 			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of the major concepts, approaches and techniques in Derivative Analysis i.e. they can</p> <ul style="list-style-type: none"> • understand the use of derivatives • evaluate derivatives • understand the theoretical framework of derivative pricing <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply advanced knowledge to efficiently use financial derivatives, i.e. they can</p> <ul style="list-style-type: none"> • understand the pricing of derivatives using market data • create hedges using derivatives • interpret capital market products <p><i>Competence:</i> On successful completion of this module, students can take responsibility to transfer these concepts to typical management situations in banks, such as Treasury, Sales and Trading.</p>								
Forms of teaching, methods and support	Lecture, discussion, computer simulations, case studies and questions								
Type of Assessment(s) and performance	<table border="1" data-bbox="480 1115 1378 1249"> <thead> <tr> <th data-bbox="480 1115 703 1193">Type of examination</th> <th data-bbox="703 1115 927 1193">Duration or length</th> <th data-bbox="927 1115 1150 1193">Performance Points</th> <th data-bbox="1150 1115 1378 1193">Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td data-bbox="480 1193 703 1249">Written exam</td> <td data-bbox="703 1193 927 1249">120 min</td> <td data-bbox="927 1193 1150 1249">120</td> <td data-bbox="1150 1193 1378 1249">Exam week</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Written exam	120 min	120	Exam week
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Written exam	120 min	120	Exam week						
Recommended Literature	<ul style="list-style-type: none"> • John C. Hull: Options, Futures and other Derivatives, Prentice Hall International 8th Edition 2012 • Hans R. Stoll / Robert E. Whaley: Futures and Options, South Western Publishing Cincinnati 1993 • Additional material will be available on Canvas 								
Module Structure	Students will focus on understanding the use of derivative products, gaining a theoretical understanding of forwards and options, learn to analyse and calculate hedges and how to implement these with Excel.								
Usability in other Modules/Programmes	Other modules in Capital Markets concentration; Master's Thesis								
Last Approval Date	2020/03/12								

Derivatives for Corporate Finance [FIN76380-1565946423341]

Module Coordinator		Heidorn, Thomas			
Programme(s)		MSc MF			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Financial Products & Modelling			
Content		<ol style="list-style-type: none"> 1. Forward and future contracts 2. Hedging with interest rate swaps 3. FX hedging 4. Black/Scholes vs. Cox / Ross / Rubinstein 5. Stock Options and Currency Options 6. Understanding Greeks (Delta, Gamma, Thea, Vega) 7. Implied volatility / volatility smiles 8. Hedging with interest rate derivatives (Cap, Floor, European styled Swaption) 9. Credit default swaps 			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of the major concepts, approaches and techniques to use derivatives for corporate hedging i.e. they can:</p> <ul style="list-style-type: none"> • Understand the use of derivatives • Evaluate derivatives • Understand the hedging of corporate risks <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply advanced knowledge to efficiently use financial derivatives for corporate financial management, i.e. they can</p> <ul style="list-style-type: none"> • Understand the pricing of derivatives using market data • Create hedges for corporates using derivatives • Interpret financial risk positions for corporates <p><i>Competence:</i> On successful completion of this module, students can take responsibility to transfer these concepts to typical management situations in Corporate Treasury.</p>								
Forms of teaching, methods and support	Lecture, discussion, computer simulations, case studies and questions								
Type of Assessment(s) and performance	<table border="1" data-bbox="480 1115 1378 1249"> <thead> <tr> <th data-bbox="480 1115 703 1193">Type of examination</th> <th data-bbox="703 1115 927 1193">Duration or length</th> <th data-bbox="927 1115 1150 1193">Performance Points</th> <th data-bbox="1150 1115 1378 1193">Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td data-bbox="480 1193 703 1249">Written exam</td> <td data-bbox="703 1193 927 1249">120 min</td> <td data-bbox="927 1193 1150 1249">120</td> <td data-bbox="1150 1193 1378 1249">Exam week</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Written exam	120 min	120	Exam week
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Module Structure	Students will focus on understanding the use of derivative products, gaining a theoretical understanding of forwards and options, learn to analyse and calculate hedges and how to implement these with Excel. The course focuses on financial management from a treasury perspective.								
Usability in other Modules/Programmes	Other modules in Corporate Finance Concentration								
Last Approval Date	2020/02/28								

Financial Information & Decision-Making
[MGT72032-1565946861456]

Module Coordinator		Lent, Laurence			
Programme(s)		MSc MF			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Basic knowledge of preparing and interpreting financial statements and basic knowledge of statistics (regression analysis).			
Content		<p>Lecture 1: Introduction</p> <p>Part I: Financial Reporting Quality Lecture 2: Earnings management Lecture 3: Accounting conservatism Lecture 4: Disclosure decisions</p> <p>Part II: Decision-making uses of financial information Lecture 5: Equity markets Lecture 6: Debt contracts and covenants Lecture 7: Executive compensation Lecture 8: Information intermediaries (press and financial analysts) Lecture 9: Regulators</p> <p>Part III: STATA workshop Lecture 10: Data collection, variable calculation and descriptive statistics Lecture 11: Correlations and linear regressions</p>			

<p>Intended Learning Outcomes</p>	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of the state of the art theories of modern financial accounting, i.e. they can:</p> <ul style="list-style-type: none"> • Explain the concept of decision usefulness in financial accounting • Summarize how the use of accounting information in contracts may affect accounting quality • Describe the methods used in accounting research to measure financial reporting quality • Describe how accounting research can be useful to professionals (managers, controllers, auditors, and regulators) <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply advanced knowledge and relate pertinent concepts, i.e. they can:</p> <ul style="list-style-type: none"> • Use state-of-the-art techniques to measure financial reporting quality • Evaluate how financial reporting quality affects decision making on equity and debt markets and in compensation contracts • Collect and statistically analyze financial and market data • Write algorithms in STATA <p><i>Competence:</i> On successful completion of this module, students can take responsibility to transfer theoretical concepts to typical leadership, management and consulting situations, i.e. they can:</p> <ul style="list-style-type: none"> • Guide decision-making based on financial data • Appraise the role of using accounting information in contracts • Demonstrate effective presentation skills on research findings 																
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Type of examination	Duration or length	Performance Points	Due date or date of exam														
Presentations, in-class assignments, participation	TBD	20	During the module														
Replication task	2 pages written report	40	During the module														
Written exam	60 min	60	Exam week														

Recommended Literature

- *Reading list:*

We do not use a required textbook in this course (for reasons to be explained during the first lecture). However, students might find it useful to review some of the concepts discussed during the lectures (in a more leisurely fashion) by reading the suggested chapters from:

Scott, W., 2009, *Financial Accounting Theory*, Pearson Prentice Hall, Toronto, any edition from the 5th.

Note that this book is only suggested background reading and not mandatory for the exam. The exam will be based on the assigned papers and the lecture notes.

- Watts, R., G. Zimmerman (1990) Positive Accounting Theory: A Ten Year Perspective. *The Accounting Review* 65: 131-156.
- Nichols, D. and Wahlen J. (2004) How do earnings numbers relate to stock returns? A review of classic accounting research with updated evidence, *Accounting Horizons*, 18: 263-286.
- Burgstahler, D., I. Dichev (1997) Earnings Management to Avoid Earnings Decreases and Losses. *Journal of Accounting and Economics* 24: 99-127.
- Healy P and J. Wahlen (1999) A review of the earnings management literature and its implications for standard setting, *Accounting Horizons* 13: 365-383.
- Basu, S. (1997) The Conservatism Principle and the Asymmetric Timeliness of Earnings. *Journal of Accounting and Economics* 24: 3-37.
- Watts, R.L. (2003) Conservatism in accounting part I: Explanations and implications. *Accounting Horizons*, 17: 207-221. / Watts, R.L. (2003) Conservatism in accounting part II: Evidence and research opportunities. *Accounting Horizons*, 17: 287-301.
- Healy, P. and K. Palepu (2001) Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature, *Journal of Accounting and Economics* 31(1-3), 405-440.
- Lang, M., and R. Lundholm (1996) Corporate Disclosure Policy and Analyst Behavior. *The Accounting Review*, 71: 467-492.
- Ball, R., P. Brown (1968) An Empirical Evaluation of Accounting Income Numbers. *Journal of Accounting Research* 6: 159-177.
- Beaver, W., (1968) The Information Content of Annual Earnings Announcements. *Journal of Accounting Research* 6: 67-92.
- Francis, J., R. LaFond, P. Olsson, and K. Schipper (2004) Costs of Equity and Earnings Attributes. *The Accounting Review* 79: 967-1010.

