

Master's Degree Programme Computer Science

Revised 8 May 2020



AARHUS
UNIVERSITY

Structure of Master's Degree Programme

1 st Semester	Specialization 1 (30 ECTS)	Specialization 2 (30 ECTS)	Elective (30 ECTS)
2 nd Semester			
3 rd Semester			
4 th Semester	Thesis (30 ECTS)		

- Specialization:
 - Two 30 ECTS specializations
- Elective:
 - Recommendation is a 3rd specialization.
 - A small number of elective courses in computer science is offered in addition to specializations. Project work (partly) is also a possibility.
 - Elective courses may be supportive rather than core computer science, e.g. extra mathematics courses.
 - There may be requirements for the composition of the study program in connection with possible admission. In this case mandatory courses replace the elective courses (partly).
- Thesis: Written within the area of specialization 1 or 2

Current specializations

- Specializations are taught by active researchers in the corresponding field
- Current offerings
 - Algorithmics (30 ECTS)
 - Cryptology (30 ECTS)
 - Data-Intensive Systems (30 ECTS)
 - Human-computer Interaction (30 ECTS)
 - Programming Languages (30 ECTS)
 - Ubiquitous Computing and Interaction (30 ECTS)
 - Bioinformatics (30 ECTS)
 - For more than a single specialization in bioinformatics apply for the special Master's Degree Programme in Bioinformatics

Algorithmics

1 st Sem (Fall)	<u>Computational Geometry: Theory and Experimentation (10 ECTS)</u>	LA + PA
2 nd Sem (Spring)	<u>Randomized Algorithms (10 ECTS)</u>	KGL
3 rd Sem (Fall)	<u>Theory of Algorithms and Computational Complexity (10 ECTS)</u>	KAH

- Semesters are independent – can be taken in any order
- Third semester may be replaced with Advanced Data Management and Analysis (10 ECTS) from the Data-Intensive Systems group

Algorithms and Data Structures

- Lars Arge
- Gerth Stølting Brodal
- Peyman Afshani
- Kasper Green Larsen
- Kristoffer Arnsfelt Hansen



Cryptology

1 st Sem (Fall)	<u>Cryptology (10 ECTS)</u>	IBD
2 nd Sem (Spring)	<u>Cryptologic Protocol Theory (10 ECTS)</u>	IBD + JBN
3 rd Sem (Fall)	<u>Cryptographic Computing (10 ECTS)</u>	CO

- Semesters have progression
 - First semester is prerequisite for the other semesters
 - Last two semesters can be taken in any order



Cryptography and Security

- Ivan Bjerre Damgård
- Jesper Buus Nielsen
- Claudio Orlandi
- Peter Scholl



Data-Intensive Systems

1 st Sem (Fall)	<u>Advanced Data Management and Analysis (10 ECTS)</u>	IA+PK+DM
2 nd Sem (Spring)	<u>Data Mining (10 ECTS) *</u>	IA+PK+DM
3 rd Sem (Fall)	<u>Data Visualization (10 ECTS) OR</u> <u>Deep Learning for Visual Recognition (10 ECTS)</u>	

- Semesters are independent – can be taken in any order
- (*) Machine Learning is a prerequisite for Data Mining
- Data Visualization and Deep Learning for Visual Recognition are taught by and shared with the Ubiquitous Computing and Interaction group

Data-intensive Systems

- Ira Assent
- Panagiotis Karras
- Davide Mottin



Human-Computer Interaction

1 st Sem (Fall)	<u>Interactivity and Computer Mediation – Concepts, Theories, Methods, Cases (10 ECTS)</u>	SB
2 nd Sem (Spring)	<u>Designing Interactive Technologies (10 ECTS)</u>	SB
3 rd Sem (Fall)	<u>Multimodal Interaction (10 ECTS)</u>	EH

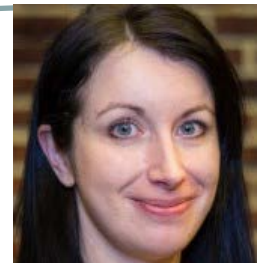
- Semesters are independent – can be taken in any order

Computer Mediated Activity

- Susanne Bødker
- Olav Bertelsen
- Eve Hoggan

Use, Design and Innovation

- Morten Kyng



Programming Languages

1 st Sem (Fall)	<u>Program Analysis and Verification (10 ECTS)</u>	AM + LB
2 nd Sem (Spring)	<u>Language-based Security (10 ECTS)</u>	AA
3 rd Sem (Fall)	<u>Functional Programming (10 ECTS)</u>	BS

- Semesters are independent – can be taken in any order

Programming Languages

- Anders Møller
- Magnus Madsen
- Andreas Pavlogiannis



Logic and Semantics

- Lars Birkedal
- Aslan Askarov
- Bas Spitters
- Jaco van de Pol
- Amin Timany



Ubiquitous Computing and Interaction

1 st sem (Fall)	<u>Building the Internet of Things with P2P and Cloud Computing (10 ECTS)</u>	NOB
2 nd Sem (Spring)	<u>Augmented Reality (5 ECTS)</u>	KG
	<u>Advanced Augmented Reality Project (5 ECTS)</u>	KG
3 rd Sem (Fall)	<u>Data Visualization (10 ECTS)</u> OR <u>Deep Learning for Visual Recognition (10 ECTS)</u>	H-JS

- Semesters are independent – can be taken in any order

Ubiquitous Computing and Interaction

- Kaj Grønbaek
- Niels Olof Bouvin
- Marianne Graves Petersen
- Hans Gellersen
- Jo Vermeulen
- Hans-Jörg Schultz



Specializations from Master's degree Programme in **Bioinformatics**

(offered by Bioinformatics Research Centre)

Contact: Christian Storm Pedersen —



Thomas Mailund —



Algorithms and Programming

	Recommended order of courses	Alternative order of courses
1 st Sem (Fall)	<u>Genome-Scale Algorithms (10 ECTS)</u>	<u>Tree of Life (10 ECTS)</u>
2 nd Sem (Spring)	<u>Algorithms in Bioinformatics (10 ECTS)</u>	<u>Algorithms in Bioinformatics (10 ECTS)</u>
3 rd Sem (Fall)	<u>Tree of Life (10 ECTS)</u> OR <u>Projects in Bioinformatics (10 ECTS)</u>	<u>Genome-Scale Algorithms (10 ECTS)</u>

Statistics and Data

1 st Sem (Fall)	<u>Data Science in Bioinformatics (10 ECTS)</u>
2 nd Sem (Spring)	<u>Statistical and Machine Learning in Bioinformatics (10 ECTS)</u>
3 rd Sem (Fall)	<u>Tree of Life (10 ECTS)</u> OR <u>Genome-Scale Algorithms (10 ECTS)</u> OR <u>Projects in Bioinformatics (10 ECTS)</u>

For more info about the Master's program in bioinformatics, see <http://www.birc.au.dk/Studies>

Elective Courses (CS)

Elective courses (apart from specialisations)

- Fall

- Interdisciplinary Digital Entrepreneurship (10 ECTS)
- Machine Learning (10 ECTS) (bachelor course)

- Fall & Spring:

- Project work in Computer Science (5 or 10 ECTS)
- Vocational Training Project (10 ECTS)

Guidance/Questions

- Guidance for your personal study program?
- Questions about rules for composition of the study program?
- Please contact
 - Gudmund Skovbjerg Frandsen
 - gudmund@cs.au.dk