Hier vind je de beschrijvingen van de vakken in de minor. Meer inhoudelijke informatie over de minor vind je op minor.vu.nl.
<table>
<thead>
<tr>
<th>Vak: Case Study: A Modelling Competition (Periode 3)</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vak: Computational Econometrics (Periode 1)</td>
<td>1</td>
</tr>
<tr>
<td>Vak: Empirical Economics (Periode 2)</td>
<td>2</td>
</tr>
<tr>
<td>Vak: Empirical Finance (Periode 2)</td>
<td>3</td>
</tr>
<tr>
<td>Vak: Empirical Marketing (Periode 2)</td>
<td>4</td>
</tr>
<tr>
<td>Vak: Internship Minor Applied Econometrics: A Big Data Experience for All (Periode 2+3)</td>
<td>5</td>
</tr>
<tr>
<td>Vak: Introduction to Econometrics (Periode 1)</td>
<td>7</td>
</tr>
<tr>
<td>Vak: Introduction to Time Series (Periode 1)</td>
<td>8</td>
</tr>
</tbody>
</table>
Case Study: A Modelling Competition

**Doel vak**
This course in the minor Applied Econometrics is targeted at both econometrics and non-econometrics students. The objectives are to work together in a group, to describe methods and results in a report and presentation, to learn to perform empirical research and to apply the material of the courses in the periods 3.1 and 3.2 of the minor Applied Econometrics.

**Inhoud vak**
Case studies are carried out by teams of a heterogeneous group of students, coming from different study backgrounds. The students must write case reports and present their results. The groups compete to come up with the best specification of an econometric model.

**Onderwijsvorm**
Lecture.
Working groups of students.

**Toetsvorm**
Presentation and written report. At the end of the course each group must submit a final report (and the computer code that they used), and each group must give an oral presentation. The grade is mainly based on the final report, where only exceptional computer code and/or an exceptional oral presentation (in a good or bad sense) may lead to a (positive or negative) adaptation of the grade.

**Literatuur**
Selection of articles and papers.

**Vereiste voorkennis**
The courses of periods 3.1 and 3.2 in the Minor Applied Econometrics.

**Computational Econometrics**

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Doel vak
This course in the minor Applied Econometrics is targeted at Bachelor Econometrics students and Bachelor students with different backgrounds who have already had an introduction to programming and econometrics/statistics. The objective is to acquaint the student with Bayesian statistics and applications thereof to econometric problems, using advanced computational methods.

Inhoud vak
This course will cover Bayesian statistics where the topics include the prior and posterior density, Bayesian hypothesis testing, Bayesian prediction, and Bayesian Model Averaging for forecast combination. Several models will be considered, including the Bernoulli/binomial distribution, the Poisson distribution and the normal distribution. Obviously, attention will be paid to the Bayesian analysis of linear regression models. Also simple time series models will be considered. An important part of the courses is the treatment of simulation-based methods such as Markov chain Monte Carlo (Gibbs sampling, data augmentation, Metropolis-Hastings method) and Importance Sampling, that are often needed to compute Bayesian estimates and predictions and to perform Bayesian tests.

Onderwijsvorm
Lectures and exercises in the computer lab.

Toetsvorm
Final written exam – Individual assessment. Exercises - groups of 1 or 2 students.

Literatuur
Slides and exercises that will all appear on Canvas.

Aanbevolen voorkennis

Empirical Economics

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Doel vak
The main goal of this course is to make students familiar with using microeconometric techniques to empirically analyze economic models. Students should be capable to test economic theories empirically and to estimate policy relevant parameters. Next they learn how to interpret estimation results and to translate these into policy conclusions. Students learn to distinguish between causality and correlation.
Inhoud vak
This course first provides an overview on microeconometric techniques to estimate causal effects. In particular, the potential outcomes framework is discussed and within this framework policy relevant treatment effects are defined. Next, more structural economic models are presented and empirical analyses of these models are discussed. More specifically, during the course labor market models, consumer choice models, school assignment models and production functions are evaluated. During the course, there will be a theoretical discussion, presentation of empirical studies and students have to work with data.

Onderwijsvorm
Lectures and workgroups

Toetsvorm
Written exam and homework exercises

Literatuur

Vereiste voorkennis
Introduction to econometrics (linear regression and maximum likelihood) and basic statistics (estimation and hypothesis testing)

Empirical Finance

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Doel vak
The objective of the course is to show how econometrics can be applied to empirical questions in finance. In particular the course will cover topics such as financial data and its properties, factor models and testing pricing efficiency, modelling volatility, risk management models, model performance comparison, simulation procedures and continuous time finance. We will investigate how characteristics of financial data such as e.g. non-normality challenges the assumptions of econometric methods and how the methods can be adapted to handle such data properties. A mixture of academic papers and practical applications is used to study how econometric methodology is employed to facilitate financial decision making and extract information from financial market data. A vital part of the course will be tutorial sessions in which students have to solve programming problems that are topic-wise related to the theory discussed in class. Matlab and Stata will be used to apply methods learned in class to actual data.
Inhoud vak
Econometric methods covered are among others, factor models, event study methodology, volatility modelling (e.g. GARCH), historical simulation, Monte Carlo simulation.

