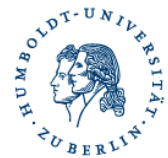
Freie Universität Berlin CHARITÉ UNIVERSITÄTSMEDIZIN BERLIN HUMBOLDT-UNIVERSITÄT ZU BERLIN

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. The importance of data is on the rise.
- Growing need for well trained statisticians in economics, finance, insurance, biology, medicine, psychology, engineering, ...
  - Also visible in the Covid-19 pandemic, with Statistics needed to nowcast infections, forecast intensive care unit needs, estimate underreporting of cases, analyse virus loads in children compared to adults, . . . , while accounting for uncertainty.
- Demand for training in statistical methods based on sound mathematical foundations, coupled with competencies in statistical applications and data analysis.
- Need for a self-contained degree in statistics.

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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”).

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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 seven 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 Sciences
- VII: 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: At least one empirical study

Compulsory Modules (32 CP)

(a) Stochastik I (Probability Theory at Math. Level!) (10 CP, HU)

(b) Linear Regression Model and Related Topics (10 CP)

- Econometric Methods (10 CP, HU) or
- Methoden der Statistik (10 CP, HU)

(c) Multivariate Statistics (6 SP)

- Multivariate Statistical Analysis (6 SP, HU) or
- Multivariate Verfahren (6 SP, HU)

(d) Advanced Statistics (6 SP)

- Advanced Econometrics (6 SP, HU) or
- Statistik für Fortgeschrittene[1] (6 SP, FU)

[1] If not offered, Statistical Inference II (6 SP, HU) can be recognized by the examination board. Course Equivalency Form on stat.de.

Disciplinary Compulsory Elective Area
Specialization track I: Statistical Inference (1/2)

- Multivariate Statistics and Non- and Semiparametric Modelling (6 CP)
- Statistical Software and Data Analysis: ≤ 2 out of 4 modules (Computer-assisted Statistics, 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 I: Statistical Inference (2/2)

- Statistical Inference I + II (6 CP each)
- Generalized Regression (6 CP)
- Advanced Regression Modelling (6 CP)
- Selected Topics in Statistics (6 CP)
- Research Seminar in Statistics (6 CP)
- Projektpraktikum II (Stochastik) (5 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)
- Multivariate Time Series 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

- Time Series Analysis (6 CP): 3 alternative courses
- Multivariate Time Series Analysis (6 CP)
- Introduction to Financial Econometrics (6 CP)
- Stochastic Financial Mathematics I+II (10 CP each)
- Selected Topics of Financial and Actuarial Mathematics (5 CP)
- Stochastics II (10 CP)
- Selected Topics in Quantitative Finance (6 CP)
- Statistics of Stochastic Processes (5 CP)
- Selected Topics in Stochastics (5 CP)

Specialization track IV: Survey Statistics (1/2)

- Introduction to Survey Statistics (6 CP)
- New Statistical Methods (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 Statistics (6 CP)
- Module on Statistical Software (6 CP)
- Statistical Consultation (6 CP)
- Selected Topics in Survey Statistics (6 CP)

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

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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! Register via Email to Ulrich.rendtel@fu-berlin.de and at the Virtual Campus Bamberg.
- 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 of 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 (Applied) Econometrics (6 CP each)

Specialization track VI: Statistics in the Life Sciences (Biometrics + Psychometrics)

- Statistics for Biosciences II (8 CP)
- Multivariate Methods in Psychology[1] (6 CP)
- Research Seminar in Psychology[1] (6 CP)
- Statistical Consultation (6 CP)
- 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)
- Selected Topics in Statistics in the Life Sciences (6 CP)

[1] Psychometrics courses changing, in case of questions email Manuel Völkle.

