Faculty of Economic Sciences:

Following the resolution of the Faculty Council of the Faculty of Economic Sciences dated 07.02.2024, the Presidential Board of University of Göttingen approved the twentieth amendment to the examination and study regulations for the consecutive Master's degree programme "Applied Statistics" on 03.04.2024 in the version published on 28.03.2013 (Official Announcements I no. 14/2013, p. 355), last amended by resolution of the Presidential Board dated 24.08.2023 (Official Announcements I no. 26/2023, p. 872), (§ 44 section 1 sentence 2 NHG in the version contained in the announcement dated 26.02.2007 (Nds. GVBI. p. 69), last amended by Article 12 of the Act dated 15.12.2023 (Nds. GVBI. p. 320); § 37 section 1 sentence 3 no. 5 b) NHG, § 44 section 1 sentence 3 NHG).

Examination and study regulations for the consecutive Master's degree programme "Applied Statistics" at the University of Göttingen

§ 1 Scope and faculties involved

(1) The provisions of the "General examination regulations for Bachelor's and Master's degree programmes and other and degree programmes offered by the University of Göttingen" (APO), as well as the "General examination and study regulations for Master's degree programmes of the Faculty of Economic Sciences" (RPO-MA), in the respective current version, apply to the consecutive Master's degree programme "Applied Statistics" at Georg-August-Universität Göttingen.

(2) These regulations stipulate the additional provisions for the Master's degree programme.

(3) The Master's degree programme "Applied Statistics" is offered jointly by the Faculty of Economic Sciences and the Faculty of Medicine. The umbrella faculty is the Faculty of Economic Sciences. Changes to these regulations are decided by the Faculty Council of the Faculty of Economic Sciences at the suggestion of the Advisory Board of the Faculty of Economic Sciences. Before any corresponding resolutions are passed, the Faculty Council of the Faculty of Medicine must be given suitable opportunity for deliberations.

§ 2 Aim of the qualification

[1]Besides the general aims of the course of studies defined in the RPO-MA, graduates acquire in-depth knowledge of statistical analysis and modelling, taking into account the latest

specialised developments and changed requirements of the professional world. [2]Applied Statistics is a key discipline in all areas that deal with the collection, analysis and integration of data. [3]It develops general methods and tools with which, among other things, large and complex data volumes from various sources can be responsibly and objectively translated into information and knowledge. [4]The Master's degree programme therefore imparts modern statistical knowledge to Bachelor's graduates from various disciplines and thus reflects the classic bridging function of statistics: [5]Starting with in-depth knowledge in one area of application and basic knowledge of statistics, the Master's degree programme provides in-depth knowledge, which in turn benefits the strengthening of the empirical foundation of the respective areas of application. [6]Students have the opportunity to specialise in one of four application areas (economics, life sciences, social sciences, machine learning) and to combine the specialist knowledge they have acquired with in-depth knowledge of these application areas. [7]On the basis of the acquired competences, graduates are able to exploratively assess data from different areas, analyse it statistically, critically examine the suitability and limits of different procedures and thus select the most suitable procedure for a given issue, prepare the results obtained, and communicate them to a broad public. [8]They can also include ethical and social aspects in the assessment. [9]After completing their course of studies, graduates can thus take up high professional positions nationally or internationally or progress to doctoral studies.

§ 3 Recommended prior knowledge

For the Master’s degree programme, it is very beneficial to have subject-specific computer skills. Students with poor computer skills are advised to engage in appropriate learning before beginning the course of studies.

§ 4 Content structure of the Master's programme and credit requirements

(1) The 120 C to be completed in the Master's degree programme in Applied Statistics in a standard period of study of four semesters are made up as follows:

1.	compulsory area	42 C
2.	compulsory elective area	32-36 C
3.	statistical internship	6 C
4.	key qualifications	6-10 C
5.	Master's thesis	30 C

(2) The compulsory area provides basic knowledge of statistical inference, statistical models and statistical programming and covers the following subject areas:

- Mathematical foundations of applied statistics

- Methods of advanced statistical inference
- Linear models and their mathematical foundations
- Introduction to statistical programming
- Generalised linear models
- Advanced statistical programming with R
- Data protection and data ethics in applied statistics.

