

This is an informal illustration: legally binding is exclusively the [Studien- und Prüfungsordnung](#)

Detailed information on each module is available from the module catalog; see also the corresponding course description on Moodle.

Every student has to choose (exactly) one track. There is no prior enrollment into a certain track needed. The track is finally determined by choosing the corresponding seminar. In particular, it is possible in the first semester to attend lectures from different tracks to get an overview.

***Further Suggestions:***

- *It is recommended to attend the mandatory courses as soon as possible. They provide the basis for many other courses.*
- *For the courses called “Selected Topics of...” several modules can be recognized.*
- *Please be aware that some courses build on other courses. The information is conveyed through the corresponding Moodle course pages and the module catalog. Please make sure that you fulfill the course requirements before beginning the course.*
- *The modules Consulting and Seminar are recommended for the third semester. They are recommended to be attended before beginning the Master’s Thesis.*

# Machine Learning

## Winter Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Supervised Learning (6) Optimization (6) <i>Choice Modules</i>	<b>12 ECTS from:</b> Advanced Machine Learning (6) Applied Machine Learning (6) Current Research in Machine Learning (6) Automated Machine Learning (6) Selected Topics of Machine Learning (3)  <b>Rest is free choice</b>
2	Statistical Inference (9) Deep Learning (6) <i>Choice Modules</i>	
3	Seminar: Machine Learning (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	

## Summer Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Statistical Inference (9) Deep Learning (6) <i>Choice Modules</i>	<b>12 ECTS from:</b> Advanced Machine Learning (6) Applied Machine Learning (6) Current Research in Machine Learning (6) Automated Machine Learning (6) Selected Topics of Machine Learning (3)  <b>Rest is free choice</b>
2	Supervised Learning (6) Optimization (6) <i>Choice Modules</i>	
3	Seminar: Machine Learning (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	

## Methodology and Modeling

Starting in the Winter Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Supervised Learning (6) <i>Choice Modules</i>	<b>Two from:</b> Survival Analysis (6) Regression for Correlated Data (6) Decision Theory (6)  <b>Additionally at least 12 ECTS from:</b> Survival Analysis (6) Regression for Correlated Data (6) Decision Theory (6) Methodological Discourses in Statistics and Data Science (6) Design of Experiments (6) Advanced Mathematical Concepts for Statistics and Data Science (6) Stochastic Processes (6) Measurement and Modelling in Social Sciences (6) Advanced Statistical Modelling (6) Spatial Statistics (6) Selected Topics of Methodology and Modelling (3) <b>Rest is free choice</b>
2	Statistical Inference (9) <i>Choice Modules</i>	
3	Seminar: Methodology and Modelling (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	

Starting in the Summer Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Statistical Inference (9) <i>Choice Modules</i>	<b>Two from:</b> Survival Analysis (6) Regression for Correlated Data (6) Decision Theory (6)  <b>Additionally at least 12 ECTS from:</b> Survival Analysis (6) Regression for Correlated Data (6) Decision Theory (6) Methodological Discourses in Statistics and Data Science (6) Design of Experiments (6) Advanced Mathematical Concepts for Statistics and Data Science (6) Stochastic Processes (6) Measurement and Modelling in Social Sciences (6) Advanced Statistical Modelling (6) Spatial Statistics (6) Selected Topics of Methodology and Modelling (3) <b>Rest is free choice</b>
2	Supervised Learning (6) <i>Choice Modules</i>	
3	Seminar: Methodology and Modelling (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	

# Econometrics

## Winter Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Supervised Learning (6) Causal Inference (6) <i>Choice Modules</i>	<b>One of:</b> Machine Learning in Econometrics (6) Nonparametric Econometrics (6)  <b>Additionally at least 6 ECTS from:</b> Basic Concepts and Structures in Official Statistics (6) Survival Analysis (6) Official Statistics on Households, Enterprises, Economies and Populations (6) Time Series (6) Machine Learning in Econometrics (6) Selected Topics in Econometrics (3) Regression for Correlated Data (6) Decision Theory (6) Measurement and Modeling in Social Sciences (6) Nonparametric Econometrics (6) Current Research in Econometrics (6) Advanced Applied Econometrics (6) <b>Rest is free choice</b>
2	Statistical Inference (9) Econometric Theory (6) <i>Choice Modules</i>	
3	Seminar: Econometrics (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	

