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TRANSLATION OF

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Administrative Bulletin of the Public Sector and the Foundation

Only the German version of the Leuphana Gazette is legally binding. The English version is provided solely for information purposes.

— Second Amendment of the Subject-Specific Annex 6.3 Master Management & Data Science to the Framework Examination Regulations for the Master Programs at the Graduate School of Leuphana University Lüneburg
— New announcement of the subject-specific appendix 6.3 Master Management & Data Science to the Framework Examination Regulations for the Master Programs at the Graduate School of Leuphana University Lüneburg

Second Amendment of the Subject-Specific Annex 6.3 Master Management & Data Science to the Framework Examination Regulations for the Master Programs at the Graduate School of Leuphana University Lüneburg

Based on § 44 para. 1 sentence 2 NHG, the Faculty Council of the Faculty of Management and Technology has adopted on April 13, 2022 the following second amendment to the subject-specific Annex 6.3 Master Management & Data Science of December 3, 2014 (Leuphana Gazette No. 6/15 of 23. April 2015) in the now applicable version to the Framework Examination Regulations for the Master's Programs at the Graduate School of Leuphana University of Lüneburg of February 18, 2015 (Leuphana Gazette No. 22/15 of June 25, 2015) as amended by the Third Amendment of November 20, 2019 (Leuphana Gazette No. 20/20 of March 31, 2020). The Presidential Board of Leuphana University Lüneburg approved this amendment pursuant to Section 44 (1) Sentence 3 and Section 37 (1) Sentence 3 No. 5b) NHG on April 27, 2022.

SECTION I

The Subject-Specific Annex 6.3 Master Management & Data Science to the Framework Examination Regulations for the Master Programs at the Graduate School of Leuphana University of Lüneburg is amended as follows:

(1) The remarks "on Section 3 (6)" are amended as follows:
   a) The module outline is amended as follows:
      a. "Software for Analyzing Data" is changed to " Applied Statistical Data Analysis "
   b) The section beginning with "In Semester 1: ..." is changed to "Software for Analyzing Data" to "Applied Statistical Data Analysis".
(2) The module table "1st Semester Modules in the Management & Data Science Major" is amended as follows:
   a) The module "Software for Analysing Data" is changed as follows: The module name is now "Applied Statistical Data Analysis". In the column Contents it reads new "Students will gain an overview of analytical and statistical tools. The module also introduces students to the programming language R and the basics of analysis with R, tying this in with several essential concepts of data science. Students will gain an overview of available analytical and statistical tools. The module also introduces students to the programming language R and the basics of analysis with R, tying this in with several essential concepts of data science."
(3) The section entitled "Effective Date" is amended to read as follows:
   This subject-specific annex will enter into force after its approval by the Presidential Board of Leuphana University Lüneburg following its publication in the official bulletin of Leuphana University Lüneburg for the winter semester 2022/23.

SECTION II

This amendment shall enter into force after its approval by the Presidential Board of Leuphana University Lüneburg on the day after its announcement in the Official Gazette for the winter semester 2022/23.

Re-announcement of the Subject-Specific Annex 6.3 Master Management & Data Science to the Framework Examination Regulations for the Master's Programs at the Graduate School of Leuphana University Lüneburg

For students starting their studies from the winter semester 2015/16

On April 13, 2022, the Faculty Council of the Faculty of Management and Technology at Leuphana University of Lüneburg adopted the following amendment to the subject-specific Annex 6.3 Master Management & Data Science of December 3, 2014 (Leuphana Gazette No. 6/15 of 23. April 2015) to the Framework Examination Regulations for the Master's Programs at the Graduate School of Leuphana University of Lüneburg of February 18, 2015 (Leuphana Gazette No. 22/15 of June 25, 2015) as amended by the Third Amendment of November 20, 2020 (Leuphana Gazette No. 20/20 of March 31, 2020). The Presidential Board approved this Subject-Specific Annex on April 27, 2022 in accordance with Section 37 (1) Sentence 3 No. 5 b NHG.