(3) The compulsory elective area provides in-depth knowledge of statistical modelling (18 C in total) and statistical specialisations in relation to a chosen field of application (14-18 C). The fields of application can be economics, life sciences, empirical social research and machine learning.

(4) As part of the statistical internship, students work in groups of up to four people in cooperation with a practice partner to develop statistical solutions to a given problem. The results of the internship are presented in a colloquium and summarised in a project report.

(5) [1]The number, type and scope of the modules to be successfully completed are regulated in the module overview (Appendix I). [2]The module catalogue and module handbook are published separately in a joint electronic version (digital module directory); they are an integral part of these regulations, insofar as the modules are listed in the module overview (Appendix I).

(6) A prerequisite for admission to the Master's thesis is the acquisition of 33 C from the compulsory area. The Master's thesis takes 20 weeks to complete. Part of the Master's thesis is participation in a research colloquium in which the student's own work is presented.

(7) Appendix II provides a schematic overview of the Master's degree programme in Applied Statistics and contains a suggested timetable.

§ 5 Entry into Force

(1) These regulations shall enter into force following their announcement in the Official Announcements I of Georg-August-Universität Göttingen as of 01/10/2013.

(2) [1]Students who commenced their course of studies before an amendment to these examination and study regulations came into force and who have remained enrolled therein without interruption will be examined on the basis of the examination and study regulations in place before the amendments came into force. [2]In the case of pending examinations, this does not apply to module overviews and descriptions, unless the legal entitlements of a student calls for a different decision by the examination board. [3]A different decision can be reached especially in cases where an examination component can be repeated, or a compulsory or optional required module has changed significantly or been cancelled. [4]The examination board

can draw up general rules for this purpose. [5]Examinations based on a version valid prior to the coming into force of an amendment to the existing examination and study regulations will be conducted for the last time in the fourth semester following the amendment has come into force. [6]On application, students affected by sentence 1 shall be examined in general on the basis of the amended regulations.

Appendix I: Module overview

A total of at least 120 C must be successfully completed in accordance with the following provisions; modules that have already been successfully completed in the Bachelor's programme cannot be taken again.

1. Compulsory area (42 C)

The following modules with a rating of 42 C in total should be successfully completed. Modules that were already completed successfully as part of the Bachelors programme do not count. Alternatively, modules should be successfully completed in accordance with no. 2 letter a.

M.MED.0010	Mathematical Foundations of Applied Statistics	6 C
M.WIWI-QMW.0002	Advanced Statistical Inference (Likelihood & Bayes)	6 C
M.MED.0001	Linear Models and their mathematical Foundations	9 C
M.WIWI-QMW.0021	Introduction to Statistical Programming	3 C
M.WIWI-QMW.0001	Generalized Regression	6 C
M.WIWI-QMW.0011	Advanced Statistical Programming with R	9 C
M.WIWI-QMW.0038	Data protection and data security in applied statistics	3 C

2. Compulsory elective area (32-36 C)

Modules totalling at least 32 C and a maximum of 36 C must be successfully completed in accordance with the following provisions:

a. Advanced Statistical Modelling (18 C)

From the following modules for Advanced Statistical Modelling, a total of three modules with a rating of 18 C in total must be successfully completed:

M.WIWI-QMW.0004	Econometrics I	6 C
M.WIWI-QMW.0005	Econometrics II	6 C
M.WIWI-QMW.0009	Introduction to Time Series Analysis	6 C
M.WIWI-QMW.0010	Multivariate Statistics	6 C
M.WIWI-QMW.0012	Multivariate Time Series Analysis	6 C
M.WIWI-QMW.0016	Spatial Statistics	6 C
M.WIWI-QMW.0033	Current Topics in Applied Statistics	6 C
M.WIWI-QMW.0035	Statistical and Deep Learning	6 C
M.WIWI-QMW.0036	Economic and Business Forecasting	6 C
M.WIWI-QMW.0037	Advanced Bayesian Inference	6 C
M.WIWI-QMW.0041	Stochastic Processes	6 C
M.WIWI-QMW.0042	Computational Statistics	6 C
M.WIWI-BWL.0139	Discrete Choice Modelling	6 C
M.MED.0002	Longitudinal Data	6 C