	<ul style="list-style-type: none"> • Christensen H., V. Nikolaev, R. Wittenberg-Moerman, (2016) Accounting Information in Financial Contracting: The Incomplete Contract Theory Perspective. <i>Journal of Accounting Research</i>, 54 (2), 397-435. • Bharath, S., J. Sunder, and S. Sunder (2008) Accounting Quality and Debt Contracting. <i>The Accounting Review</i> 83: 1-28. • Indjejikian, R. (1999) Performance evaluation and compensation research: an agency perspective. <i>Accounting Horizons</i> 13(2): 147-157. • Bushee, B., J. Core, W. Guay, and S. Hamm (2010) The Role of the Business Press as an Information Intermediary, <i>Journal of Accounting Research</i> 48: 1-20. • Barth, M., W. Landsman, and M. Lang (2008) International Accounting Standards and Accounting Quality, <i>Journal of Accounting Research</i> 46: 467-498. • Lawrence, A., J. Ryans, E. Sun (2017) Investor demand for sell-side research, <i>The Accounting Review</i> 92(2): 123-149. • Correia, M (2014) Political Connections and SEC Enforcement, <i>Journal of Accounting and Economics</i> 57: 241-262.
Module Structure	
Usability in other Modules/Programmes	Other modules in Financial Advisory Concentration.
Last Approval Date	2020/03/11

Marketing Strategy [MGT73720]

Module Coordinator		Worm, Stefan			
Programme(s)		MSc MiM			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Concentration Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Marketing and Statistics.			
Content		<p>Marketing Strategy Formulation</p> <ul style="list-style-type: none"> • Foundations of marketing strategy • Analysing the market • Challenges of marketing analytics • Segmentation, targeting, and positioning • Formulating, evaluating, and selecting marketing strategies <p>Marketing Strategy Implementation</p> <ul style="list-style-type: none"> • Innovation management • Customer relationship management • Brand management • Managing distributor relationships 			

<p>Intended Learning Outcomes</p>	<p>When you successfully complete this course, you should be able to understand and be able to apply data-driven decision-making for marketing strategy formulation and implementation. In particular, you should:</p> <p><i>Knowledge</i> Understand the key marketing concepts and frameworks: Customer-perceived value, competitive advantage, brand equity, customer relationships (customer satisfaction, customer equity, CLV), distribution network, market orientation, market intelligence, marketing capabilities, innovation, communication, market performance. Understand the marketing-value chain, linking marketing actions and assets to financial performance. Understand the function of the key instruments available to marketers: STP, customer relationship management, branding, innovation, marketing intelligence.</p> <p><i>Skills</i> Structure marketing problems and business decisions using the key marketing concepts and frameworks. Describe and analyse the characteristics of a specific market using data on environment, customers, and competitors (Marketing Intelligence) Develop and formulate a marketing strategy based on a consideration of firm resources and market opportunities using the STP approach. Establish chains of effect linking actions, causes, and outcomes in marketing management. Develop a basic command of the most common marketing metrics used to quantify and measure marketing concepts and actions. Estimate the potential financial consequences of strategic marketing decisions by quantifying the links among the various marketing actions and concepts.</p>																				
<p>Forms of teaching, methods and support</p>	<p>The present course combines lectures, numerical online tutorials, and a consulting class project. Classroom sessions will comprise a mix of lecture, case discussion, mini-breakout exercises, and tutorials. In addition, we will have time in the classroom for the consulting project.</p>																				
<p>Type of Assessment(s) and performance</p>	<table border="1"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance Points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td>Class project</td> <td>Approx. 10 + 15 mins. presentation</td> <td>50</td> <td>During the module</td> </tr> <tr> <td>Online tutorials</td> <td>6 x 150 mins.</td> <td>30</td> <td>During the module</td> </tr> <tr> <td>Class participation</td> <td>In class</td> <td>20</td> <td>During the module</td> </tr> <tr> <td>Written exam</td> <td>20 mins.</td> <td>20</td> <td>Exam week</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Class project	Approx. 10 + 15 mins. presentation	50	During the module	Online tutorials	6 x 150 mins.	30	During the module	Class participation	In class	20	During the module	Written exam	20 mins.	20	Exam week
Type of examination	Duration or length	Performance Points	Due date or date of exam																		
Class project	Approx. 10 + 15 mins. presentation	50	During the module																		
Online tutorials	6 x 150 mins.	30	During the module																		
Class participation	In class	20	During the module																		
Written exam	20 mins.	20	Exam week																		

Recommended Literature	<p><i>Marketing Strategy: Based on First Principles and Data Analytics.</i> Palmatier and Shridhar.</p> <p><i>Key Marketing Metrics: The 50+ metrics every manager needs to know.</i> Farris, Bendle, Pfeifer, Reibstein. Other readings for each topic will be provided.</p>
Module Structure	Classroom sessions and online tutorials are scheduled throughout the semester. The consulting project will kick off with a briefing when the course starts and concludes with the final presentation towards the end of the course.
Usability in other Modules/Programmes	Other marketing modules; Strategy Concentration; Marketing Concentration.
Last Approval Date	2020/03/09

Predictive Analytics [MGT73770]

Module Coordinator		Strohhecker, Jürgen			
Programme(s)		M.Sc. MiM			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Concentration Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Operations Management, Statistics			
Content		<p>In this module, students will learn discrete event modelling and simulation techniques DES (as one important tool in the predictive analytics toolbox) to solve a range of management challenges, specifically in operations. These challenges are drawn from various areas including process design, supply chain management, scheduling, supply and demand planning, and project management.</p> <p>Students will learn how to develop stochastic models, analyse and provide empirical data, simulate their models, conducting Monte Carlo and “what if” simulations, analyse and interpret the stochastic results and communicate their findings to a management audience. Both general software packages (for example Microsoft Excel) and specific simulation software are used.</p> <p>By successfully passing this module participants will have the knowledge and tools at hand to conduct discrete event simulation based consulting projects.</p>			

<p>Intended Learning Outcomes</p>	<p>Knowledge: On successful completion of the module, the participants will have knowledge of the discrete event simulation technique as an important tool in the predictive analytics toolbox. They can</p> <ul style="list-style-type: none"> • describe this technique • explain and operate it • evaluate it and discuss strength and weaknesses <p>Skills: On successful completion of the module, students will have the proven ability to apply DES to practice-oriented challenges, i.e. they can</p> <ul style="list-style-type: none"> • analyse, structure and classify a range of management challenges in practice and theory • develop an adequate DES model and test it • analyse the model to solve a management challenge • use general software packages (for example Microsoft Excel) and specific simulation software (for example Arena) to support quantitative modelling <p>Competencies: Successful module participants develop the competence to provide responsible contributions addressing management challenges. Specifically they can</p> <ul style="list-style-type: none"> • present management challenges and models to a management audience • present model based results and scenarios to a management audience • argue competently about adequate problem solution strategies • present a structured project plan
<p>Forms of teaching, methods and support</p>	<p>Teaching format consists of interactive lectures, workshop-style lectures, self-study elements, exercises, modelling challenges and a small-scale practice project. Participants will often work in small groups with close interaction with the lecturer. Teaching builds on the idea that discrete event modelling is best acquired through learning by doing, i.e. through applying it to various hands-on challenges.</p>

Type of Assessment(s) and performance	Type of Assessment	Duration	Performance Points	Due Date
	Modelling and Simulation exam	90 min	40	Exam week
	Practice case study	30 min (20 h workload)	40	Last lecture
	Class participation (exercises and cases)	(10 h workload)	40	During the module
<p><u>Examination requirements:</u> For the modelling and simulation based examinations a computer running Windows 8 or higher will be needed. Discrete event simulation software will be provided. The modelling and simulation exam is an individual examination. The practice case study is a group work including a management oriented presentation of the findings. In-class participation consists of examinations of both group and individual contributions (i.e., to class discussion, modelling exercises, small-scale case preparation, etc.).</p>				
Recommended Literature	Kelton, W. David; Sadowski, Randall P.; Zupick, Nancy B.: Simulations with Arena, 6th ed: McGraw-Hill, 2014 Kelton, W. David; Smith, Jeffrey S.; Sturrock, David T.: Simio & Simulations, Modeling, Analysis, Applications, 2nd ed., McGraw-Hill, 2011			
Module Structure	<p>Session Content</p> <ol style="list-style-type: none"> 1 Introduction to Modelling and Simulation 2 The Process of Modelling and Simulation 3 Data analysis and model parameterisation 4 Comparing Process Designs 5 Processes with Interruptions and Multiple Resources 6 Planning a simulation based consulting project 7 Introduction to the practice case study 8 Analysis of model output and model validation 9 Modelling and analysing a newsvendor challenge 10 Advanced modelling concepts 11 Practice case study presentation 			
Usability in other Modules/Programmes	Master's Thesis			
Last Approval Date	2020/03/02			

**Restructuring & Strategic Management
Control [MGT72031-1565946861456]**

Module Coordinator		Mahlendorf, Matthias			
Programme(s)		MSc MF			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Foundations of Finance; Financial Statement Analysis			
Content		<p><i>“Even though the particular focus of restructuring may change over time—yesterday’s Internet crisis is tomorrow’s real estate/private equity/banking crisis—companies in general restructure for the same reasons: to improve their financial performance; to take advantage of new strategic opportunities; and to increase their market value through improved communication and enhanced credibility with investors, analysts, and other capital market participants. The many factors that trigger restructuring—competition, technological change, macroeconomic shocks, market volatility, taxes, regulation, and financial speculation—are omnipresent and cut across industries, countries, and time”</i> (S. C. Gilson, Harvard Business School)</p> <p>The module Restructuring & Strategic Management Control aims at analyzing firms in financial distress and developing solutions to improve profitability. The module will contribute to acquiring theoretical knowledge and practical applications about how financial and nonfinancial information is used in strategic and operational decision-making in turnarounds.</p>			

Intended Learning Outcomes	<p><i>Knowledge:</i> Students become acquainted with tools and techniques to evaluate the success of firms. Strategic profitability analysis, for example, reveals whether costs, revenues and growth are consistent with a chosen strategy.</p> <p>Having taken the course, students can:</p> <ul style="list-style-type: none"> • Explain various methods that help to understand the reasons for unprofitability and to improve the strategy • Illustrate how a company is managed after bankruptcy has been declared and • Specify how debt & liabilities, equity & assets, and employee claims can be restructured to allow a fresh start for the company <p><i>Skills:</i> Students learn to analyse complex situations of firms in distress and to develop suggestions for restructuring firms. On successful completion of this module, students can:</p> <ul style="list-style-type: none"> • Reconsider the business model • Manage turnaround activities • Assess the profitability on the corporate and business unit levels and • Select performance indicators which support the achievement of short and long-term objectives <p><i>Competence:</i> On successful completion of this module students will be prepared for a career in consulting firms, the financial advisory task of audit firms, and more generally for executive positions in the finance function of medium sized and large corporations. Students become qualified to:</p> <ul style="list-style-type: none"> • Develop solutions in challenging financial situations • Reposition the strategy of a firm based on the analysis of financial and nonfinancial data 												
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Case presentation/Simulation/Quizzes	TBD	60	During the module										
Written exam	60 min	60	Exam week										
Recommended Literature													
Module Structure													
Usability in other Modules/Programmes	-												
Last Approval Date	2020/01/31												

Risk Governance & Organisation [FIN71430]

Module Coordinator		Hartenstein, Stephan			
Programme(s)		MSc MF			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Risk Management core module			

Content

This module looks at the key elements to successfully managing all risks found in financial institutions, where it is made clear that each financial institution has a unique risk profile depending on its business, its risk appetite and risk bearing capacity. However, it is also made clear that all risk management systems established at a financial institution look similar in the sense that they all face similar or comparable risks and should establish an overall risk management framework. Such framework will be looked at by decomposing it into its five elements strategy, infrastructure, process, policies / guidelines and risk culture. Thereby, the importance of the establishment of adequate segregation of duties and an appropriate risk culture next to technical processes and tools is underlined.

