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in Statistics**  
*Joint Masters Program in Berlin*  
[www.stat.de](http://www.stat.de)

# The Joint Master Program in Statistics of the Berlin Universities (HU, FU, TU) in cooperation with the Charité

## Participating Institutions:

- ▶ Wirtschaftswissenschaftliche Fakultät, Humboldt-Universität zu Berlin
- ▶ Mathematisch-Naturwissenschaftliche Fakultät (Institut für Mathematik), Humboldt-Universität zu Berlin
- ▶ Fachbereich Wirtschaftswissenschaft, Freie Universität Berlin
- ▶ Fakultät Wirtschaft & Management, Technische Universität Berlin
- ▶ Charité – Universitätsmedizin Berlin

# Why a Master in Statistics?

- ▶ Quantitative methods become more and more important.
- ▶ Growing need of well trained statisticians in economics, finance, insurance, biology, medicine, engineering, psychology ...
- ▶ Growing need for a specific training in statistical methods and statistical applications based on sound fundamentals in mathematics.
- ▶ Need for a self-contained degree in statistics.

# Fundamental Principle of the Master Program

- ▶ Pooling of resources, competence and excellence in mathematics, statistics, econometrics and biometrics in Berlin.
- ▶ Providing students much flexibility and a variety of alternative courses.
- ▶ Strong research orientation.
- ▶ Comprehensive background in mathematics.
  
- ▶ Modular system.
- ▶ Compulsory area ("Pflichtbereich").
- ▶ Disciplinary compulsory elective area ("Fachlicher Wahlpflichtbereich").
- ▶ Interdisciplinary compulsory elective area ("Überfachlicher Wahlpflichtbereich").

# General Structure: 120 ECTS credit points (CP) (1/2)

- (i) Compulsory courses in Methodological Foundations, Probability Theory, and Advanced Statistical Methods: 32 CP
- (ii) Two out of six fields of disciplinary compulsory electives (specialization tracks, each at least 15 CP)
  - ▶ I: Statistical Inference
  - ▶ II: Econometrics
  - ▶ III: Quantitative Methods of Financial Markets
  - ▶ IV: Survey Statistics
  - ▶ V: Applied Microeconometrics and Quantitative Economics
  - ▶ VI: Statistics in the Life Science
  - ▶ VII (in planning): Data Science

# General Structure: 120 ECTS credit points (SP) (2/2)

- (iii) Disciplinary compulsory elective modules (including (ii)):  
48 CP ( 18 CP ungraded)
- (iv) Interdisciplinary compulsory elective modules (10 CP):  
ungraded
- (v) Master Thesis (30 CP): To be presented in a seminar!
- (vi) Recommendation: One empirical study

# Compulsory Modules (32 CP)

- (i) Stochastics I (Probability Theory at Math. Level!) (10 CP)
- (ii) Linear Regression Model and Related Topics (10 CP)
  - ▶ Econometric Methods (10 CP) or
  - ▶ Statistical Methods (10 CP)
- (iii) Multivariate Statistics (6 SP)
  - ▶ Multivariate Statistical Analysis (6 SP) or
  - ▶ Multivariate Procedures (6 SP)
- (iv) Advanced Statistics (6 SP)
  - ▶ Advanced Statistics (6 SP) or
  - ▶ Advanced Econometrics (6 SP)

# Disciplinary Compulsory Elective Area

## Specialization track I: Statistical Inference

- ▶ Multivariate Statistics and Non- and Semiparametric Modelling (6 CP)
- ▶ Statistical Software and Data Analysis: two out of 5 modules (R, SAS, Statistical Programming Languages, Data Analysis I+II) with 6 CP each
- ▶ New Statistical Methods (6 CP)
- ▶ Current Research Topics in Statistics (Seminar) (6 CP)
- ▶ Mathematical Statistics (10 CP)
- ▶ Nonparametric Statistics (10 CP)
- ▶ Statistics of Stochastic Processes (5 CP)
- ▶ Statistical Consultation (6 CP)



# Specialization track II: Econometrics

- ▶ Microeconometrics (6 CP): 3 alternative courses
- ▶ Time Series Analysis (6 CP): 3 alternative courses
- ▶ Multivariate Time Series Analysis (6 CP)
- ▶ Econometric Analysis of Panel Data (6 CP): 2 alternative courses
- ▶ Econometric Analysis (6 CP)
- ▶ Analysis of Treatment Effects (6 CP): 2 alternative courses
- ▶ Introduction to Financial Econometrics (6 CP)
- ▶ Econometric Projects (6 CP)
- ▶ Selected Topics in Econometrics (6 CP)
- ▶ Current Research Topics in Econometrics (Seminar) (6 CP)