Onderwijsvorm
Classes. In separate tutorials session, Matlab and Stata are used as programming tools to apply knowledge learned in class to real data problems.

Toetsvorm
Final exam – Individual assessment
Grading is based to 100% on the final exam

Literatuur
Brooks (2014): Introductory Econometrics for Finance, 3rd
Danielsson (2011): Financial Risk Forecasting

Vereiste voorkennis
None

Aanbevolen voorkennis
The courses of period 3.1 in the Minor Applied Econometrics.

Overige informatie
This course in the minor Applied Econometrics is targeted at both econometrics and non-econometrics students.

Empirical Marketing

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Doel vak
The objective is to show how econometrics can be applied to empirical questions in marketing and consumer behaviour. In particular, how to build models to support marketing decisions. Given the current big data revolution, models from which useful information about market behaviour and their sensitivity to marketing activities such as advertising, pricing, promotions and distribution are routinely used by managers (from leading organisations worldwide) for analyzing marketing programs that can improve brand performance. This course will introduce models and methods, together with their use in empirical marketing studies.

Inhoud vak
This course focusses on quantitative methods for empirical research in marketing and consumer behaviour. In particular, we discuss how to build models to support marketing decisions and how to adopt data science
methods to investigate market behaviour and the impact of marketing instruments such as advertising, pricing, promotions and distribution. The econometric methods that are employed include regression, multivariate statistical analysis, limited dependent variable models, panel data models, pooled regressions, forecasting methods, and trend extraction.

Onderwijsvorm
Lectures and classes. During classes time will be made for discussing exercises and for supporting empirical work. Computer classes are also organised

Toetsvorm
Final exam – Individual assessments

Literatuur
Reader, a selection of chapters and articles on various topics. The econometrics is mainly based on the book "Introduction to Econometrics" by J.H. Stock and M.W. Watson, which is also used in earlier courses.

Vereiste voorkennis
None, but an introductory course in econometrics is highly recommended, see below.

Aanbevolen voorkennis
Introductory courses in econometrics and time series, similar to the courses "Introduction to Econometrics" and "Introduction to Time Series" from our Minor program "Applied Econometrics: A Big Data Experience For All".

Doelgroep
This course is part of the Minor program "Applied Econometrics: A Big Data Experience For All".

Uitleg in Blackboard/Canvas
See above.

Intekenprocedure
As usual.

Overige informatie
This is a 6 EC course presented in period 2 (November-December) in the academic year. This course is part of the Minor "Applied Econometrics: A Big Data Experience for All". It is targeted at both econometrics and non-econometrics students.

Internship Minor Applied Econometrics: A Big Data Experience for All

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<td>dr. L.F. Hoogerheide</td>
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**Doel vak**

Academic Skills
- Ability to examine and understand problems from different perspectives;
- Ability to put forward well-founded, substantiated points of view, both in spoken and written format;
- Ability to apply acquired knowledge to other problems and in other contexts.

Research Skills
- Ability to translate practically relevant problems into (academically) relevant research questions;
- Ability to design and execute a project using a systematic, analytical approach in a real business environment (of profit or not-for-profit organizations).

Knowledge
- Have specialized, in-depth knowledge and insights about the minor theme;
- Ability to make connections between theories, models, and concepts of that specific minor theme/discipline.

Bridging Theory and Practice
- Ability to apply theoretical knowledge in a specific organizational context;
- Ability to formulate relevant recommendations for practice based on your knowledge acquired;
- Have a better understanding of what the expectations of the academic and professional field are in terms of knowledge and skills needed;
- Have awareness of the various career opportunities the field offers.

Social Skills
- Have a better understanding of roles and needs of different types of stakeholders that you need to interact with as a professional;
- Ability to work well in a team and reflect on your own role in the team.

Self-awareness
- Ability to reflect on your own responsibilities as well as others;
- Ability to reflect on your personal development;
- Ability receive and are able to deal with feedback from others.

**Inhoud vak**

Increasingly organizations and maybe even your future employer are looking for experience as well as academic credentials. The School recommends doing an internship, because it is an excellent way to apply the knowledge and (academic) skills which you acquired during your studies. Your most important learning goal as a student-intern is to familiarize yourself with professional and market-related skills in a real and new organizational environment. With the job market becoming increasingly competitive, gaining relevant experience will give you a good start into your professional career.

Companies offer a wide range of internships in various disciplines. What
is crucial in obtaining approval for your internship and eventually obtaining your study credits, is that there is a clearly defined project that allows you to fulfill the learning objectives. Also, the project needs to allow for an individual assessment.

Finally, note that in order to obtain your internship credits, your internship has to be pre-approved by the minor coordinator and supervised by a School member that is assigned to you by either the minor coordinator.

