

EBERHARD KARLS  
UNIVERSITÄT  
TÜBINGEN

Academic Year 2013/2014



# Module Handbook Doctoral Program in Finance

FACULTY OF ECONOMICS AND SOCIAL SCIENCES  
School of Business and Economics



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<b>ECTS-Credits</b>	9
<b>Workload Hours</b>	Contact Hours: 60    Independent Study: 210
<b>Duration</b>	1 Semester
<b>Cycle</b>	generally: SS (entfällt im SS 14)
<b>Language</b>	English
<b>Course Type</b>	Lecture, Colloquium, Seminar
<b>Method of Assessment</b>	Written Exam (90 minutes), Presentation, Assignment
<b>Prerequisite for</b>	---
<b>Prerequisites</b>	---
<b>Limited Attendance</b>	---
<b>Person Responsible</b>	Prof. Dr. Jens Grunert
<b>Lecturer</b>	Prof. Dr. Jens Grunert

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**This course can be taken as part of the following programs/modules:**

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*Doctoral Program*

Business Studies, Finance

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**Content**

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The lecture gives a survey of important topics in empirical banking. As examples, management of credit and operational risk, the influence of the intensity of the bank- client- relationship and the impact of bank mergers can be mentioned.

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**Objectives**

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Knowledge of relevant questions in banking practice and their analyses in empirical studies.

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**Literature**

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see course homepage in ILIAS

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<b>ECTS-Credits</b>	6
<b>Workload Hours</b>	Contact Hours: 30    Independent Study: 150
<b>Duration</b>	1 Semester
<b>Cycle</b>	generally: SS
<b>Language</b>	English
<b>Course Type</b>	Colloquium (2 SWS)
<b>Method of Assessment</b>	Written Exam (240 minutes), 2 Presentations
<b>Prerequisite for</b>	---
<b>Prerequisites</b>	---
<b>Limited Attendance</b>	20
<b>Person Responsible</b>	Prof. Dr. Martin Ruf
<b>Lecturer</b>	Prof. Dr. Martin Ruf

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**This course can be taken as part of the following programs/modules:**

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*Doctoral Program*

Business Studies, Economics, Finance

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**Content**

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This course provides an opportunity to study and discuss current topics in international business taxation research. The course will present an introduction and overview on important recent papers in international business taxation published in leading scientific journals.

Students are expected to attend 2 presentations dealing with international business taxation in the research seminar series of the department.

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**Objectives**

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Students should gain knowledge on the current research topics in international business taxation such as international debt shifting and international transfer pricing. Students should achieve a basic understanding of the research methodologies currently applied in research on international business taxation.

Students are expected to present two research papers dealing with current topics in international business taxation and to participate in the following discussion of the paper.

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**Literature**

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Available on Ilias at the beginning of the term.

<b>ECTS-Credits</b>	9
<b>Workload Hours</b>	Contact Hours: 45    Independent Study: 225
<b>Duration</b>	1 Semester
<b>Cycle</b>	generally: SS
<b>Language</b>	English
<b>Course Type</b>	Lecture (2 SWS), Practice Course (1 SWS)
<b>Method of Assessment</b>	Written Exam , Assignments
<b>Prerequisite for</b>	---
<b>Prerequisites</b>	At least one out of: B400, B401, B470, B471 or S413
<b>Limited Attendance</b>	---
<b>Person Responsible</b>	Prof. Dr.-Ing. Rainer Schöbel
<b>Lecturer</b>	Prof. Dr.-Ing. Rainer Schöbel and assistants

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**This course can be taken as part of the following programs/modules:**

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*Doctoral Program*

Business Studies, Finance

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**Content**

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Modelling the random nature of financial markets: Brownian motion and stochastic integration; the fundamental partial differential equation of financial economics and applications; continuous-time portfolio selection; valuation in complete and incomplete markets.

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**Objectives**

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During this course students with a solid background in finance will be given access to the mathematical concepts of modern finance theory and their application to derivative securities pricing. After completion of this course students should be able to approach the literature in this field successfully and use continuous-time techniques for their own research.

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**Literature**

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Björk, T. (2009): *Arbitrage Theory in Continuous Time*, 3rd ed., Oxford  
Merton, R. (2004): *Continuous-Time Finance*, Rev. ed., repr., Cambridge  
Neftci, S.N. (2013): *An Introduction to the Mathematics of Financial Derivatives*, 3rd ed. repr., San Diego  
Pennacchi, G. (2008): *Theory of Asset Pricing*, Boston  
Wilmott P./ Dewynne J./ Howison S. (2000): *Option Pricing – Mathematical Models and Computation*, repr. with corr., Oxford.