To illustrate the usefulness of risk management, the value added and advantages to be expected are explained – and the issues that may confront a financial institution when neglecting its risk management activities.

All of this will be looked at with the main types of risk found in financial institutions: credit risk, market risks, counterparty risk, liquidity risk, operational risks. However, focus will always remain on organisation and governance, but not on risk models for more or less quantification of these risks.

1. Credit Risk

The seminar starts with a case study on credit risk, making course participants aware of what is required in a lending company to ensure unwanted credit risk will not bring the company to an unwanted ending. We will work out the main elements of a framework for Credit Risk Management covering strategy, infrastructure, process, policy and risk culture. The main steps of a combined lending and credit risk management process will be focus of this module, including basic considerations for product development and definition of target clients, client analysis, client classification, guarantee requirements, the decision process, authority schedules, lending controls and loan portfolio management. The module then elaborates the concept of an early warning system for the early identification of problems and also presents best practice approaches for problem loan management and credit risk reporting. The module will link with credit risk quantification as presented in the “Risk Management” module and introduce the concept of a Post Mortem Analysis to learn from defaulted loans.

2. Market Risk (FX and IR Risk)

Part 2 discusses the main Market Risks relevant to financial institutions: Foreign Currency Risk (FX) and Interest Rate Risk (IR). Again, related case studies will be looked at to see what can go wrong if these risks are not managed well. The framework components for managing these risks are then introduced and the process to manage each risk is described separately. Basic tools to identify and evaluate both FX and IR Risk are introduced and the concept of an Asset-Liability-Committee (ALCO) to practically manage Market Risks (and others) is presented. A crossover is thereby made to a later module, Liquidity Risk Management.

3. Counterparty Risk

This part covers the main aspects of counterparty risk, which is presented as a special case of credit risk that financial institutions enter into when executing financial transactions with others. The module will introduce participants to the main process steps for this risk management activity (analysis and selection of counterparties, approval of counterparties and exposures, exposure calculation and limit monitoring, maintenance of an approved counterparty list) and explain how this risk function should be organized. The module will include the main aspects of related changes as per Basel III.

4. Liquidity Risk

Following the discussion of Market Risks this part covers a related risk category, which is Liquidity Risk. This module provides an overall introduction to this risk, how it is created in a financial institution and how it can be dealt with. It will distinguish between short-term repayment risk and long term funding risk. A basic tool and indicators for the measurement and monitoring of Liquidity Risk will be introduced. Again, a case-study approach is taken to find a practical entry to the topic. The module closes by reverting once more to the concept of an Asset-Liability-Committee (ALCO) to practically manage Market Risks and Liquidity Risk.

5. Operational Risk

This part is dedicated to the introduction to Operational Risk Management. It includes a discussion of the standard categories of operational risk (inadequate or failed internal processes, people, fraud, compliance and systems, external events) and suggested standards for managing these. Model Risk and reputational risk will also be covered.

The part furthermore presents best practice processes and tools for managing operational risks. This will include Operational Risk Assessments as a key instrument to identify and assess Operational Risks and to generate a risk map, the concept of a “New Risk Approval” process to manage risks of new business activities, the definition and use of Key Risk Indicators as an early warning system for operational risks and a risk event management process using a risk event database to ensure risk events / risk incidents are handled professionally.

The view on Operational Risk Management is enlarged by clarifying the fundamental difference of the role of Internal Audit, Internal Control and the role and process of Operational Risk Management. In this context, the “Three Lines of Defense” model will be presented and special functions like Fraud Prevention, Compliance and Information Security are introduced and discussed.

6. Risk Governance

After introducing the main features of Corporate Governance, a link is made to the Risk Management Framework presented in the preceding modules of this seminar. The overlap of Corporate Governance with Risk Management is defined as Risk Governance and the main functionalities

and tasks are explained. Focus is put on the responsibilities of the Board, Management and Risk Management.

This topic also includes the main considerations about how to establish and maintain an appropriate **risk culture** in a financial institution.

The part closes with a summarising view on integrated performance and risk management and a discussion on the main success factors for implementing an effective risk management function in a financial organisation.

7. Risk Management Regulation

Looking at the regulations on risk management as designed by the ECB provides insight into how regulators want banks to implement risk management and the benchmark regulators apply themselves when supervising banks. The module will take a brief look at the history of Basel recommendations and take a closer look at how these have been translated into the regulatory framework of the ECB. The module will also look at the regulatory stress testing exercised by the ECB.

<p>Intended Learning Outcomes</p>	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough understanding of risk governance and organisation, i.e. they can:</p> <ul style="list-style-type: none"> • Develop the components of a risk management framework in a financial institution • Explain the main prerequisites for a successful risk management organisation • Examine the mutual impact of corporate governance organisation, process and resources with risk management • Illustrate the functioning of financial regulation • Describe how all these factors are an integral part of steering and managing a financial institution <p><i>Skills:</i> On successful completion of this module, students will have the ability to apply their advanced knowledge on risk governance effectively, i.e. they can:</p> <ul style="list-style-type: none"> • Support the achievement of business objectives through the effective and efficient set-up of a risk management framework • Effectively and appropriately utilize technical skills acquired during other modules in a risk management context and with regard to all risk management categories, from Credit Risk to Operational risk (Risk Assessments, Problem Loan Management, Liquidity Oversight Tables, VaR and other quantification models, New Risk Approvals, Risk Event Management, Risk Awareness Training, etc.) <p><i>Competence:</i> On successful completion of this module, students will have the competence to access gained abilities in a business setting, i.e. they can:</p> <ul style="list-style-type: none"> • Review existing set-ups in financial institutions identifying shortcomings in terms of risk management organization, process and culture • Develop enhancements for existing risk management frameworks at financial institutions, with the objective of establishing a risk management system that best fits the institution’s current set up and future requirements • Support management of the risk management function in a financial institution 																
<p>Forms of teaching, methods and support</p>	<p>Interactive presentation, case studies, sample tools, rehearsal quizzes during term, reading list, papers and presentations by students.</p>																
<p>Type of Assessment(s) and performance</p>	<table border="1"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance Points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td>Class participation</td> <td>throughout the module</td> <td>15</td> <td>During the module</td> </tr> <tr> <td>Case presentation</td> <td>30 min</td> <td>60</td> <td>During the module</td> </tr> <tr> <td>Written exam</td> <td>45 min</td> <td>45</td> <td>Exam week</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Class participation	throughout the module	15	During the module	Case presentation	30 min	60	During the module	Written exam	45 min	45	Exam week
Type of examination	Duration or length	Performance Points	Due date or date of exam														
Class participation	throughout the module	15	During the module														
Case presentation	30 min	60	During the module														
Written exam	45 min	45	Exam week														

Recommended Literature
Credit Risk Management

- Christian Bluhm, Ludger Overbeck, Christoph Wagner, Chapman & Hall 2003, An Introduction to Credit Risk Modeling, Chapter 1
- Bank for International Settlements, Basel 2006, Sound credit risk assessment and valuation for loans at <http://www.bis.org/publ/bcbs126.htm>
- Bank for International Settlements, Basel 2000, Principles for the Management of Credit Risk at <http://www.bis.org/publ/bcbs75.htm> (suggested for translation)

Market Risk

- Diamantini, S., A Primer on Currency Risk Management for Microfinance Institutions, J.P. Morgan Chase & Co., January 2010, found on <http://www.microfinancegateway.org/library/primer-currency-risk-management-microfinance-institutions>
- Basel Committee on Banking Supervision, July 2004, Principles for the Management and Supervision of Interest Rate Risk
- Committee of European Banking Supervisors (CEBS), March 2006, Consultation paper on technical aspects of the management of interest rate risk arising from nontrading activities and concentration risk under the supervisory review process
- Oesterreichische Nationalbank, 2008, Guidelines on Managing Interest Rate Risk in the Banking Book
- Interest rate risk in the banking book, bcbs April 2016: <http://www.bis.org/bcbs/publ/d368.htm>

Liquidity Risk

- Basel Committee on Banking Supervision, January 2013, Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools at <http://www.bis.org/publ/bcbs238.htm>
- Basel Committee on Banking Supervision, September 2008, Principles for Sound Liquidity Risk Management and Supervision at <http://www.bis.org/publ/bcbs144.htm>
- Comptroller of the Currency / Administrator of National Banks, June 2012, Comptroller's Handbook – Liquidity at <http://www.occ.gov/publications/publications-by-type/comptrollers-handbook/liquidity.pdf>