# Specialization track III: Quantitative Methods of Financial Markets

- ▶ Statistics of Financial Markets (6 CP)
- ▶ Advanced Methods in Quantitative Finance (6 CP)
- ▶ Selected Topics in Finance, Insurance and Mathematical Statistics (6 CP)
- ▶ Stochastic Financial Mathematics I (10 CP)
- ▶ Selected Topics of Financial and Actuarial Mathematics (5 CP)
- ▶ Introduction to Financial Econometrics (6 CP)

# Specialization track IV: Survey Statistics (1/2)

- ▶ Introduction to Survey Statistics (6 CP)
- ▶ Calibration and Weighting (6 CP)
- ▶ Variance Estimation (6 CP)
- ▶ Panel Surveys (6 CP)
- ▶ Small Area Estimation (6 CP)
- ▶ Introduction to Bayes Statistics (6 CP)
- ▶ Introduction to Multiple Imputation (6 CP)
- ▶ Simulation and Survey Sampling (6 CP)
- ▶ Seminar on Survey Sampling (6 CP)
- ▶ One (out of Two) Module on Statistical Software (6 CP)
- ▶ Statistical Consultation (6 CP)

Joint program in "Teleteaching" format with Univ. Bamberg and Trier.

# Specialization track IV: Survey Statistics (2/2)

## The Extra-certificate: European Master in Official Statistics (EMOS)

- ▶ Extra certificate granted by Eurostat (Statistical Agency of European Union)
- ▶ Master thesis + internship at Official Statistical Agency (Amt für Statistik Berlin-Brandenburg) (40 CP)
- ▶ Course on issues of Official Statistics (6 CP): This term!
- ▶ Courses related to EMOS learning outcomes (50 CP)

# Specialization track V: Applied Microeconometrics and Quantitative Economics

- ▶ Empirical Labor Economics (6 CP)
- ▶ Applied Predictive Analytics (6 CP)
- ▶ Business Analytics & Data Science (6 CP)
- ▶ Advanced Marketing Modelling (6 CP)
- ▶ Microeconometrics or Applied Microeconometrics (6 CP): 3 alternative courses
- ▶ Analysis panel data (6 CP): 2 alternative courses
- ▶ Analysis of treatment effects (6 CP): 2 alternative courses
- ▶ Panel Surveys (6 CP)
- ▶ Econometric Projects (6 CP)
- ▶ Selected Topics in Econometrics (6 CP)

# Specialization track VI: Statistics in Life Science (Biometry + Psychometrics)

- (1) Introduction to Biometry (5 CP)
- (2) Biometry (5 CP)
  - ▶ Multivariate Methods in Psychology (6 CP)
  - ▶ Research Seminar in Psychology (6 CP)
  - ▶ Statistical Consultation (6 CP)
- ▶ Currently, there is no course under the title (1) or (2). Instead, two of the following can be chosen:
  - ▶ Methods of Clinical Trials (5 CP)
  - ▶ Advanced Biometric Methods (5 CP)
  - ▶ Statistical Methods for Small Sample Sizes (5 CP)
  - ▶ Resampling Techniques and their Applications (5 CP)

# Specialization track VII: Data Science (in planning)

- ▶ In cooperation with TU Informatics
- ▶ TU Informatics: 7 modules on Machine Learning and Artificial Intelligence
- ▶ TU Economics: 1 module on Regression-based Statistical Learning
- ▶ HU School of Business and Economics: 6-7 modules on data analytics, machine learning etc.

# Other (Disciplinary) Compulsory Elective Modules

- ▶ Measure Theory (5 CP)
- ▶ Stochastics II (Stochastic Processes, 10 CP)
- ▶ All other modules from the specialization tracks I-VI
- ▶ All (master) modules of the School of Business and Economics at HU, in particular the following (planned for the track I):
  - ▶ Statistical Inference I+II (each 6CP)
  - ▶ Generalized Regression (6 CP)
  - ▶ Advanced Regression Modelling (6 CP)
  - ▶ Selected Topics in Statistics (6 CP)
  - ▶ Research Seminar in Statistics (6 CP)
  - ▶ Selected Topics in Quantitative Methods (6 CP)