M.MED.0003	Event Time Analysis	6 C
M.MED.0011	Nonparametric procedures	6 C
M.Inf.1501	Data Mining in Bioinformatics	6 C
M.Inf.2102	Advanced Statistical Learning for Data Science	6 C
M.Inf.2103	Statistical Network Inference and Analysis	6 C
M.Inf.2201	Probabilistic Machine Learning	9 C
B.Inf.1236	Machine Learning	6 C
B.Inf.1237	Deep Learning for Computer Vision	6 C

b. Specialisation (14-18 C)

Students must successfully complete modules of at least 14 C and a maximum of 18 C from specialisations related to a chosen field of application. The fields of application are economics, life sciences, empirical social research and machine learning.

aa. Specialisation in Economic Sciences

At least 3 of the following modules totalling a minimum of 14 C and a maximum of 18 C must be successfully completed.

M.WIWI-BWL.0001	Sustainable Finance	6 C
M.WIWI-BWL.0004	Financial Risk Management	6 C
M.WIWI-BWL.0080	Market Research II	6 C
M.WIWI-BWL.0134	Panel Data Analysis in Marketing	6 C
M.WIWI-BWL.0139	Discrete Choice Modeling	6 C
M.WIWI-BWL.0163	Methods of empirical accounting and capital market research	6 C
M.WIWI-BWL.0164	Seminar International Financial Governance	6 C
M.WIWI-BWL.0170	Advanced Research Methods	6 C
M.WIWI-BWL.0172	Empirical research on sustainability reporting	6 C
M.WIWI-QMW.0004	Econometrics I	6 C
M.WIWI-QMW.0005	Econometrics II	6 C
M.WIWI-QMW.0009	Introduction to Time Series Analysis	6 C
M.WIWI-QMW.0010	Multivariate Statistics	6 C
M.WIWI-QMW.0012	Multivariate Time Series Analysis	6 C
M.WIWI-QMW.0013	Applied Econometrics	6 C
M.WIWI-QMW.0025	Development Microeconomics	6 C
M.WIWI-QMW.0027	Advanced Meta-Research in Economics	6 C
M.WIWI-QMW.0034	Python for Econometrics	6 C
M.WIWI-QMW.0036	Economic and Business Forecasting	6 C

M.WIWI-QMW.0039	Seminar Economic and Business Forecasting	6 C
M.WIWI-QMW.0040	Introduction to Statistical Methods in Economic Sciences	6 C
M.WIWI-VWL.0008	Development Economics I: Macro Issues in Economic Development	6 C
M.WIWI-VWL.0009	Development Economics II: Micro Issues in Economic Development	6 C
M.WIWI-VWL.0040	Empirical Trade Issues	6 C
M.WIWI-VWL.0041	Panel Data Econometrics	6 C
M.WIWI-VWL.0054	Behavioral Game Theory	6 C
M.WIWI-VWL.0096	Essentials of Global Health	6 C
M.WIWI-VWL.0099	Poverty & Inequality	6 C
M.WIWI-VWL.0113	Macroeconometrics	6 C
M.WIWI-VWL.0147	Empirical Political Economy	6 C
M.WIWI-VWL.0150	Game Theory	6 C
M.WIWI-VWL.0175	International Development Policy	6 C
M.WIWI-VWL.0183	Geospatial Analysis for Development Economics	6 C
M.WIWI-VWL.0184	Empirical Analysis of Conflict and Development	6 C
M.WIWI-WB.1000	Internship	6 C
M.WIWI-WIN.0026	Machine Intelligence: Concepts and Applications	6 C
M.WIWI-WIN.0038	Digital Health	6 C
B.Mat.3043	Non-life insurance mathematics	6 C
B.Mat.3044	Life insurance mathematics	6 C
M.SIA.E19	Market Integration and price transmission I	6 C

bb. Specialisation in Life Sciences

At least 3 of the following modules totalling a minimum of 14 C and a maximum of 18 C must be successfully completed.