Operational Risk

- Bank for International Settlements, Basel 2014, Review of the Principles for the Sound Management of Operational Risk at <http://www.bis.org/publ/bcbs292.htm>
- IIA Position Paper: THE THREE LINES OF DEFENSE IN EFFECTIVE RISK MANAGEMENT AND CONTROL, JANUARY 2013 available on <https://na.theiia.org/standards-guidance/recommended-guidance/Pages/Position-Papers.aspx> Detailed Loss Event Type Classification in Annex 9 of the Basel II framework at www.bis.org/publ/bcbs128.pdf

	<ul style="list-style-type: none"> • Bank for International Settlements, Basel 2014, Sound management of risks related to money laundering and financing of terrorism at http://www.bis.org/publ/bcbs275.htm • Bank for International Settlements, Basel 2005, Compliance and the compliance function in banks at http://www.bis.org/publ/bcbs113.htm <p>Risk Governance</p> <ul style="list-style-type: none"> • “Principles for enhancing corporate governance”, Basel Committee on Banking Supervision, Basel, 2010 • Bank for International Settlements (2015). Guidelines - Corporate Governance Principles for Banks. Basel Committee on Banking Supervision, Basel, Switzerland • OECD (2004). Principles of Corporate Governance. OECD, Paris, France <p>Regulations</p> <ul style="list-style-type: none"> • Minimum Requirements for Risk Management at German banks (MaRisk) at https://www.bafin.de/SharedDocs/Downloads/DE/Rundschreiben/rs_1709_MaRisk_english.html?nn=9021442 • ECB Guide to banking supervision at https://www.ecb.europa.eu/pub/pdf/other/ssmguidebankingsupervision201409en.pdf?85e39f5cf761e11147f6e828cd4088b1
Module Structure	<p>The module is subdivided into 7 parts.</p> <ul style="list-style-type: none"> • Five parts will discuss organisational and process requirements for each main risk category • One part will focus on risk governance and the success factors for the implementation of risk management within a financial institution's corporate governance framework • The module includes case studies on risk governance and risk management failures • The seventh and last part describes how risk management is defined by regulators. Focus will be put on the supervisory process of the ECB
Usability in other Modules/Programmes	Other modules in Risk Management Concentration
Last Approval Date	2020/02/28

Scaling Digital Businesses [MGT71777]

Module Coordinator		Giustiziero, Gianluigi			
Programme(s)		MSc MiM			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		None			
Content		<p>In 1965, Gordon Moore proposed that the number of transistors on a silicon chip would double every year. Since then, Moore's Law has been delineating the superlinear scaling of technological development, an exponential progress so spectacular as to lead to a radical transformation of the economy and to the emergence of hyperscalers such as Google, Uber, Microsoft, and Amazon. The Scaling course sheds light on these trends, examining some of the different and far-reaching ways technology is shaping the modern organization. It provides a unique blend of theory and practice, applying concepts from the world of technology, where venture capitalists, entrepreneurs, and managers alike discuss the strategies of technology firms in terms of scaling laws (such as Moore's Law). At the end of the course, you will be brought up to speed with the "Silicon Valley way" of doing business and with the novel techniques for strategic decision-making that are necessary to navigate the modern economy.</p>			

Intended Learning Outcomes	<p>The objectives for the course are as follows:</p> <ol style="list-style-type: none"> 1. Understand the implications of digital technologies on strategy. 2. Understand how digital technologies affect environmental forces and strategic interactions between firms and their competitors. 3. Become proficient in analytical and critical thinking; develop skills in reporting conclusions effectively in written and oral form. <p><i>Knowledge:</i> Apply the principles of strategic decision-making to the digital economy.</p> <p><i>Skills:</i> Expand and elaborate on traditional tools to examine the new business models of the digital economy.</p> <p><i>Competence:</i> Critical, creative, and data-driven thinking; ability to understand and use novel strategies in the digital economy.</p>																
Type of Assessment(s) and performance	<table border="1"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance Points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td>Class participation</td> <td></td> <td>24</td> <td>During the semester</td> </tr> <tr> <td>Assignments (Strategy)</td> <td>Tbd</td> <td>36</td> <td>During the semester</td> </tr> <tr> <td>Written exam</td> <td>Tbd</td> <td>60</td> <td>During the exam week</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Class participation		24	During the semester	Assignments (Strategy)	Tbd	36	During the semester	Written exam	Tbd	60	During the exam week
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Class participation		24	During the semester														
Assignments (Strategy)	Tbd	36	During the semester														
Written exam	Tbd	60	During the exam week														
Recommended Literature	<ul style="list-style-type: none"> • The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies by E. Brynjolfsson and A. McAfee • Platform Revolution: How Networked Markets are Transforming the Economy - and How to Make Them Work for You G. Parker, M.W. van Alstyne, and S.P. Choudary • Blitzscaling: The Lightning-Fast Path to Building Massively Valuable 																
Module Structure																	
Usability in other Modules/Programmes	-																
Last Approval Date	2020/05/19																

Supply Chain Strategy [MGT73750]

Module Coordinator		Kremer, Mirko			
Programme(s)		MSc MiM			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Concentration Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Business Statistics; Operations Management			
Content		<p>Supply chains are networks of organizations (suppliers, manufacturers, distributors, retailers) that jointly supply and transform materials, and distribute products and services to consumers. If designed and managed properly, these networks are a crucial source of competitive advantage for both manufacturing and service enterprises. Each day, world-class companies such as Amazon, Apple, Dell, and Zara try to leverage their supply chain management (SCM) capabilities to achieve profitable growth far ahead of their competition. This module develops a framework of Supply Chain drivers, that helps students understand the implications of a firm's supply chain strategy on its financial performance.</p> <p>Importantly, this module addresses the idea of Supply Chain tailoring: what is the right supply chain strategy for one product (say, diapers), may well be the wrong strategy for another (say, fashionable shoes).</p>			

<p>Intended Learning Outcomes</p>	<p>Knowledge: On successful completion of this module, students will have an in-depth understanding of supply chain strategy and financial performance, e.g. they can:</p> <ul style="list-style-type: none"> • Describe how Supply Chain Strategy contributes to the financial performance of companies across a wide range of industries • Understand the importance of aligning business strategy and supply chain design • Realize the value and limitations of key concepts such as quick response, risk pooling, and risk sharing via contracts. <p>Skills: On successful completion of this module, students will have the proven ability to apply knowledge and concepts learned to the supply chain strategy and financial performance context, e.g. they can:</p> <ul style="list-style-type: none"> • Develop and advance spreadsheet modeling • Support qualitative arguments with solid quantitative analysis through these spreadsheet modeling skills • Apply basic models to make decisions regarding distribution strategies or • Evaluate the performance of different means for coordinating and sharing risk across company borders. <p>Competencies: On successful completion of this module, students can take responsibility to transfer the learned concepts to real world situations pertaining to typical supply chain strategy and financial performance, e.g. they can:</p> <ul style="list-style-type: none"> • Use a structural framework of key performance drivers that explain and predict the success and failure of modern supply chains • Present supply chain management challenges to a broad audience • Argue competently about problem solution strategies
<p>Forms of teaching, methods and support</p>	<p>The course is taught interactively. A considerable number of exercise tasks and discussion questions are used to train participants. Case studies and simulation games help to improve the learning experience. Participants are expected to cover the course contents by preparation and follow-up work as well as undertaking a number of the tasks in their own study time.</p>

Type of Assessment(s)
and performance

Type of Examination	Duration or length	Performance Points	Due date or date of exam
Class participation	Continuous	20	Throughout the module
Case study quizzes	TBA	20	During the module
Technical exercises	TBA	20	During the module
Corporate project - presentation & write-up	TBA	20	Sessions 10 & 11
Written exam	40 mins.	40	Exam week

Class participation.

You can earn credit towards your class participation score by a) contributing to our in-class discussion (of case studies etc.) and b) engaging in an online discussion forum on contemporary topics. 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 me a note if you cannot come. Mostly, our discussions will be free form: anyone who has something to contribute can and should. If you have worked in the industry of the case study or come across a similar issue to the one discussed in the case, I encourage you to share your experience. The greatest learning experience often comes from comparing the learning points of a case to industry practice.

Students will be evaluated on the quality of the contributions (not the quantity).

Case Quizzes

To ensure a rich in-class discussion, you are expected to read and analyse all cases before class. For all cases, you should complete a short quiz, and submit your top two recommendations related to the case with a concise but compelling justification for each; 2-3 short sentences per recommendation including justification. Clearly you cannot provide detailed recommendations or justifications in such short space; you should imagine you have 30 seconds in the elevator with the CEO (or whoever the case protagonist is), during which time you need to spark his or her interest enough to get you a follow-up appointment to go into more detail. You may choose which five cases to do. Your answers will be graded. For each case, you will earn points, based on a combination of your answers to the quiz and your recommendations. You may be called on in class to explain and defend the recommendations you submit.

Technical Exercises

These exercises are small-scale, and mostly technical in nature (most require Excel spreadsheet modeling), with a few creative thinking questions attached to some of them. The exercises are designed to further the students' intuition for some of the concepts discussed in class.

