

The data science Master degree

Data & Knowledge Engineering (MDKE)



INF

FACULTY OF
COMPUTER SCIENCE

Myra Spiliopoulou (Studies Coordinator)



Knowledge
Management &
Discovery Lab



Research focus:

- ▶ Learning methods for streams and time series with gaps
- ▶ Cost-aware feature acquisition

Application areas:

- Treatment outcome prediction
- Phenotyping
- Prediction in mHealth apps

Teaching:

- Data mining
- Recommenders
- Business informatics
- Seminars and projects in subdomains of data science

1. MDKE for data science

2. Planing your MDKE studies

More on:

When to choose modules?

4. Getting Advice

1. MDKE for data science

What do you need to do Data Science?

1. Data
2. Methods
 - to process data – efficiently
 - to learn from data
 - to describe complex objects
 - to present complex objects and what we know on them
3. Business understanding
4. Understand how to match Data with Methods

What do you need to do Data Science?

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- ▶ a social network
- ▶ a medical record
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- ▶ a disease
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- ▶ a pizza

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Thematic areas:

Starting: Fundamentals of Data Science [12-18 ECTS]

1. Learning Methods and Models of Data Science [18-36 ECTS]

2. Data Processing for Data Science [18-30 ECTS]

3. Applied Data Science [18-24 ECTS]

and finally: the Master thesis [30 ECTS]

Where to find more information?

Module catalogue of the degree, also known as “Module Hand Book” (MHB)

- ▶ This is a large PDF document:
 - ★ It contains the description of each module we offer in the FIN.
 - ★ It contains one section per thematic area of the degree, with all the modules that fit to this area.
 - ★ In it, you may find a module more than once! Some modules fit to more than one thematic area.
- ▶ You find it under
<https://www.inf.ovgu.de/en/Study/Being+a+student/Examination+Office/Study+Regulations.html>
Entry ‘Data & Knowledge Engineering’ (in the middle of the page, left side)
- ▶ It is updated once per semester ⇒ Choose the most recent one.

and in the LSF

2. Planing your MDKE studies

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 - 1.1 Lecture (called "Vorlesung") with Exercises (called "Übung")
 - 1.2 Seminar
 - 1.3 Scientific Teamproject or Teamproject for short, intended for teams;
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 - 1.4 Individualproject, intended for one student only

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4. Consult your mind and your heart: write down what you are interested in, listen to your curiosity, go with your strengths
5. Plan for three semesters, but be ready to re-plan later!

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- ▶ DO NOT ask the teacher to shift your assignment of his/her module to a thematic area that suits you better !!

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the course is also assigned to a thematic area.

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Where to find more information?

Landing page: <https://www.inf.ovgu.de/inf/en/Study/Being+a+student/Incoming.html>

and from there you follow the links to:

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Interviews with teachers on their courses under

www.inf.ovgu.de/inf/en/Study/Being+a+student/Incoming/Courses+Introduction-p-5078.html

From that page you reach interview videos, in which teachers elaborate on their courses: what the course is about, what expectations they have from the students, what can the students do after completing the course successfully

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Mentors!

There is an international team of mentors to help you in the start of your studies. Infos on how to reach them from the URLs above.

More on:

When to choose modules?

When to choose which modules?

Area	1st & 2nd semester	2nd & 3rd semester
<i>Fundamentals of Data Science</i>	PPSW [A] Data Mining I, Machine Learning [L] Introduction to Simulation [S] Wissenschaftliches Rechnen IV & V [L]	Fuzzy Systems [S], (L) Advanced Topics in Geometric Mechanics [L+]
<i>Learning Methods & Models for Data Science</i>	(S) Applied Discrete Modelling, Intelligent Data Analysis, Recommenders, Einführung in die angewandte Ontologie, (L/S) Neuronale Netze, Bayes Networks (L) Introduction to Deep Learning [DL], ...	Data Mining II, (A) Advanced topics in ML , Swarm Intelligence, Evolutionary Multiobjective Optimization [CI], (A) Seminar 'Predictive Maintenance', [DL] Learning Generative Models, ...
<i>Data Processing for Data Science</i>	Advanced Database Models [D], (D) Data Warehouse Technologies, Advanced Topics in Databases, Information Retrieval, Multimedia Retrieval Datenbanken Implementierungstechniken, Geometrische Datenstrukturen, Grundlagen semantischer Technologien, Distributed Data Management, Transaction Processing, Big Data – Storage and Processing, In-Memory and Cloud Technologien I, II & III VLBA – Cloud DevOps Technologies, Parallel Storage Systems, ...	
<i>Applied Data Science</i>	XXXXXXXXXXXXXXXX	
Teamproject	XXXXXXXXXXXXXXXX	

Mark after the title	Mark before the title	How to read it
Introduction to Deep Learning [DL]	[DL] Learning Generative Models	'DL' is a competency. The module with the mark '[...]' after the title delivers this competency; the module with the mark at the right demands this competency. Hence: pass the module that gives the competency before you attempt the module that demands this competency.
Advanced Database Models [D]	(D) Data Warehouse Technologies	The mark '(...)' denotes a 'better-have' competency. Hence: better attend the module at the left before you attempt the module at the right.

Special cases

PPSW [A]	(A) Advanced topics {of KMD, of ML, ...}, Seminar 'Predictive Maintenance', Seminar '...'	The modules in the middle column are on advanced topics; most of them are seminars. PPSW delivers skills that you need to pass a seminar. If you never attended a seminar, you need PPSW.
Scientific computing [L+]		Delivers mathematical underpinnings that are valuable for many other courses.

On the naming of the modules

Machine Learning	Advanced Topics of Machine Learning	The module at the right expects skills that you learn in the module at the left.
Data Mining I	Data Mining II	The module at the right expects some skills. Best choice is the module at the left.

So, how to choose modules in the 1st semester?

One possible way:

1. Plan the 'Fundamentals of Data Science' over the first two semesters.
2. Select from 'Learning ...': There are entry-barriers, so plan over all three semesters.
3. Select from 'Data Engineering ...': The modules of this area are heavily visited but have less entry-barriers, so plan for semesters 1 and 2 first.

Another possible way:

1. Plan the 'Fundamentals of Data Science' over the first two semesters.
2. Go to 'Applied Data Science' and check what topics you want to attend in semesters 2 and 3. Check the titles and descriptions of the modules.
3. Go to 'Learning ...' and pick the modules that deliver the skills you need for your Applied Data science choice.
3. Go to 'Data Engineering ...' and do alike.

4. Getting Advice

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- ▶ Exam issues: Examinations Office
- ▶ Complex plans of studies, general troubleshooting: Studies coordinator (me)
`myra@iti.cs.uni-magdeburg.de`
- ▶ General issues on international studies: Coordinator of International Studies

Thank you for your attention!

Much success with your studies with us!