M.MED.0002	Longitudinal Data	6 C
M.MED.0003	Event Time Analysis	6 C
M.MED.0004	Clinical Studies	6 C
M.MED.0005	Statistical Methods in Bioinformatics	6 C
M.MED.0006	Genetic Epidemiology	6 C
M.MED.0008	Fundamentals of application to the areas of life sciences/medicine/health care research	3 C
M.MED.0011	Nonparametric procedures	6 C
M.MED.0021	Experimental Design and Causal Inference	6 C

B.Inf.1504	Maschine Learning in Bioinformatics	6 C
B.Inf.301.2	Medical Documentation	3 C
M.Inf.2103	Statistical Network Inference and Analysis	6 C
M.MM.001	Epidemiology	4 C
M.WIWI-QMW.0010	Multivariate Statistics	6 C
M.WIWI-WB.1000	Internship	6 C
M.WIWI-WIN.0038	Digital Health	6 C
M.Agr.0068	Quantitative-genetical methods in animal breeding	6 C

The following modules can also be taken if the admission requirements are met and teaching capacity is available. Possible free places for these highly sought-after modules can be requested from the respective lecturers:

M.iPAB.0001	Quantitative genetics and population genetics	6 C
M.iPAB.0006	Breeding informatics	6 C
M.iPAB.0013	Selection theory, design and optimization of breeding programs	6 C

cc. Specialisation in Empirical Social Research:

i. The following module with a rating of 6 C must be successfully completed:

M.MZS.12	Methods of Data Collection in Quantitative Social Research	6 C

ii. At least one of the following modules totalling a minimum of 8 C and a maximum of 12 C must be successfully completed:

M.MZS.11	Conception and planning of empirical research projects	6 C
M.Pol.200	Advanced Political Theory and International Relations	12 C
M.Pol.300	Advanced Comparative Politics and German Politics	12 C
M.Soz.200	Methods of Comparative Research	6 C
M.Soz.100	Macrosociological Theories	6 C
M.Soz.30a	Work and Social Structure (Overview Module)	6 C
M.Soz.40a	Political Sociology and Social Policy (Overview Module)	6 C
M.Soz.50a	Sociology of Culture (Overview Module)	6 C
M.WIWI-WB.1000	Internship	6 C

The following module can also be taken if the admission requirements are met and teaching capacities are available. Possible free places for this highly demanded module can be requested from the respective lecturers:

M.MZS.13	Possible applications and limitations of multivariate data analysis	6 C

dd. Machine Learning:

Modules totalling at least 14 C and a maximum of 18 C must be successfully completed. All modules according to Appendix I Number 1) ("Specialised Studies") of the module directory of the Master's degree programme "Applied Computer Science" can be selected. The following modules are recommended:

B.Inf.1210	Computer Security and Privacy	5 C
B.Inf.1236	Machine Learning	6 C
B.Inf.1237	Deep Learning for Computer Vision	6 C
B.Inf.1241	Computational Optimal Transport	6 C
B.Inf.1802	Training in Programming	5 C
B.Inf.1842	Programming for Data Scientists II	5 C
B.Inf.1913	Advanced Topics in Computational Linguistics	6 C
B.Mat.0720	Mathematical application software (Basics)	3 C
M.Inf.1139	Privacy-Enhancing-Technologies	5 C
M.Inf.2102	Advanced Statistical Learning for Data Science	6 C
M.Inf.2103	Statistical Network Inference and Analysis	6 C
M.Inf.2201	Probabilistic Machine Learning	9 C
M.Inf.2202	Deep Learning for Natural Language Processing	6 C
M.Inf.2241	Current Topics in Machine Learning	5 C
M.WIWI-QMW.0010	Multivariate Statistics	6 C
M.WIWI-QMW.0034	Python for Econometrics	6 C
M.WIWI-QMW.0035	Statistical and Deep Learning	6 C
M.WIWI-WB.1000	Internship	6 C
M.WIWI-WIN.0008	Change & Run IT	6 C
M.WIWI-WIN.0026	Machine Intelligence: Concepts and Applications	6 C
M.WIWI-WIN.0036	Design of Software Architectures	6 C

3. Statistical internship (6 C)

The following module with a rating of 6 C should be successfully completed.

