

# MASTER PROGRAM STATISTICS

**Information for incoming students**



IFAS - Institute for Applied Statistics

# Master Program Statistics at JKU

- Degree: Master of Science (MSc)
- Duration: 4 semesters
- Qualification profile: a graduate
  - can manage, visualize and analyse data
  - can develop and apply statistical methods
  - is able to collaborate with experts from other fields
  - is well prepared to do a Phd in Statistics

# Structure

<b>Subjects</b>	<b>ECTS</b>
Mandatory Subjects	63
Elective Subjects	18
Master's Thesis (incl. Master's Seminars)	24
Master's Examination	3
Free Electives	12
<b>Total</b>	<b>120</b>

## Forms

- general
- with study focus
  - Data Science
  - Official Statistics

# Subjects

- Mathematical Statistics (24 ECTS)
- Statistical Methods (24 ECTS)
- Data Analysis (12 ECTS)
- Soft Skills (3 ECTS)
- Elective Subjects (18 ECTS)

	Stat. Methods in Data Science	Data Engineering	Applied Statistics	Sum
general	0/6	0/6	12	18
Data Science	6	12	-	18
Official Statistics	-	-	18	18

- Master Thesis + Seminars

# Master Statistics: Study focus

Both foci

- Completion of the corresponding courses
- topic of the master thesis in the field of data science/official statistics

Official Statistics

- recommended: internship at an institution of official statistics (e.g. Statistics Austria)
- with this internship all requirements for EMOS certificate (European Master of Official Statistics) are fulfilled

# Master Statistics: Soft Skills

you may choose among courses in

- gender studies
- ethics
- intercultural competences
- English

# Study Plan

## Global map of study subjects- Master's Program Statistics

1 <sup>st</sup> Semester (WS)		2 <sup>nd</sup> Semester (SS)		3 <sup>rd</sup> Semester (WS)		4 <sup>th</sup> Semester (SS)	
Subject/Course	ECTS	Subject/Course	ECTS	Subject/Course	ECTS	Subject/Course	ECTS
Mathematical Statistics Probability Theory (VL)	4	Mathematical Statistics Advanced Statistical Inference (VL)	4	Statistical Concepts Computational Statistics (KV)	4	Elective Subjects	6
Mathematical Statistics Probability Theory (UE)	6	Mathematical Statistics Advanced Statistical Inference (UE)	6	Statistical Modelling Survival Analysis (KV)	4	Master Thesis Seminars Master's Seminar (SE)	2
Mathematical Statistics Stochastic Processes	4	Statistical Concepts Experimental Design (KV)	4	Data analytics Biostatistics (KV)	4	Master's Thesis	20
Statistical Modelling Advanced Regression Analysis (KV)	4	Statistical Modelling Statistical Learning (KV)	4	Elective Subjects	6	Master's exam	3
Elective Subjects	6	Statistical Concepts Bayes Statistics (KV)	4	Master Thesis Seminars Master's Seminar (SE)	2		
		Data analytics Methods for Statistical Projects (SE) *	4				
Soft Skills	3	Data analytics Statistical Projects (SE)*	4				
free electives	3	free electives	0	free electives	9		
$\Sigma$	30	$\Sigma$	30	$\Sigma$	29	$\Sigma$	31
<b>Total</b>							<b>120</b>

\* joint with Bachelor Statistics

# Course types

- **VL** (lecture): teacher presentation, usually exam
- **UE** (exercises): accompanies a lecture; usually examples have to be prepared for the next week
- **KV** (combined course): combination of VL and UE
- **SE** (seminar): students are supposed to independently acquire knowledge and give a presentation
- **PR** (practical): elements of hands on training (e.g. on computer/laptop)



## Required knowledge

- all courses in the master program Statistics require knowledge in the following fields
  - English
  - mathematics (linear algebra, analysis)
  - elementary probability theory and introductory statistical inference
  - basic knowledge of R

Use the time until start of the term to prepare!

- additional knowledge is required in some courses
- courses of the second year of the program are not recommended for new students
  - Winter Term: Computational Statistics; Survival Analysis; Biostatistics; SE Applied Statistics
  - Summer Term: SE Statistical Application
- **no admission** to the Master's Seminars in year 1 of the Master Statistics

# Courses in the first year

Course	Sem.	Additionally Required knowledge
Probability Theory	7	basic probability theory
Stochastic Processes	7	time series analysis (basic)
Advanced Regression Analysis	7	linear and generalized linear models (basic), R
Statistical Principles of Data Science	7	R
Advanced Statistical Inference	8	statistical inference
Experimental Design	8	—
Statistical Learning	8	linear and generalized linear models , R
Bayes Statistic	8	probability theory; R
Statistical Projects	8	R; ev. further requirements
Methods in Statistical Projects	8	R; ev. further requirements

## Recommended Literature

- **Probability Theory:** Casella, G. and Berger, J. (2002). Statistical Inference, Chapters 1 - 3.3
- **Statistical Inference:** Casella, G. and Berger, J. (2002). Statistical Inference, Chapters 5.1 - 5.4, 6 - 9
- **Linear and Generalized Linear Models:** Fahrmeir et. al. (2013). Regression: models, methods and application
- **R**
  - Dalgaard, P. (2008). Introductory statistics with R.
  - Braun, W. J. and Murdoch, D. J. (2007). A First Course in Statistical Programming with R
- **Time Series Analysis:** Cowpertwait, Paul S. P. and Metcalfe, Andrew V. (2009) Introductory time series with R.

Books are available at the library of the Statistic's department.

# Further Information

- **general information**

<https://www.jku.at/en/studying/studies-from-a-z>

- **master program in Statistics at JKU**

<https://www.jku.at/en/degree-programs/degree-programs/masters-degree-programs/ma-statistics/>

- **information on the master program in Statistics at the department**

<https://www.jku.at/en/institute-of-applied-statistics/studying-statistics/programs/masters-degree-in-statistics/>

- **information on courses: KUSSS**

<https://www.kusss.jku.at/kusss/index.action>

- **student representatives**

<https://www.oeh.jku.at/abschnitte/statistik>

# Contact

- **admission:** admission office

<https://www.jku.at/en/teaching-and-studies-organization/admissions-office>

- **recognition of completed courses:** recognition office

<https://www.jku.at/en/teaching-and-studies-organization/examination-and-recognitions-services/>

- **admission and recognition to the master program in Statistics**

responsible: Helmut Waldl, email: [helmut.waldl@jku.at](mailto:helmut.waldl@jku.at)

- **comittee of study affairs Statistics**

head: Helga Wagner, email: [helga.wagner@jku.at](mailto:helga.wagner@jku.at)

- **student representatives**

email: [stat@oeh.jku.at](mailto:stat@oeh.jku.at)