Section I

The regulations of the framework examination regulations for the Master's programs at the Graduate School of the Leuphana University of Lüneburg are supplemented as follows:

to § 3 para. 6, details on the structure and content of the subject-specific area of the Master:

Module overview Master Management & Data Science
(see also the subject-specific appendix 6.1 Management Studies as well as the subject-specific appendix 8 Complementary Studies.

Semester 4	Master- Forum	Master thesis				
Semester 3	Management Studies	Elective module	Elective module	Research Project	Data Privacy and Ethics	Complementary studies
Semester 2	Management Studies	Deep Learning	Probabilistic Modeling	Analyzing Networks	Forecasting and Simulation	Complementary studies
Semester 1	Management Studies	Learning from Data	Mathematical Foundation	Applied Statistical Data Analysis	Data Economy	Complementary studies

The following four compulsory modules must be completed in the 1st semester:
- Learning from Data
- Mathematical Foundation
- Applied Statistical Data Analysis
- Data Economy

In the **2nd semester, the** following four compulsory modules must be completed:
- Deep Learning
- Probabilistic Modeling
- Analyzing Networks
- Forecasting and Simulation.

In the **3rd semester, the** following two mandatory modules must be completed:
- Data Privacy and Ethics
- Research Project.

Students must complete a total of 2 additional elective modules in the 3rd semester. Major-specific modules from the following catalog are offered for this purpose:
- Data Science Seminar
- Special Topics in Data Science

Alternatively, a maximum of two elective modules from other masters of the Management master's program can be taken.

Regarding § 2, Aim of the study program, purpose of the examination
The Master's program in Management & Data Science is designed for students who want to enhance their skills in data analysis of real-world phenomena. Graduates are able to analyze massive and complex data sets, develop and implement statistical models based on modern information technology, and derive appropriate measures. In addition, the program offers interdisciplinary teaching and research that enables students to acquire application-oriented knowledge for practical management solutions. By integrating management, data analysis, and information systems knowledge, graduates can develop the latest innovative solutions for managing information-driven businesses. This prepares graduates to take on roles in analysis, design, consulting, and strategic work.

Regarding § 5, Determination of the Academic Degree
Master of Science

to § 6 para. 3, language of teaching and examination

The Master Management & Data Science is offered in English. The teaching and examination language of the major is English.

to § 7 para. 1, examination performance in the master forum (colloquium)

The examination to be taken in the Master Forum (Colloquium) of the Master Data Science is ungraded and therefore to be graded as "passed" or "failed".

to § 8 Para. 1, Processing time of the Master's thesis

The processing time for the Master's thesis is twenty weeks.

to § 8 Para. 8, Oral Examination

An oral examination is conducted in addition to the Master's thesis. The grade for the oral examination is to be included with a share of one fifth in the overall grade of the Master's thesis.

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Modules of the 1st semester in Master Management & Data Science

Module	Content	Types of taught-components (type and number of course, CH)	Module requirements	CP	Commentary
Mandatory modules					
Mathematical Foundation (Ma-DS-1)	his module teaches students fundamental mathematics in the following fields: theory of probability and statistics (descriptive statistics, parameter estimation, statistical test procedures, distributions, regression), linear algebra (vector spaces, orthogonality, determinants, eigenvalues and eigenvectors) and stochastic processes (Markov chains).	1 Lecture (2 CH) and 1 Exercise (2 CH)	Written examination (90 min)	5	
Learning from Data (Ma-DS-2)	This module teaches basic theory and skills for statistical learning. These include linear models (regression and classification), regularisation and feature selection, model assessment and advanced concepts (e.g. neural networks and support vector machines).	1 Lecture (2 CH) and 1 Exercise (2 CH	1 Written examination (90 min)	5	
Applied Statistical Data Analysis (Ma-DS-3)	Students will gain an overview of analytical and statistical tools. The module also introduces students to the programming language R and the basics of analysis with R, tying this in with several essential concepts of data science.	1 Lecture (2 CH) and 1 Exercise (2 CH)	1 Written examination (90 min) or 1 Combined assessment	5	
Data Economy (Ma-DS-4)	This module explores the following topics: the fundamentals of the data economy, structured versus unstructured data, stakeholder-specific evaluation of data, data quality management, e-business and digital business models, cloud computing, data-centric marketing intelligence, open data initiatives and knowledge co-creation.	1 Lecture (2 CH)	1 Written examination (90 min) or 1 Combined assessment	5	