	<p>Furthermore, the exercises should prove useful as a stepping stone towards the analyses required for some of the group case assignments. Throughout the course, I will assign a number of these exercises, and will make sure that there is ample time to work on them.</p> <p>Corporate Project In collaboration with an industry partner, we will organise a “corporate challenge” that requires students to apply the concepts and tools learned in class towards a real-world problem. The main deliverables are a group presentation and a short “executive” write-up of the main conclusions and recommendations.</p> <p>More details will be given at the beginning of the course.</p> <p>Final Exam More details will be given at the beginning of the course.</p>
Recommended Literature	<p>The following textbook provides most of the methodological backbone of this class:</p> <p>Chopra and Meindl: Supply Chain Management: Strategy, Planning, and Operation, 6th edition, McGrawHill, 2014 (only selected chapters)</p> <p>The textbook can be found in the FS library in reasonable numbers.</p> <p>All other course materials (slides, quizzes, assignments, tutorials, case studies) will be distributed electronically on Canvas.</p>
Module Structure	<p>With a more detailed break-down to follow at the beginning of class, the contents of the module are built up as follows:</p> <ol style="list-style-type: none"> A. Developing a Framework of Supply Chain Performance Drivers B. Mitigating Risk in Supply Chains: Quick Reponse C. Mitigating Risk in Supply Chains: Risk Pooling D. Designing Supply Chain Networks E. Coordinating and Sharing Risk across the Supply Chain F. Supply Chains in the Wild: Corporate Project
Usability in other Modules/Programmes	Master's Thesis
Last Approval Date	2020/03/09

Equity Finance [FIN75380]

Module Coordinator		Umber, Marc			
Programme(s)		MSc MF			
Term		Semester 3 Q1			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Principles or Foundations of Finance; Corporate Finance; Intermediate level Excel modelling skills; Familiarity with key concepts of Accounting;			
Content		<p>The objective of this module is to develop students' appreciation of the aspects of equity financing throughout the lifecycle of a company. The rules of fundraising and contracting change as companies grow from early stage to being a mature company. Understanding the dynamics between various types of investors (angels, VC, PE, public) and entrepreneurs, and also the practicalities of raising VC and PE funds from institutional investors are key for adequate funding. The private equity industry has grown from approximately \$500 billion in assets under management in 2000 to over \$2.5 trillion in 2017. Growth by established firms and new entrants has outstripped transaction volume, resulting in substantial competition for deals. Excess money does not always create better economic outcome, and given the long investment horizons in VC and PE, it takes some time to reveal who is actually paying for bad funding decisions.</p>			

Intended Learning Outcomes	<p>To familiarise students with the practicalities of venture capital and private equity, and their investment process.</p> <p>Knowledge: On successful completion of this module, students will have an in-depth understanding of different types of equity financing, e.g., they will be able to:</p> <ul style="list-style-type: none"> - Understand the varying needs of equity funding throughout the life cycle - Understand structures of institutional equity investors - Explain the concepts of venture capital and private equity investments <p>Skills: On successful completion of this module, students will have the ability to:</p> <ul style="list-style-type: none"> - Evaluate venture capital and private equity investment targets <p>Competence: On successful completion of this module, students can take responsibility to transfer the knowledge and practiced methods in equity financing to real world situations, e.g. they can:</p> <ul style="list-style-type: none"> - Explain the concepts and techniques of equity financing - Identify adequate terms for equity contracting according to the company's stage - Compare and contrast the different types of equity investors
Forms of teaching, methods and support	Lectures, case work and team project.
Type of Assessment(s) and performance	-
Recommended Literature	Lecture slide sets, student's notes and selected chapters of: <ul style="list-style-type: none"> • Cumming, Johan, 2013. Venture Capital and Private Equity Contracting. Elsevier • Zeisberger, Prah, White, 2017. Mastering Private Equity: Transformation via Venture Capital, Minority Investments and Buyouts. Wiley • Metrick, Yasuda, 2010. Venture Capital and the Finance of Innovation. Wiley
Module Structure	This course contains both the theoretical foundations of equity finance, and real-life examples of equity investments. Focus of this module is the company and its need for (external) equity funding, and the complex and far reaching opportunities and threats for stakeholders (entrepreneurs, investors, potential investors).
Usability in other Modules/Programmes	Other modules in Corporate Finance Concentration
Last Approval Date	2019/05/08

Advisory Project [ACC71420]

Module Coordinator		Werner, Jörg R.; Linnebank, Ulrich			
Programme(s)		MSc MF			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Concentration Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	24 h	Independent Learning:	126 h
Prerequisites		Financial Statement Analysis, M&A Accounting, Restructuring & Strategic Management Control			
Content		The Advisory Project module has two parts. The first introduces the consulting business and provides practical knowledge such as how to successfully pitch and manage projects. The second part is a consulting challenge: Students will learn about a real world problem and are asked to develop a proposal under time constraints and to pitch their idea to senior managers.			

<p>Intended Learning Outcomes</p>	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of consultancy as a helping relationship which is provided upon expertise and experience by individuals leveraging their own expertise and experience together with the collective expertise, experience and assets of an advisory firm, i.e. they can:</p> <ul style="list-style-type: none"> • Define the business case of consulting/advisory (business model, career paths, organisation) • Summarise the key success factors for consulting projects • Describe potential ethical issues • Describe techniques to define, sell and manage projects <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply advanced knowledge and relate pertinent concepts, i.e. they can:</p> <ul style="list-style-type: none"> • Analyse a given practical problem • Assess different solutions for a problem • Demonstrate skills to work under time constraints • Pitch projects to peers and clients <p><i>Competence:</i> On successful completion of this module, students can take responsibility to transfer theoretical concepts to typical consulting situations, i.e. they can:</p> <ul style="list-style-type: none"> • Organise team work • Influence team members and decisions of clients • Appraise initiative and flexibility • Communicate efficiently
<p>Forms of teaching, methods and support</p>	<p>The module serves as the concentration's capstone project and combines delivery of knowledge through interactive class sessions (by faculty and senior professionals) and by working on real world cases, requiring students to work in teams and manage themselves under time constraints. Faculty stands ready to support the teams while they work on their cases upon request. The module culminates in team presentations.</p>

Type of Assessment(s) and performance	Type of examination	Duration	Performance points	Due date
	Pre-analysis	During the module	30	During the module (as announced in class)
	Final presentation	During the module	60	During the module (as announced in class)
	Oral exam	N/A	30	End of the module

Pre Analysis
This assignment assures all group members understand the case and the specific problem to be solved within the block week. Each student in each group works on one out of a set of analytical questions related to the case. Required output to be filed at due date: (1) 1-2 slides per student; (2) 2-3 pages of documentation accompanying the slide set; (3) 1-2 question(s) to be asked to the business partner in the Q&A session taking into account the case description. Individual grading for each student.

Final Presentation
The final presentation assures students are able (1) to apply their knowledge in a real world setting and (2) to present their solution in a challenging setting. 30 credits are assigned to the quality of the solution, 30 credits on how the solution is presented. Presentations are strictly limited to a maximum of 30 minutes plus 30 minutes “defense” / Q&A. Each group is free to make own decisions how their solution is presented and which materials are provided. Since this is a group effort, no individual grading takes place, because this assignment values team performance.

Recommended Literature	<ul style="list-style-type: none"> • Abrahamson, Eric (1996): Management Fashion. <i>Academy of Management Review</i>. 21(1): 254-285. • Exton, Jr., William (1982): Ethical and Moral Considerations and the Principle of Excellence in Management Consulting. <i>Journal of Business Ethics</i>. 1(3): 211-218. • Frankenhuis, Jean Pierre (1977): How to get a good consultant. <i>Harvard Business Review</i>. 55:6, 133-139. • Kaplan, Steven N.; Klebanov, Mark M.; Sorensen, Morten (2012): Which CEO Characteristics and Abilities Matter? <i>Journal of Finance</i>. 67(3): 973-1007. • Madsen, Dag Øivind; Slåtten, Kåre (2015): The Balanced Scorecard: Fashion or Virus? <i>Administrative Sciences</i>. 5: 2, 90-124. • Parikh, Samir (2015): <i>The Consultant's Handbook: A Practical Guide to Delivering High-value and Differentiated Services in a Competitive Marketplace</i>. John Wiley & Sons. • Verlander, Edward G. (2012): <i>The Practice of Professional Consulting</i>. John Wiley & Sons. • Turner, Arthur N. (1982): Consulting is more than giving advice. <i>Harvard Business Review</i>. 60(5), 120-129. • Zand, Dale E.; Sorensen, Richard E. (1975): Theory of Change and the Effective Use of Management Science. <i>Administrative Science Quarterly</i>. 20(4): 532-545. <p>[A full list of relevant literature is provided in the first session].</p>
Module Structure	<p>Prep Session Part 1: Introduction to the module, brief description of cases, assignment of cases to groups. Part 2: Consulting Practice Session #1</p> <p>Prep Period Students use the two weeks to get familiar with case, business partner & to identify questions for Q&A session with business partner and to prepare the pre-analysis assignment.</p> <p>Block week At the beginning of the block week, students have the opportunity to get in touch with the business partner and ask prepared questions. Groups independently work on cases and are supervised by mentors and faculty. Several slots for meetings with all students are assigned, including the following:</p> <ul style="list-style-type: none"> • Consulting practice session 2 • Consulting practice session 3 • Consulting practice session 4 • Dress rehearsals • Final presentation & get-together
Usability in other Modules/Programmes	Other modules in Financial Advisory Concentration and Master's Thesis

Last Approval Date	2020/03/16
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Case Studies in Investment Banking
[FIN77380-1565946423341]

Module Coordinator		Hirst, Simon			
Programme(s)		MSc MF			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Corporate Finance, Corporate Valuation			