Specialization track VII: Data Science (1/2)

Partly in cooperation with TU Informatics:

- Machine Learning 1+2 (9 CP each)
- Artificial Intelligence: Foundations and applications (6 CP)
- AI: Foundations, applications and seminar (9 CP)
- Monte Carlo Methods in Artificial Intelligence and Machine Learning (6 CP)
- Probabilistic and Bayesian Modelling in Machine Learning and Artificial Intelligence (6 CP)
- Projects in Machine Learning and Artificial Intelligence (6 CP)
- Regression-based statistical learning with R (6)
- Statistical and Machine Learning (6 CP)

Specialization track VII: Data Science (1/2)

- Advanced Data Analytics for Management Support (6 CP)
- Seminar Information Systems (6 CP)
- Selected Topics in Data Science (6 CP)
- Research Seminar in Data Science (6 CP)
- Introduction to Natural Language Processing (6 CP)
- Applied Predictive Analytics (6 CP)
- Business Analytics & Data Science (6 CP)
- Machine Intelligence I+II (6 CP each)

Other (Disciplinary) Compulsory Elective Modules

- Measure Theory (5 CP)
- Stochastics II (Stochastic Processes, 10 CP)
- All other modules from the specialization tracks I-VII
- All (master) modules of the School of Business and Economics at HU
- Nutzung der Amtlichen Statistik in den Wirtschafts- und Sozialwissenschaften

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 below 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**		
1st Semester (Winter Term)	• Econometric Methods or Statistical Methods (10 ECTS) • Multivariate Statistical Analysis (6 ECTS)	2 Modules (each 6 ECTS)			28 ECTS
2nd Semester (Summer Term)	• Stochastics I (10 ECTS) • Advanced Statistics or Advanced Econometrics (6 ECTS)	1 Module (6 ECTS) 1 Module (5 ECTS)	Measure Theory (5 ECTS)		32 ECTS
3rd Semester (Winter Term)		1 Modules (10 ECTS)	1 Module (10 ECTS)	10 ECTS	30 ECTS
4th Semester (Summer Term)	Master Thesis (30 ECTS)				30 ECTS
ECTS total	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

Admission and Registration

- In addition to 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`).
  - For quick information and material!
- 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` for a link
  - complete list of modules
  - module descriptions
- For any exam (including registration process), the rules of the university/faculty which offers the course apply!

Plagiarism and Scientific Misconduct

- Plagiarism or scientific misconduct can be a problem if **sources are not properly referenced**.
- Typically in seminar papers, assignments or Master theses.
- Usually leads at least to a failing grade.

Resources for learning about scientific writing and proper citations:

- Students' Guide How to Write a Scientific Work (https://www.wiwi.hu-berlin.de/de/studium/sb/leitfaden.pdf)
- Courses on Scientific Writing and English for Scientific Writing (credits can be used in the ÜWP, the Interdisciplinary compulsory elective area!)

We highly recommend familiarizing yourself with the topic!

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Study Guidance & Contact

- Student consultancy according to individual background
- Head of Joint Commission: Prof. Sonja Greven, HU
- Head of Examination Board: Prof. Axel Werwatz, TU

- Representatives of different institutions and fields:
  - Prof. Sonja Greven, HU, Statistics & Econometrics
  - Prof. Lars Winkelmann, FU, Statistics & Econometrics
  - Prof. Markus Reiss, HU, Mathematics
  - Prof. Frank Konietschke, Charité, Biometry
  - Prof. Axel Werwatz, TU, Statistics & Econometrics
- General Consultancy: Prof. Greven / Dr. Sigbert Klinke, HU, mscstatistics@lists.hu-berlin.de
- Joint commission: see https://www.stat.de/contact/

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Information Platforms and Networking

Homepage: www.stat.de. In addition to information, documents and news, it includes links to the following:

- an FAQ with answers to many frequently asked questions.
- Master Statistics Moodle course. Please sign in to get important updates!
- a student facebook group.
- an Alumni network.
- Contact information for the student members in the Joint Commission: Max von Münster and Lea Runge
  - Are you interested in becoming a member of the commission?

Open position

Opening for a student assistant at the Chair of Statistics at HU.

Assistance in the new DFG-funded research unit KI-FOR 5363 "Fusing Deep Learning and Statistics towards Understanding Structured Biomedical Data".

Applications until Friday to stat@wiwi.hu-berlin.de.

https://www.stat.de/archives/5754