## Summer Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Statistical Inference (9) Econometric Theory (6) <i>Choice Modules</i>	<b>One of:</b> Machine Learning in Econometrics (6) Nonparametric Econometrics (6)  <b>Additionally at least 6 ECTS from:</b> Basic Concepts and Structures in Official Statistics (6) Survival Analysis (6) Official Statistics on Households, Enterprises, Economies, and Populations (6) Time Series (6) Machine Learning in Econometrics (6) Selected Topics in Econometrics (3) Regression for Correlated Data (6) Decision Theory (6) Measurement and Modeling in Social Sciences (6) Nonparametric Econometrics (6) Current Research in Econometrics (6) Advanced applied Econometrics (6) <b>Rest is free choice</b>
2	Supervised Learning (6) Causal Inference (6) <i>Choice Modules</i>	
3	Seminar: Econometrics (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	

# Social Statistics and Data Science

## Winter Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Supervised Learning (6) <i>Choice Modules</i>	<b>Two from:</b> Complex Samples and Data Structures (6) Data Collection and Questionnaire Design (6) Measurement and Modelling in Social Sciences (6)  <b>Additionally at least 12 ECTS from:</b> Complex Samples and Data Structures (6) Basic Concepts and Structures in Official Statistics (6) Causal Inference (6) Survival Analysis (6) Data Collection and Questionnaire Design (6) Official Statistics on Households, Enterprises, Economies, and Populations (6) Advanced Methods in Social Statistics and Social Data Science (6) Regression for Correlated Data (6) Decision Theory (6) Measurement and Modeling in Social Sciences (6) Computational Social Science (6) Selected Topics of Social Statistics and Social Data Science (3) <b>Rest is free choice</b>
2	Statistical Inference (9) <i>Choice Modules</i>	
3	Seminar: Social Statistics and Data Science (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	

Summer Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Statistical Inference (9) <i>Choice Modules</i>	<p><b>Two from:</b> Complex Samples and Data Structures (6) Data Collection and Questionnaire Design (6) Measurement and Modelling in Social Sciences (6)</p> <p><b>Additionally at least 12 ECTS from:</b> Complex Samples and Data Structures (6) Basic Concepts and Structures in Official Statistics (6) Causal Inference (6) Survival Analysis (6) Data Collection and Questionnaire Design (6) Official Statistics on Households, Enterprises, Economies, and Populations (6) Advanced Methods in Social Statistics and Social Data Science (6) Regression for Correlated Data (6) Decision Theory (6) Measurement and Modeling in Social Sciences (6) Computational Social Science (6) Selected Topics of Social Statistics and Social Data Science (3)</p> <p><b>Rest is free choice</b></p>
2	Supervised Learning (6) <i>Choice Modules</i>	
3	Seminar: Social Statistics and Data Science (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	

# Biostatistics

## Winter Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Supervised Learning (6) Preclinical and Clinical Studies (6) <i>Choice Modules</i>	<b>12 ECTS from:</b> Diagnostic Accuracy Studies (6) Selected Topics of Biostatistics (3) Analysis of High-dimensional Biological Data (6) Introduction to Medical Terminology (3) Statistical Methods in Epidemiology (6) Advanced Methods in Biostatistics (6) Selected Biostatistical Applications (3)  <b>Especially Recommended for Classical Biostats:</b> Survival Analysis (6) Selected Software for Applied Statistics (SAS) (3)  <b>Additionally at least 6 ECTS from:</b> Survival Analysis (6) Diagnostic Accuracy Studies (6) Selected Topics of Biostatistics (3) Analysis of High-dimensional Biological Data (6) Introduction to Medical Terminology (3) Regression for Correlated Data (6) Statistical Methods in Epidemiology (6) Advanced Methods in Biostatistics (6) Selected Biostatistical Applications (3) <b>Rest is free choice</b>
2	Statistical Inference (9) <i>Choice Modules</i>	
3	Seminar: Biostatistics (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	