Content	<p>This course is about the business of modern investment banking. As such, it covers all important business areas that arise in investment banking practice, ranging from M&A / Private Equity to Equity Capital Markets and Debt Capital Markets. It also includes a segment on Venture Capital funding for pre-IPO companies. The course emphasizes the role of the investment banking financial advisor and his/her importance in generating and completing deals that are in the best interests of their clients.</p> <p>The course heavily builds on cases to develop the learning experience. The cases help to apply corporate finance and valuation tools and concepts to real-world problems in modern investment banking. Every Case Study has been written by the Professor using actual numbers sourced from annual reports and prospectuses. Many cases include the outputs of detailed Excel spreadsheets, so as to ensure consistency and allow students to see how numbers are actually calculated. This is done at the level of an experienced investment banker, so contrasts with many traditional business school cases. The cases involve recent, very large, high profile transactions, each selected because of the unique lessons that can be learned from it.</p> <p>The course prepares students that aim at working in leading investment banks, private equity funds, sovereign wealth funds, strategy consulting firms and the corporate finance departments of major global corporates. Therefore the learning method involves a combination of case studies, in-class excel exercises and mentoring sessions led by the Professor. After the first day, the class will form into self-selected teams and each team will have private 20-minute group with the Professor in the afternoon session. This is an essential part of the learning process, because it will illustrate the thought process required to solve complex corporate finance issues.</p>
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<p>Intended Learning Outcomes</p>	<p>Knowledge: On successful completion of this module, students will have an in-depth understanding of modern investment banking, e.g. they can:</p> <ul style="list-style-type: none"> • Summarise and interpret investment banking case situations related to M&A, Private Equity, Equity Capital Markets (including venture capital financing and IPOs), and Debt Capital Markets • Understand the key numerical aspects of each type of transaction • Understand each type of transaction in the context of real companies, using their own Financial Statements and the Notes relating thereto <p>Skills: On successful completion of this module, students will have the proven ability to relate the gained knowledge and studied concept to real world situations, e.g. they can:</p> <ul style="list-style-type: none"> • Apply valuation models to real world situations • Identify the demands of clients in investment banking • Prepare and solve cases in modern investment banking <p>Competence: On successful completion of this module, students will be able to transfer the learned concepts to the investment banking industry and corporate finance departments of large global corporations, e.g. they can:</p> <ul style="list-style-type: none"> • Partake in the financial advisory process • Relate the knowledge of an IB practitioner to a valued client • Identify new transaction opportunities for clients
<p>Forms of teaching, methods and support</p>	<p>Lectures & Case Study Discussions</p> <p><u>Lectures</u> i) Specific Case Study presentations in M&A, Equity Capital Markets & Debt Capital Markets ii) Presentations explaining the concepts, mechanics and calculations relating to each of these transaction types</p> <p><u>Excel</u> In-Class Excel Exercises where the professor will use his own templates, and guide the class through writing the formulas for themselves</p> <p><u>Team Mentoring Sessions</u> Working as a team and using the Professor as their mentor to undertake the Case Study exam</p>

Type of Assessment(s) and performance

Type of examination	Duration or length	Performance Points	Due date or date of exam
Multiple choice test	30 Minutes	30	Exam Week
Case studies (group)	20 minutes	70	Saturday morning session
Excel test	20 minutes	20	Friday afternoon (end)

The **Multiple Choice Exam** is an individual quiz on concepts taught in Class during the module and involves 30 questions to be answered in 30 minutes, each with 4 possible answers, only one of which is correct. 1 point per correct answer - no negative marks for wrong answers

The **Case Study Exam** is a group project which will cover a specific Investment Banking Case set by Prof. Hirst. It will require a Powerpoint Presentation and an Excel Model. Time will be set aside during part of each of the last 4 days of Lectures for Case Preparation under the mentorship of the Professor. Teams will be given 20 minutes to present their Case on Saturday morning. Each team will be graded separately, but members of each team will be awarded the same team grade.

Excel Test will require students to write the formulas in a standardised template which has been demonstrated in class. This is an individual test - a number of students will not need the full 20 minutes to complete the task.

Recommended Literature	<p>Required:</p> <ul style="list-style-type: none"> • Cases studies and presentations/excel spreadsheets(will be made available in the course) <p>Highly Recommended:</p> <ul style="list-style-type: none"> • Course Notes (Part I and II) by Simon R. Hirst - available on line prior to course commencement. They cover key accounting concepts, as they relate to corporate finance) <p>Recommended (to refresh corporate finance basics):</p> <ul style="list-style-type: none"> • Damodaran, A., Damodaran on Valuation, John Wiley & Sonso • Berk, J. and De Marzo, P., Corporate Finance, Pearson International • Hillier, D., Ross, S., Westerfield, R., Jaffe, J. and Jordan, B., Corporate Finance, McGraw-Hill, European Edition • Brealey, R., Myers, S. and Allen, F., Corporate Finance, McGraw-Hill International Edition
Module Structure	<p>The module structure has three elements:</p> <ul style="list-style-type: none"> • Presentations which give a detailed understanding of the key concepts relating to M&A/Private Equity, Equity Capital Markets and Debt Capital Markets • Case Studies in each of these topics, using live examples with a detailed analysis of the numbers in each case • Review of financial models which are used to interpret numbers in each type of transaction
Usability in other Modules/Programmes	Other modules in Corporate Finance Concentration; M&A and Advanced M&A electives
Last Approval Date	2020/01/31

M&A Accounting [ACC71220-1565946861456]

Module Coordinator		Löw, Edgar			
Programme(s)		MSc MF			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Compulsory Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		<p>This module aspires to make you familiar with the financial reporting implications of M&A transactions resulting in subsidiaries, associate companies, joint ventures or pure financial instruments investments. Therefore basic knowledge of preparing and interpreting financial statements under International Financial Reporting Standards (IFRS) would be helpful to follow the course properly. Risk Management, Corporate Finance, Financial Statement Analysis.</p>			

Content	<ol style="list-style-type: none"> 1) Strategic aspects of M&A transactions <ul style="list-style-type: none"> • Preparation of a transaction from the perspective of accounting • Internal and external communication (including capital market communication) • Integration into the IT system and other technical aspects 2) Linkage to company valuation <ul style="list-style-type: none"> • Cash flow versus accrual • Purchase price allocation • Intangible assets 3) Group/group consolidation <ul style="list-style-type: none"> • Differentiation of investments (subsidiary, associate company, joint ventures, financial investments) • accounting consequences 4) Purchase of a company <ul style="list-style-type: none"> • Concept of control • Purchase price and purchase price allocation • Goodwill and goodwill accounting (including impairment test) • Date of consolidation • Full consolidation method • Minorities 5) Consolidation of special purpose entities 6) Associate companies and equity method 7) Joint ventures 8) Financial instruments <ul style="list-style-type: none"> • Introduction
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<p>Intended Learning Outcomes</p>	<p>Accounting for M&A transactions is relevant for all larger companies. M&A transactions are investments that often involve large amounts of money and can profoundly change the size and structure of companies, with potentially large effects on firm value. Studies in industrial economics and corporate finance show that a high percentage of M&A transactions fail to meet their operational and financial goals. Therefore, transparent and meaningful reporting on the consequences of M&A transactions is crucial for effective monitoring of managerial decision making.</p> <p><i>Knowledge:</i> On successful completion of this module, students should be able to:</p> <ul style="list-style-type: none"> • Point out the significance of different types of M&A transactions for companies in today’s economy • Discuss the validity of different M&A strategies and their consequences for firm value • Explain the process involved in incorporating newly acquired subsidiaries into parent companies’ consolidated financial statements (purchase price allocation) • Interpret the accounting concept of goodwill and its treatment in subsequent reporting periods (including goodwill impairment test) • Cover the financial reporting effects of investments in joint ventures and associates <p><i>Skills:</i> This module focusses on financial statements prepared under International Financial Reporting Standards (IFRS) which publicly traded companies domiciled in the EU are required to apply. Students will enhance their ability to:</p> <ul style="list-style-type: none"> • Recapture briefly the basics of preparing and analyzing consolidated IFRS statements • Deal with the most important accounting rules and reporting requirements for M&A transactions and for financial instruments • Interpret financial statements before and after major acquisitions/desinvestments • Interact between balance sheet and p/l information on the one hand and information provided within the notes on the other hand <p><i>Competence:</i> Students should be able to</p> <ul style="list-style-type: none"> • Differentiate and apply different accounting rules regarding M&A transactions • Use the full consolidation method as well as the equity method in order to implement respective transactions • Interpret and analyze risks and rewards of M&A transactions out of financial statements (including notes)
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Type of Assessment(s) and performance	Type of examination	Duration	Performance points	Due date
	Group presentation	90 min	120	During the module

Recommended Literature	<p>Recommended Literature</p> <p>For major parts of the course you may refer to the following commentaries by leading international accounting and audit firms</p> <ul style="list-style-type: none"> • <i>Deloitte</i>, iGAAP, every edition since 2015 • <i>Ernst & Young</i>, International GAAP, every edition since 2015 • <i>KPMG</i>, Insights into IFRS, every edition since 2015 • <i>PwC</i>, Manual of Accounting, every edition since 2015 <p>Other materials and readings</p> <ul style="list-style-type: none"> • <i>Libby/Libby/Hodge</i>, Financial Accounting, 9th edition, McGraw-Hill/Irwin 2016 • <i>Sticky/Weil/Schipper/Francis</i>, Financial Accounting, 14th, edition, South-Western 2012 • <i>Picker/Clark/Dunn/Kolitz/Livne/Loftus/van der Tas</i>, Applying IFRS, 4rd edition, Wiley 2016 <p>IFRS</p> <p>This module is based on the IFRS pronouncements that regulate the accounting for financial instruments, hedging activities as well as investments in subsidiaries, joint ventures, and associates, in IFRS consolidated financial statements. Therefore, it is important for you to access to these standards. This is generally possible in the following ways</p> <ul style="list-style-type: none"> • IASB website (registration required): http://www.ifrs.org/IFRSs/IFRS.htm • EU Official Journal • Several text editions, some of them bilingual <p>Useful websites of financial accounting standard setters</p> <ul style="list-style-type: none"> • International Accounting Standards Board (IASB): www.ifrs.org • U. S. Securities Exchange Commission: www.sec.gov • Financial Accounting Standards Board (FASB): www.fasb.org • European Financial Reporting Advisory Group (EFRAG) endorsement update: http://www.efrag.org/Front/Home.aspx <p>Useful news sources on (international) financial accounting</p> <ul style="list-style-type: none"> • Current news on (international) financial accounting developments on Deloitte's websites at www.iasplus.com (English) or www.iasplus.de (German). • Newsletters from CFO magazine (www.cfo.com; English) and GASC (www.drsc.de; German).
Module Structure	