M.WIWI-QMW.0020	Practical Statistical Training	6 C

4. Elective area (6-10 C)

Modules totalling at least 6 C and a maximum of 10 C must be successfully completed in accordance with the following provisions.

a. Modules from the University's range of Spokespersons, insofar as these are modules that provide a language level equivalent to level B according to the Common European Framework of Reference for Languages (CEFR) and insofar as the modules have not already been included in a previously completed degree programme. Notwithstanding sentence 1, modules relating to German, English and the student's native language are excluded.

b. Modules with the identifiers M.WIWI-BWL, M.WIWI-QMW, M.WIWI-HGM, M.WIWI-VWL, M.WIWI-WB, M.WIWI-WIN and M.WIWI-WIP

c. Modules from the following list of module groups and modules and from the central key competence programme of the University of Göttingen, provided that the admission requirements specified there are met. Modules with the initial identifier SK.AS will only be considered up to a maximum total of 7 C; modules will not be considered on a pro rata basis; a module with which the maximum total of 7 C is exceeded can only be considered as a voluntary additional examination.

SK.AS.BK	Modules Competences for professional integration	
SK.AS.FK	Modules Leadership competences	
SK.AS.KK	Modules Communicative competences	
SK.AS.SK	Social skills modules	
SK.AS.WK	Modules Knowledge and personal competences	
SK.GB.02	Communicative competence: Gender and Diversity competence in communication	3 C
B.Inf.1101	Fundamentals of Computer Science and Programming	10 C
B.Inf.1206	Databases	5 C
B.Inf.1211	Sensor data processing	5 C
B.Inf.1231	Infrastructures for Data Science	6 C
B.Inf.1235	Text Mining	5 C
B.Inf.1801	Programming course	5 C
B.MZS.03	Introduction to Empirical Social Research	6 C
B.MZS.22	Computer-aided data analysis II	4 C
B.Phy.5629	Nonlinear dynamics and time series analysis	6 C
M.Agr.0197	Sustainability - basics and application	6 C
M.Inf.1351	Working methods in health research	5 C
M.Inf.1800	Practical Course Advanced Networking	6 C
M.Inf.1802	Practical course XML	6 C
M.Inf.1804	Practical Course in Software Quality Assurance	6 C
M.Inf.2241	Current Topics in Machine Learning	5 C
M.MED.0004	Clinical Trials	6 C

M.MED.0008	Fundamentals of the application to the fields of Life sciences/medicine/health services research	3 C
M.Phy.562	Advanced Topics in Biophysics/Physics in Complex Systems II: Pattern Recognition and Machine Learning	6 C

Modules with the identifier B.Mat.XXXX can be selected, with the exception of modules B.Mat.0730, B.Mat.0740, B.Mat.0970, modules with the identifier B.Mat.32XX and modules with the identifier B.Mat.34XX.

The following module can also be taken if the admission requirements are met and teaching capacity is available. Possible free places for this module, which is in high demand, can be requested from the respective lecturers:

B.Geg.04-1	Geoinformatics 1	5 C

d. Other modules (alternative modules) may be taken in the elective area and in area 2.b. Specialisations instead of the modules mentioned in accordance with the following provisions. Prerequisites for the consideration of an alternative module are:

da. a written application by the student, which must be submitted to the Dean of Studies of the Faculty of Business and Economics before taking the alternative module;

db. the approval of the Dean of Studies of the faculty or teaching unit offering the alternative module.

The decision on the approval of the application is made by the Dean of Studies of the Faculty of Business and Economics. Before making the decision, the Dean of Studies will obtain an opinion on the appropriateness of the module replacement from lecturers of the degree programme in which the student is enrolled. The application may be rejected without stating reasons; the student making the application has no legal claim. The consideration of a module that has already been completed as an alternative module is excluded.

5. Master's thesis

30 C are awarded for successful completion of the master's thesis.

Appendix II: Graphic of the recommended course of study