<b>ECTS-Credits</b>	9
<b>Workload Hours</b>	Contact Hours: 45    Independent Study: 225
<b>Duration</b>	1 Semester
<b>Cycle</b>	generally: WS
<b>Language</b>	English
<b>Course Type</b>	Lecture (2 SWS), PC-Lab (1 SWS)
<b>Method of Assessment</b>	Written Exam , Assignments
<b>Prerequisite for</b>	---
<b>Prerequisites</b>	At least one out of: B470, B471, B472, B474 or S413
<b>Limited Attendance</b>	---
<b>Person Responsible</b>	Prof. Dr.-Ing. Rainer Schöbel
<b>Lecturer</b>	Prof. Dr.-Ing. Rainer Schöbel and assistants

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**This course can be taken as part of the following programs/modules:**

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*Doctoral Program*

Business Studies, Finance

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**Content**

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- Numerical integration and Monte Carlo methods
- finite difference methods
- Dynamic programming and optimization
- Fourier transform methods.

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**Objectives**

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In this course students learn to apply successfully state-of-the-art numerical methods to a variety of standard and advanced problems from finance, especially option pricing and portfolio optimization.

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**Literature**

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- Brandimarte, P. (2006): Numerical Methods in Finance and Economics, Hoboken, NJ  
Cherubini, U., et. al. (2010): Fourier Transform Methods in Finance, Chichester  
Gilli, M./ Maringer D./ Schumann E. (2011): Numerical Methods and Optimization in Finance, Amsterdam  
Glasserman, P. (2010): Monte Carlo Methods in Financial Engineering, New York

ECTS-Credits	6
Workload Hours	Contact Hours: 90    Independent Study: 90
Duration	1 Semester
Cycle	generally: SS (not offered in SS 14)
Language	English
Course Type	Seminar (taught in block format)
Method of Assessment	Assignments
Prerequisite for	---
Prerequisites	---
Limited Attendance	---
Person Responsible	Prof. Dr. Joachim Grammig
Lecturer	Prof. Dr. Joachim Grammig

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**This course can be taken as part of the following programs/modules:**

*Doctoral Program*

Finance

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**Content**

Principles of financial economics. GMM and regression based estimation and evaluation of asset pricing models. Econometric software GAUSS is used for practical financial applications. The course emphasizes the link of financial economics and the econometric modelling. The methods are applied in a practical class in the PC laboratory. Practical assignments are graded and partially account for the grade. This course is not offered at the University of Tübingen in SS 14. Instead, it will take place in Karlsruhe, where students of the University of Tübingen are allowed to participate. Please contact Prof. Joachim Grammig for further details.

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**Objectives**

Students should gain practical experience and a theoretical background in the application of econometric methods for the analysis of price processes in financial markets. They should be able to estimate and evaluate linear and nonlinear factor models and they should develop an understanding of the econometric methods and their limitations in asset pricing. Students should also learn how to present and discuss their results in a scientific proper fashion. They should be able to productively use econometric/statistical software for their own analyses in empirical finance.

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**Literature**

Cochrane, J. (2005): Asset Pricing, Princeton University Press  
Hayashi F. (2000): Econometrics, Princeton University  
Singleton K. (2006): Empirical Dynamic Asset Pricing, Princeton University

ECTS-Credits	9
Workload Hours	Contact Hours: 60    Independent Study: 210
Duration	1 Semester
Cycle	generally: SS (not offered in SS 14)
Language	English
Course Type	Lecture (4 SWS)
Method of Assessment	Written Exam (90 minutes), Assignment
Prerequisite for	B472, B473
Prerequisites	---
Limited Attendance	---
Person Responsible	Prof. Dr. Christian Koziol, Prof. Dr. Joachim Grammig
Lecturer	Prof. Dr. Christian Koziol, Prof. Dr. Joachim Grammig

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**This course can be taken as part of the following programs/modules:**

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*Doctoral Program*

Finance

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**Content**

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The course provides a modern advanced treatment of principles of financial economics. Security prices under no-arbitrage. Introduction to utility theory. Pricing in competitive economies, first-principles derivations of the capital asset pricing model (CAPM). Valuation in a multi-period framework. Consumption-based asset pricing model and the fundamental asset pricing equation. The stochastic discount factor (SDF) and beta-representations. Relation between SDF, betas and the mean-variance frontier. Linear SDF models revisited: arbitrage pricing theory and the intertemporal CAPM.