Usability in other Modules/Programmes	Other modules in Financial Advisory Concentration
Last Approval Date	2020/01/31

Marketing Analytics [MGT73730]

Module Coordinator		Bleier, Alexander			
Programme(s)		MSc MiM			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Concentration Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Students should master basic mathematical and statistical concepts.			
Content		<p>Firms rely increasingly on vast amounts of data to inform marketing decisions. The goal of this course is to provide students with key skills that will equip them for a career where analytics and data-driven decision making replace management by intuition. Primary techniques that will be covered are:</p> <ul style="list-style-type: none"> • Descriptive and predictive linear regression • Logistic regression • Hierarchical and nonhierarchical cluster analysis • Conjoint Analysis • Forecasting 			
Intended Learning Outcomes		<p>Upon completion of this course students should be able to:</p> <ul style="list-style-type: none"> • Apply appropriate quantitative analyses to solve managerial problems with available data • Measure and assess the effectiveness of marketing strategies and tactics • Understand, interpret, and discuss the outputs and procedures of statistical analysis software • Leverage advanced skills in Excel and basic skills in R 			
Forms of teaching, methods and support		This course may include traditional lectures and discussions as well as homework assignments, group work, case studies, guest lectures, and individual applications.			

Type of Assessment(s) and performance	Type of examination	Duration	Performance Points	Due date or date of exam
	Assignments	TBA	20	During the module
	Class participation	Throughout the module	10	Throughout the module
	Written exam	60 minutes	60	Exam week
	Group project	TBA	30	During the module
Recommended Literature	<ul style="list-style-type: none"> John W. Foreman, Data Smart: Using Data Science to Transform Information into Insight, Wiley 2013. 			
Module Structure	<p>In this course, the learning process will typically encompass three phases: In phase one, the theoretical concepts of a specific quantitative method will be introduced, allowing students to understand the corresponding foundational mechanisms and relationships. In phase two, students will learn how these concepts translate into actual models and build them in Excel. Having successfully mastered the knowledge transfer from concepts to actual models, in phase three, students will use R to leverage the specific methods in empirical applications. The goal of this three-phase design is to help students gain a solid understanding of important quantitative methods and equip them with the necessary knowledge for their strategic employment and evaluation.</p>			
Usability in other Modules/Programmes	Digital Marketing and Master's Thesis			
Last Approval Date	2020/03/05			

Operations Strategy [MGT73760]

Module Coordinator		Schlapp, Jochen			
Programme(s)		MSc MiM			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Concentration Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		No specific prerequisite is requested			
Content		<p>In today's fast-paced markets, firms continuously have to improve and reinvent their value creation process to stay ahead of their competitors. To achieve this, it is crucial for a firm to derive and implement an operations strategy that supports the firm's unique value proposition and that is well synchronized with other supporting functions such as, e.g., human resources, finance, and sales.</p> <p>This course provides a broad coverage of the many different facets of operations strategy. The topics include the historical sources of operations strategy, its link to other strategic decisions, procurement, the role of organizational learning and forgetting, the integration of new technologies, search theory, new business models, environmental considerations, revenue management, and the question of how to manage the implementation of a new strategic initiative.</p>			

<p>Intended Learning Outcomes</p>	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of principal concepts and theories in operations; i.e., they can:</p> <ul style="list-style-type: none"> • explain the main concepts and theories of operations strategy, • identify the key challenges in designing efficient value creation processes, • understand the impact of operational decisions on firm performance. <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply advanced knowledge in operations strategy and to solve complex managerial problems; i.e., they can:</p> <ul style="list-style-type: none"> • apply theories and concepts to analyse and optimise real-world problems, • evaluate the interactions between different strategic decisions and create strategic alignment, • evaluate the benefits and shortcomings of different value creation processes. <p><i>Competencies:</i> On successful completion of this module, students can:</p> <ul style="list-style-type: none"> • develop a coherent operations strategy, • structure value creation processes, • evaluate the impact of operations on firm performance. 																
<p>Forms of teaching, methods and support</p>	<p>Lectures, classroom discussions, classroom experiments, case presentations</p>																
<p>Type of Assessment(s) and performance</p>	<table border="1" data-bbox="480 1350 1378 1659"> <thead> <tr> <th>Type of Examination</th> <th>Duration</th> <th>Performance Points</th> <th>Due Date</th> </tr> </thead> <tbody> <tr> <td>Class Participation</td> <td></td> <td>20</td> <td>During the module</td> </tr> <tr> <td>Quizzes</td> <td></td> <td>30</td> <td>During the module</td> </tr> <tr> <td>Essay (individual or group)</td> <td></td> <td>70</td> <td>End of the module</td> </tr> </tbody> </table>	Type of Examination	Duration	Performance Points	Due Date	Class Participation		20	During the module	Quizzes		30	During the module	Essay (individual or group)		70	End of the module
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Class Participation		20	During the module														
Quizzes		30	During the module														
Essay (individual or group)		70	End of the module														
<p>Recommended Literature</p>	<ul style="list-style-type: none"> • J. van Mieghem, G. Allon. 2015. Operations Strategy: Principles and Practice. Dynamic Ideas, Massachusetts, USA. • N. Slack, M. Lewis. 2015. Operations Strategy. Pearson, UK. • R. Hayes, G. Pisano, D. Upton, S. Wheelwright. 2005. Pursuing the Competitive Edge. John Wiley & Sons, USA. • G. Pisano, D. Upton, R. Hayes. 1996. Strategic Operations: Competing through Capabilities. Free Press, USA. 																

Module Structure	Topic 1: Foundations of Operations Strategy and the VCAP Framework Topic 2: Capabilities, Competition and Operations Topic 3: Investing in Real Assets: The Make Decision Topic 4: Procurement: The Buy Decision Topic 5: Managing Demand Topic 6: Operational Complexity and Regulation
Usability in other Modules/Programmes	Master's Thesis
Last Approval Date	2020/01/31

Prescriptive Analytics [MGT73740]

Module Coordinator		Francas, David			
Programme(s)		MSc MiM			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Concentration Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Basic knowledge of linear algebra and calculus, probability distributions, basic spreadsheet engineering skills (i.e.: working knowledge of Microsoft Excel).			
Content		Prescriptive analytics enable companies to transform descriptive data into business-critical, actionable insights. This course introduces prescriptive analytics using operations research models applied to a wide range of business problems. This will include an introduction to operations research methods (linear programming, mixed integer programming, heuristics and stochastic extensions). The key objective is to acquire the skills and knowledge necessary to apply prescriptive analytics in companies. To this end, a strong emphasis will be given to modelling and solving business problems and case studies from practice.			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of Operations Research and Prescriptive Analytics, i.e. they gain the knowledge necessary to</p> <ul style="list-style-type: none"> analyze and model problems in operations, supply chain management, and other business areas identify and apply appropriate mathematical optimization methods <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to build their own model formulations, i.e. they can</p> <ul style="list-style-type: none"> carry out a formal analysis and planning of problems in operations, supply chain management, and other business areas using operations research techniques expand existing formal models use model formulation and appropriate software for solving business problems in practice <p><i>Competencies:</i> On successful completion of this module, students can take responsibility for solving real-world problems in industry and consulting and implementing their solutions by using appropriate optimization and modelling tools, i.e. they can</p> <ul style="list-style-type: none"> critically evaluate the impact of model assumptions choose an appropriate solution technique for a given problem and transfer it to a formal model 												
Forms of teaching, methods and support	Teaching, discussions, formal and practical exercises (using Excel), case studies												
Type of Assessment(s) and performance	<table border="1"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance Points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td>Case study</td> <td>TBA</td> <td>30</td> <td>During the module</td> </tr> <tr> <td>Written exam</td> <td>90 minutes</td> <td>90</td> <td>Exam week</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Case study	TBA	30	During the module	Written exam	90 minutes	90	Exam week
Type of examination	Duration or length	Performance Points	Due date or date of exam										
Case study	TBA	30	During the module										
Written exam	90 minutes	90	Exam week										
Recommended Literature	<ul style="list-style-type: none"> Hillier, F. S. and G. J. Lieberman (2001), Introduction to Operations Research, McGraw-Hill, New York, 7th edition Winston, W. L. (2004), Operations Research: Applications and Algorithms, Duxbury Press, Philadelphia, 4th edition 												
Module Structure	<ul style="list-style-type: none"> Introduction to linear programming Simplex method and duality theory Fundamentals of mixed-integer programming Branch and bound algorithm Mixed-integer problems in production, logistics, and other business areas Heuristics for combinatorial problems Case study 												
Usability in other Modules/Programmes	Master's Thesis; the module is part of the concentrations 'Technology & Operations' and 'Business Analytics'. The content will be helpful for other modules in these concentrations.												