**Onderwijsvorm**
On-site Internship

**Toetsvorm**
Written report – Individual assessment

**Literatuur**
Literature relevant to the theme of the minor and internship should be used to develop a solution to the problem that is investigated with the internship project.

**Aanbevolen voorkennis**
The courses in period 3.1 of the minor Applied Econometrics.

**Overige informatie**
IMPORTANT:

- Subscription to the internship through VUnet is not possible.

- CONTACT THE MINOR COORDINATOR as soon as you have an INITIAL proposal for the internship. Approval of the minor coordinator is essential in order to be able to do a minor internship.

- The general internship manual will be available through VUnet (including more details on a time plan and practical matters). CAREFULLY READ THE MANUAL ON VUNET (go to Services > Degree programme > Internship, or Serviceplein > Opleidingsprogramma > Stage). The manual will provide more insights in what is exactly expected in terms of your internship proposal, the concrete requirements, and the related time line of activities.

- After completing the internship the subscription to the course as well as the registration of the result will be done by the back office.

**Introduction to Econometrics**

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Doel vak
This course in the minor Applied Econometrics is targeted at non-econometrics students. By the end of this course students will have had an introduction to modern econometric techniques, that will enable them to conduct methodological or empirical analyses of their own. In particular, students will be familiar with both econometric theory and with real-world applications in macroeconomics, finance and business.

Inhoud vak
A review will be given of estimation and testing in the linear cross-sectional regression model. We will discuss the classical assumptions, and the consequences arising when these assumptions are not fulfilled.
Throughout the course, the focus will lie on developing an intuition for state-of-the-art econometric concepts. A balance will be struck between theoretical derivations and empirical applications. The textbook used (see below) is particularly well-suited for this purpose, as it is targeted at an audience of advanced undergraduate students in economics and business studies. Extensive use will be made of the statistical software Stata, both for in-class illustration and for hands-on exercises.

Onderwijsvorm
Interactive lectures and exercises in the computer lab.

Toetsvorm
Final written exam (85%) and practical assignment (15%)

Literatuur
Stock and Watson (2010), Introduction to Econometrics, 3rd edition.

Aanbevolen voorkennis
This course builds on the foundations laid either in the sequence of courses in ‘Kwantitatieve Methoden’ (in the Economics programme) or in that of ‘Statistics’ and ‘Business Mathematics’ (in the Business Administration programme). It assumes familiarity with probabilistic concepts such as discrete and continuous random variables, conditional expectations, hypothesis testing and central limit theorems, with the basics of matrix calculus, and with the essentials of regression analysis. This material, excluding matrix calculus, corresponds more or less to chapters 1-5 in Stock & Watson, and students are recommended to refresh their memory prior to the first lecture.

Overige informatie
Participation in this course is a worthwhile preparation for the methodological elements of Master courses Advanced Microeconomics 4.2 and Empirical Finance 4.2 and is thus recommended to those intending to pursue a Master in Economics or Finance. The econometric techniques discussed will also be beneficial to everyone planning to write an empirical Bachelor’s thesis.

Introduction to Time Series

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Doel vak
This course introduces students to time series analysis and dynamic econometric models.

Inhoud vak
This course covers both theoretical and practical aspects of time series econometrics including the analysis of stationary and non-stationary stochastic processes in economics and finance.

The students are introduced to autoregressive moving average (ARMA) models, autoregressive distributed lag (ADL) models, and error correction models (ECM). Furthermore, the course provides both theoretical and practical insight into parameter estimation in time-series and the use of these models for forecasting, testing for Granger causality, and performing policy analysis using impulse response functions.

Finally, the students become familiar with the fundamental problem of spurious regression in time-series analysis. We find a solution to this problem by taking a journey into the theory and practice behind unit-root tests, cointegration tests and error-correction representation theorems.

Onderwijsvorm
Lectures and practical classes. During practical classes time will be made for discussing exercises.

Toetsvorm
Final exam and group assignment – Individual assessment.

Literatuur
Lecture notes and other material provided by teacher.

Recomended optional reading material:


Vereiste voorkennis
None.

Aanbevolen voorkennis
This course builds on the foundations laid either in the sequence of courses in `Kwantitatieve Methoden` (in the Economics programme) or in that of `Statistics` and `Business Mathematics` (in the Business

Voertaal  Engels
Faculteit  School of Business and Economics
Coördinator  dr. F. Blasques Albergaria Amaral
Examinator  dr. F. Blasques Albergaria Amaral
Lesmethode(n)  Hoorcollege, Werkcollege
Administration programme). It assumes some familiarity with probability and statistics. This material corresponds more or less to Part I (Chapters 1-3) in Stock & Watson, and students are recommended to refresh their memory on this prior to the first lecture.

**Doelgroep**
This course in the minor Applied Econometrics is targeted at both econometrics and non-econometrics students that have knowledge of basic mathematics, probability and statistics.