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Modules of the 2nd semester in Master Management & Data Science

Module	Content	Types of taught-components (type and number of course, CH)	Module requirements	CP	Commentary
Mandatory modules					
Deep Learning (Ma-DS-5)	This module covers deep neural networks, perceptrons, multilayer perceptrons, backpropagation, autoencoders, GANs, LSTMs, deep reinforcement learning, etc.	1 Lecture (2 CH) and 1 Exercise (2 CH)	1 Written examination (90 min) or 1 Combined assessment	5	
Probabilistic Modeling (Ma-DS-6)	This module covers the following topics: graphical models and belief systems, the fundamentals of Bayesian statistics, the Markov chain Monte Carlo approach, regression models, non-linear models and classification, hierarchical models, model selection, specific application packages (e.g. JAGS, Stan) and current trends.	1 Lecture (2 CH)	1 Written examination (90 min) or 1 Combined assessment	5	
Analyzing Networks (Ma-DS-7)	Students will learn the fundamentals of graph theory and network analysis and explore the following topics in more depth: networking dimensions, random graph models, community detection, hypothesis testing in the context of network data and tools for network analysis (e.g. Pajek, UCInet and Rsiena).	1 Lecture (2 CH)	1 Written examination (90 min) or 1 Combined assessment	5	
Forecasting and Simulation (Ma-DS-8)	The module explores the theory and application of statistical methods and/or methods of machine learning for predicting and simulating data with temporal dependencies.	1 Lecture (2 CH) and 1 Exercise (2 CH)	1 Written examination (90 min) or 1 Combined assessment	5	

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Modules of the 3rd semester in Master Management & Data Science

Module	Content	Types of taught-components (type and number of course, CH)	Module requirements	CP	Commentary
Mandatory module					
Data Privacy and Ethics (Ma-DS-9)	The module covers the challenges and limits of data as a public good, regulatory approaches to data protection in the context of big data, constructive data protection mechanisms and a possible framework for the institutional control of data protection.	1 Lecture (2 CH)	1 Written examination (90 min) or 1 Combined assessment	5	
Research Project (Ma-DS-10)	With assistance from staff, students will investigate a research question or question from practice.	1 seminar (2 CH)	1 Combined assessment	5	
Elective module					
Data Science Seminar (Ma-DS-11a)	Seminar on the latest methods / applications from the field of data science.	1 seminar (2 CH)	1 Combined assessment	5	
Special Topics in Data Science (Ma-DS-11b)	*This module covers the use of Data Science methods in a selected application context (e.g. Geo Information, Semantic Web, Social Media Platforms, Recommender Systems, Search Engine Marketing).*	1 Lecture (2 CH)	1 Combined assessment	5	

Modules of the 4th semester in Master Management & Data Science

Module	Content	Types of taught-components (type and number of course, CH)	Module requirements	CP	Commentary
Mandatory modules					
Masters Forum (Ma-DS-12)	Students will report on the progress of their Masters dissertation and present it for discussion.	1 Colloquium (1CH)	1 Written paper (passed/ not passed)	5	
Masters dissertation (Ma-DS-13)	Masters dissertation: a dissertation is completed by each student, working on his or her own.	none	1 Masters Dissertation and 1 Oral examination	25	

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Section II

Entry into force

This subject-specific annex will enter into force after its approval by the Presidential Board of Leuphana University Lüneburg following its publication in the official bulletin of Leuphana University Lüneburg for the winter semester 2022/23.