Last Approval Date	2020/03/05
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Resource Allocation Strategy [MGT71778]

Module Coordinator		Klingebiel, Ronald																			
Programme(s)		Master in Management																			
Term		Semester 3																			
Module Duration		1 Semester																			
Compulsory/Elective Module		Compulsory Module																			
Credits:		6																			
Frequency		Annually																			
Language		English																			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h																
Prerequisites		Foundational strategy knowledge																			
Content		The course examines performance consequences of strategic decisions under uncertainty and showcases firms' heuristics for managing their probability of making strategic mistakes. The course explores unique configurations of strategy that permit equifinal success in competitive markets. The strategy configurations address trade-offs made by early and late movers, specialists and generalists, and pure players and integrators make, for example. The course also covers fundamental laws of probability and behaviour that underpin resource-allocation strategy.																			
Intended Learning Outcomes		Upon completion, students ought to be able to <ul style="list-style-type: none"> • Negotiate the trade-offs involved in allocating resources to strategic initiatives • Manage the uncertainty inherent in strategic decision making • Apply strategic foresight to anticipate competitive market dynamics 																			
Forms of teaching, methods and support		The format includes lecturing as well as interactive exercises and case work.																			
Type of Assessment(s) and performance		<table border="1"> <thead> <tr> <th>Type of Assessment</th> <th>Duration</th> <th>Performance Points</th> <th>Due Date</th> </tr> </thead> <tbody> <tr> <td>Assignment</td> <td></td> <td>70</td> <td></td> </tr> <tr> <td>Presentation</td> <td></td> <td>25</td> <td></td> </tr> <tr> <td>Participation</td> <td></td> <td>25</td> <td></td> </tr> </tbody> </table>				Type of Assessment	Duration	Performance Points	Due Date	Assignment		70		Presentation		25		Participation		25	
Type of Assessment	Duration	Performance Points	Due Date																		
Assignment		70																			
Presentation		25																			
Participation		25																			

Recommended Literature	Each session comes with a list of references. Since this course is at the frontier of knowledge, no single text yet contains all relevant elements. For a foundational overview of strategy, see Grant, R.M. (2016) <i>Contemporary Strategy Analysis</i> , 9th ed For background on resource-allocation challenges, see Bower, J.L., Gilbert, C.G. (2005) <i>From Resource Allocation to Strategy</i> , OUP
Module Structure	Sessions are organized around specific trade-offs and challenges in resource allocation strategy.
Usability in other Modules/Programmes	Master?s Thesis, Strategic Management Control
Last Approval Date	2020/05/19

Risk Modelling [FIN71630]

Module Coordinator		Irle, Sebastian			
Programme(s)		MSc MF			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Concentration Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		Risk Management core module.			
Content		<ul style="list-style-type: none"> • Coherent risk measures • Statistics of risk factors • Financial time series • Extreme value theory • Copulas and dependence 			

Intended Learning Outcomes	<p><i>Knowledge:</i> On successful completion of this module, students will have a thorough comprehension of risk measures, i.e. they can:</p> <ul style="list-style-type: none"> • Specify statistical approaches for analysing financial time series • Review modelling approaches for risk management, in particular with regard to heavy-tailed distributions and multivariate models <p><i>Skills:</i> On successful completion of this module, students will have the proven ability to apply statistical methods to financial risk modelling, i.e. they can:</p> <ul style="list-style-type: none"> • Fit real-world data, e.g. financial time-series, to appropriate statistical models • Apply risk modelling techniques to compute economic capital or other risk measures <p><i>Competence:</i> On successful completion of this module, students can take responsibility to transfer these methods to situations in organisations, i.e. they can:</p> <ul style="list-style-type: none"> • Appreciate the importance of quantitative risk management • Discuss any advanced risk modelling issues with quantitative risk modellers • Assess and judge quantitative risk models in the context of bank-wide risk management • Act as an interface between risk modellers and risk managers 								
Forms of teaching, methods and support	Lecture, script, Excel examples, case studies								
Type of Assessment(s) and performance	<table border="1"> <thead> <tr> <th>Type of examination</th> <th>Duration or length</th> <th>Performance Points</th> <th>Due date or date of exam</th> </tr> </thead> <tbody> <tr> <td>Case study presentations in groups</td> <td>30 min</td> <td>120</td> <td>During the module</td> </tr> </tbody> </table>	Type of examination	Duration or length	Performance Points	Due date or date of exam	Case study presentations in groups	30 min	120	During the module
Type of examination	Duration or length	Performance Points	Due date or date of exam						
Case study presentations in groups	30 min	120	During the module						
Recommended Literature	<ul style="list-style-type: none"> • Hull, J.: Risk Management and Financial Institutions. Pearson Prentice Hall, 2007 • McNeil et al.: Quantitative Risk Management. Princeton University Press, 2005 • Da Costa Lewis, N.: Market Risk Modelling: Applied statistical methods for practitioners. Risk Books, 2003 								

Module Structure	<p>This module covers state-of-the-art techniques of risk modelling. General risk measures (coherent, convex) and associated techniques of capital allocation are discussed. Models for financial time series (GARCH, etc.), and advanced dependence modelling techniques (copulas) are taught. The most important results from extreme value theory demonstrate how to choose the appropriate distributions for modelling extreme events (tail events).</p> <p>The aim of the module is to deepen the knowledge of "Risk Management" in particular: to understand the general concept of a coherent risk measure; to provide a sound understanding of statistical methods applied in financial risk modelling; to learn modelling approaches in-line with observed empirical facts of financial time series, such as heavy tails in return distributions, and how to apply them; to learn multivariate modelling approaches for treating dependence in portfolios.</p> <p>Note that programming skills (e.g. in Python, Matlab, R,...) are mandatory for a successful and time-efficient completion of the case study, which is data driven and aims at the practical application of risk modelling techniques. The successful completion of relevant coding exercises (e.g. datacamps for Python, www.datacamp.com) as a preparation for this risk modelling class is advised.</p>
Usability in other Modules/Programmes	Other modules in Risk Management Concentration.
Last Approval Date	2020/02/28

Strategic Management Control [MGT74910]

Module Coordinator		Mahlendorf, Matthias			
Programme(s)		MSc MiM			
Term		Semester 3 Q2			
Module Duration		1 Semester			
Compulsory/Elective Module		Concentration Module			
Credits:		6			
Frequency		Annually			
Language		English			
Workload:	150 h	Contact hours:	44 h	Independent Learning:	106 h
Prerequisites		None			
Content		<p><i>“However beautiful the strategy, you should occasionally look at the results” — Sir Winston Churchill</i></p> <p><i>“Strategy Execution is the responsibility that makes or breaks executives” — Alan Branche and Sam Bodley-Scott</i></p> <p>In this course, we will cover tools and concepts such as balanced scorecard, strategy map, action controls, personnel controls, planning and predicting (operations, demand, sales, costs), resource allocation, strategic profitability analysis, prioritizing core values and strategic risk, performance measurement in young and growing firms to manage growth while preserving entrepreneurship and adaptability, and more. The course will emphasize quantitative approaches (i.e.: use calculations to improve decision-making and strategy execution).</p>			
Intended Learning Outcomes		<p>The content of this course will be useful for the following career paths:</p> <ul style="list-style-type: none"> • general management (being responsible for the performance of a business function, a business unit, or a non-profit organisation) • entrepreneurs and consultants (designing new structures and systems to implement strategy) • analysts, investors and board members (monitoring strategy execution by company management) <p>This course teaches how to successfully implement strategy and to measure performance improvements. Participants will learn the tools to:</p> <ol style="list-style-type: none"> 1. map and communicate the strategy 2. design the management control system 3. plan and coordinate strategy implementation 4. evaluate and reward strategic performance 			

Forms of teaching, methods and support	The concepts will be illustrated using case studies, simulation games, presentations, discussion of articles, exercises and practitioner talks.			
Type of Assessment(s) and performance	Type of Examination	Duration	Performance Points	Due date or date of exam
	Quizzes, Simulation Games		40	During the module
	Presentation	20 minutes	20	During the module
	Written exam	60 minutes	60	Exam week
Recommended Literature	<p>Kaplan, R. S., & Norton, D. P. (2000) - Having trouble with your strategy? Then map it.</p> <p>Datar & Rajan (2017) Horngren's Cost Accounting - A Managerial Emphasis, Chapter 3: Cost-Volume-Profit-Analysis</p> <p>Datar & Rajan (2017) Horngren's Cost Accounting - A Managerial Emphasis, Chapter 12: Strategy, Balanced Scorecard, And Strategic Profitability Analysis</p> <p>Wade et al (2016) - Strategies for Responding to Digital Disruption</p> <p>Wouters et al. (2012) Cost Management - Strategies for Business Decisions, Chapter 8: Strategic Investment Decisions</p>			

Module Structure	<ol style="list-style-type: none"> 1 Strategy, Digitalization & Disruption 2 Product lifecycle and product portfolio selection (BCG Matrix) 3 Strategic investment decisions (Monte Carlo simulation, real options) 4 Break-even analysis and operating leverage 5 Lower price limits, industry demand curve, tit for tat strategy 6 MIT simulation game: A Commodity Pricing Simulation 7 Value chain, Strategic Uncertainties 8 Learning curves, Economies of Scale, Pricing Strategies 9 MIT simulation game: Eclipsing the Competition 10 Service, product, and customer profitability 11 Segment profitability (Multi-level contribution margin, transfer pricing) 12 Value based management (DuPont, ROA, EVA) 13 Measuring strategy execution with the balanced scorecard & Explanations for the simulation 14 Harvard strategy simulation 15 Identifying performance drivers in big data with data analytics (TRUFA, Tableau) 16 Target setting, incentives, OKR 17 Resource allocation, decentralization, delegation, budgeting 18 Strategic profitability analysis 19 MIT Simulation Game: Platform Wars: Simulating the Battle for Video Game Supremacy 20 Mock exam, Space Race Quiz Game, Student Evaluation
Usability in other Modules/Programmes	Master's Thesis
Last Approval Date	2019/08/15