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**Objectives**

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Rigorous and in-depth treatment of foundations of financial economics in discrete time.

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**Literature**

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Huang, Chi-fu and Litzenberger, Robert H., 1998: "Foundations for Financial Economics", 1st Ed., Upper Saddle River, Prentice Hall.

Ingersoll, Jonathan E., 1987: "Theory of Financial Decision Making", 1st Ed., Lanham, Rowman & Littlefield Publishers.

Cochrane, John H., 2005: "Asset Pricing", New Ed. Revised Ed., Princeton, Princeton University Press.



<b>ECTS-Credits</b>	6
<b>Workload Hours</b>	Contact Hours: 60    Independent Study: 120
<b>Duration</b>	1 Semester
<b>Cycle</b>	generally: SS (not offered in SS 14)
<b>Language</b>	English
<b>Course Type</b>	Lecture (3 SWS), Practice Course (1 SWS)
<b>Method of Assessment</b>	Written Exam (90 minutes), Assignment
<b>Prerequisite for</b>	---
<b>Prerequisites</b>	---
<b>Limited Attendance</b>	---
<b>Person Responsible</b>	Prof. Dr. Joachim Grammig
<b>Lecturer</b>	Prof. Dr. Joachim Grammig

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**This course can be taken as part of the following programs/modules:**

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*Doctoral Program*

Finance

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**Content**

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Besides the institutional background and market microstructure basics, the course covers the main theoretical models of price formation (Roll model, Kyle model, Glosten model et cetera). The stylized facts of high frequency financial data are studied and illustrated in empirical applications using SAS. The course also involves structural models for the trading process (Huang/Stoll, Glosten/Harris, Madhavan/Richardson/Roomans model) and a thorough treatment of multivariate linear microstructure models and price discovery in a multiple market setting. Finally, insight is given into recent developments in the analysis of high frequency financial data (such as realized volatility, microstructure noise, algorithmic trading). Several case studies emphasize the empirical focus of the course.

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**Objectives**

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The aim of this course is to equip the students with a general knowledge of financial market's design and a deeper understanding concerning the influence of market characteristics on its efficiency and trading patterns. Besides gaining an insight into theoretical models, students should also learn to transfer their knowledge within the framework of empirical case studies using econometric/statistical software (SAS).

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**Literature**

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Harris, L. E. (2003). *Trading and Exchanges*. New York, Oxford University Press.  
Hasbrouck, J. (2007). *Empirical Market Microstructure*. New York, Oxford University Press (EMM)

<b>ECTS-Credits</b>	6
<b>Workload Hours</b>	Contact Hours: 60    Independent Study: 120
<b>Duration</b>	1 Semester
<b>Cycle</b>	generally: WS, biennially, next: WS 15/16
<b>Language</b>	English
<b>Course Type</b>	Lecture (3 SWS), Practice Course (1 SWS)
<b>Method of Assessment</b>	Written Exam (90 minutes)
<b>Prerequisite for</b>	---
<b>Prerequisites</b>	Basic knowledge of probability theory, linear algebra and econometric methods
<b>Limited Attendance</b>	---
<b>Person Responsible</b>	Prof. Dr. Martin Biewen
<b>Lecturer</b>	Prof. Dr. Martin Biewen and team members

**This course can be taken as part of the following programs/modules:**

*Doctoral Program*

Finance

### Content

Univariate Return Distributions. Extreme Value Theory. Multivariate Return Distributions. Copulas, Value at Risk. ARIMA Time Series. Random Walks, Market Efficiency. Stochastic Volatility, GARCH Times Series. CAPM-Model, Performance Measures. Stochastic Dominance. Brownian Motion, Stochastic Calculus. Option Pricing, Black-Scholes Model.

### Objectives

Introduction to the most commonly used statistical methods for analyzing financial variables. Motivation, derivation, and practical illustration of the different methods. The course focusses both on the derivation and the practical implementation of the different methods.

### Literature

Trede/Schmid: Finanzmarktstatistik  
 Franke/Härdle/Hafner: Statistics of Financial Markets  
 Campbell/Lo/MacKinlay: The Econometrics of Financial Markets  
 McNeil/Frey/Embrechts: Quantitative Risk Management  
 Baum: An Introduction to Modern Econometrics Using Stata

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Faculty of Economics and Social Sciences  
School of Business and Economics  
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