# Interdisciplinary Compulsory Elective Area (ÜWP, 10 CP)

- ▶ This area is ungraded. If grades are obtained, they are not taken into account in the calculation of the overall score.
- ▶ The following are eligible for this area:
  - ▶ Generic electives (ÜWP) modules of other faculties of the HU
  - ▶ Interdisciplinary and professional courses from other universities (e.g. FU, TU) not listed in our study regulations
  - ▶ Interdisciplinary and professional courses from abroad
  - ▶ Language courses of the language centre (except language courses in the respective mother tongue or official language of the home country as well as German courses for foreigners and English courses under the level B2 GER)
  - ▶ Courses of the Career Centre (but no “elementary” statistics...)
  - ▶ Internship (10 CP): 6 weeks full-time or 12 weeks half-time during the Master’s; reference issued by company; report issued by student; seminar presentation

# Example of a Study Plan

Semester	Compulsory Modules	Disciplinary Compulsory Elective Modules		Interdisciplinary Compulsory Elective Modules	Credit Points
		Specialization	Others		
1 <sup>st</sup> Semester (Winter Term)	<ul style="list-style-type: none"> <li>Econometric Methods or Statistical Methods (10 ECTS)</li> <li>Multivariate Statistical Analysis (6 ECTS)</li> </ul>	2 Modules (each 6 ECTS)			28 ECTS
2 <sup>nd</sup> Semester (Summer Term)	<ul style="list-style-type: none"> <li>Stochastics I (10 ECTS)</li> <li>Advanced Statistics or Advanced Econometrics (6 ECTS)</li> </ul>	1 Module (6 ECTS) 1 Module (5 ECTS)	Measure Theory (5 ECTS)		32 ECTS
3 <sup>rd</sup> Semester (Winter Term)		1 Modules (10 ECTS)	1 Module (10 ECTS)	10 ECTS	30 ECTS
4 <sup>th</sup> Semester (Summer Term)	Master Thesis (30 ECTS)				30 ECTS
<b>ECTS total</b>	62 ECTS	48 ECTS		10 ECTS	120 ECTS

**Note:** The final grade is based on the compulsory modules (62 ECTS) and the best 30 ECTS of disciplinary compulsory elective modules.

# Approvals of External Course Achievements

- ▶ Generally approval of compulsory courses already taken in other programs
- ▶ Generally no credit points for courses required for a previous degree
- ▶ Credit points have to be earned by courses on top of those already completed
- ▶ Official applications on course/credit approvals to examination board (Prüfungsausschuss)
  - ▶ Application forms are available on our website [www.stat.de](http://www.stat.de)

# Admission and Registration

- ▶ Besides the admission at the individual universities (HU, FU, TU) each student must be enrolled at HU.
  - ▶ The examination administration is at HU!
- ▶ Please register in the HU Moodle System (link on [www.stat.de](http://www.stat.de)).
  - ▶ For quick information!
- ▶ You will need “local” enrollment number (at TU and/or FU) to get access to local computing accounts, the local learning management system (for example Blackboard at FU), etc.
  - ▶ No additional fees involved!

# Study and Examination Regulations

- ▶ Official documents: see website [www.stat.de](http://www.stat.de) for a link
  - ▶ complete list of modules
  - ▶ module descriptions
- ▶ For any exam (including registration process), apply the rules of the university/faculty which offers the course.

# Study Guidance & Contact

- ▶ Student consultancy according to individual background
- ▶ Head of Joint Commission: Prof. Sonja Greven, HU
- ▶ Head of Examination Board: Prof. Timo Schmid, FU
- ▶ Representatives of different institutions and fields:
  - ▶ Prof. Sonja Greven, HU, Statistics & Econometrics
  - ▶ Prof. Timo Schmid, FU, Statistics & Econometrics
  - ▶ Prof. Markus Reiss, HU, Mathematics
  - ▶ Prof. Geraldine Rauch, Charité, Biometry
  - ▶ Prof. Axel Werwatz, TU, Statistics & Econometrics
- ▶ General Consultancy: Prof. Bernd Droge, HU
- ▶ Joint commission: see <https://www.stat.de/contact/>

# Information Platforms and Networking



- ▶ Homepage: [www.stat.de](http://www.stat.de)
- ▶ Moodle webpage. Please sign in!
- ▶ There exists a facebook group
- ▶ alumni network: see homepage
- ▶ Student members in the Joint Commission: Franziska Wehrmann and Lars Heiliger (Deputy: Lukas Mödl)
  - ▶ Are you interested in becoming a member of the commission?