Summer Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (12) Statistical Inference (9) <i>Choice Modules</i>	<b>12 ECTS from:</b> Diagnostic Accuracy Studies (6) Selected Topics of Biostatistics (3) Analysis of High-dimensional Biological Data (6) Introduction to Medical Terminology (3) Statistical Methods in Epidemiology (6) Advanced Methods in Biostatistics (6) Selected Biostatistical Applications (3)
2	Supervised Learning (6) Preclinical and Clinical Studies (6) <i>Choice Modules</i>	
3	Seminar: Biostatistics (9) Consulting (12) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	
		<b>Especially Recommended for Classical Biostats:</b> Survival Analysis (6) Selected Software for Applied Statistics (SAS) (3)
		<b>Additionally at least 6 ECTS from:</b> Survival Analysis (6) Diagnostic Accuracy Studies (6) Selected Topics of Biostatistics (3) Analysis of High-dimensional Biological Data (6) Introduction to Medical Terminology (3) Regression for Correlated Data (6) Statistical Methods in Epidemiology (6) Advanced Methods in Biostatistics (6) Selected Biostatistical Applications (3)
		<b>Rest is free choice</b>

EMOS Certification is awarded by [Eurostat](#) to any student choosing the corresponding path. This can be combined with either the Machine Learning or the Social Statistics specialization observing further restrictions. The program contains an internship at an institution producing official statistics, and the Master's Thesis has to address a topic of relevance for official statistics. The program is supported by the following cooperation partners: the Federal Statistical Office of Bavaria, the Statistics Unit of the German Labor Agency, the Institute for Employment Research and the Statistical Office of Munich.

## **EMOS with Social Statistics and Data Science**

Winter Semester

<b>Semester</b>	<b>Mandatory (ECTS)</b>	<b>Choice (ECTS)</b>
<b>1</b>	Statistical Modelling (9) Supervised Learning (6) Basic Concepts and Structures in Official Statistics (6) Complex Samples and Data Structures (6) <i>Choice Modules</i>	<b>Rest is free choice</b>
<b>2</b>	Statistical Inference (9) EMOS Colloquium (3) Official Statistics on Households, Enterprises, Economies, and Populations (6) Data Collection and Questionnaire Design (6) <i>Choice Modules</i>	
<b>3</b>	Seminar: EMOS (9) EMOS Internship (12) <i>Choice Modules</i>	
<b>4</b>	Master's Thesis + Disputation (30)	

Summer Semester

<b>Semester</b>	<b>Mandatory (ECTS)</b>	<b>Choice (ECTS)</b>
<b>1</b>	Statistical Modelling (9) Statistical Inference (9) Basic Concepts and Official Statistics on Households, Enterprises, Economies, and Populations (6)	<b>Rest is free choice</b>
<b>2</b>	Supervised Learning (6) Basic Concepts and Structures in Official Statistics (6) Complex Samples and Data Structures (6) <i>Choice Modules</i>	
<b>3</b>	Seminar: EMOS (9) EMOS Internship (12) EMOS Colloquium (3) <i>Choice Modules</i>	
<b>4</b>	Master's Thesis + Disputation (30)	

## Machine Learning with EMOS

### Winter Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (9) Supervised Learning (6) Optimization (6) Basic Concepts and Structures in Official Statistics (6) <i>Choice Modules</i>	<b>6 ECTS from:</b> Advanced Machine Learning (6) Applied Machine Learning (6) Current Research in Machine Learning (6) Automated Machine Learning (6) Selected Topics of Machine Learning (3)
2	Statistical Inference (9) Deep Learning (6) Official Statistics on Households, Enterprises, Economies, and Populations (6) Data Collection and Questionnaire Design (6) EMOS Colloquium (3)	
3	Seminar: Machine Learning in Official Statistics (9) EMOS Internship (12) Computational Social Science (6) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	

Summer Semester

Semester	Mandatory (ECTS)	Choice (ECTS)
1	Statistical Modelling (9) Statistical Inference (9) Deep Learning (6) Basic Concepts and Official Statistics on Households, Enterprises, Economies, and Populations (6)	<b>6 ECTS from:</b> Advanced Machine Learning (6) Applied Machine Learning (6) Current Research in Machine Learning (6) Automated Machine Learning (6) Selected Topics of Machine Learning (3)
2	Supervised Learning (6) Optimization (6) Basic Concepts and Structures in Official Statistics (6) Data Collection and Questionnaire Design (6) <i>Choice Modules</i>	
3	Seminar: EMOS (9) EMOS Internship (12) EMOS Colloquium (3) <i>Choice Modules</i>	
4	Master's Thesis + Disputation (30)	