MASTER’S DEGREE PROGRAM
COMPUTER SCIENCE
1. Structure of the Master’s Degree Program
   I. Box diagram
   II. Specializations
   III. Elective courses
   IV. Requirements for the study program

2. Study abroad

3. Admission

4. External Collaboration

5. Practical information

Link to current slides: www.cs.au.dk/study
STRUCTURE OF MASTER’S DEGREE PROGRAM

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
REQUIREMENTS FOR THE STUDY PROGRAM

120 ECTS in total
- At least 90 ECTS graduate level computer science
- At least 180 ECTS computer science in bachelor’s + master’s

Mandatory courses
- Mandatory courses are determined at admission (usually courses missing in bachelor program)

Specializations
- At least 2 specializations of 30 ECTS each
- A single specialization suffices when the program includes study abroad
- Up to 10 ECTS of the 30 ECTS may be replaced by a course from another specialization or a project work

Thesis (30 ECTS)
All Programs (Bachelor or Master’s) must include 60 ECTS passed at Natural Science, Aarhus University (This has implications for credit transfer!)
SPECIALIZATIONS
CURRENT SPECIALIZATIONS

Specializations are taught by active researchers in the corresponding field

Current offerings

• Advanced Machine Learning and Data Science (30 ECTS)
• Algorithmics (30 ECTS)
• Cryptology (30 ECTS)
• Data-Intensive Systems (30 ECTS)
• Human-computer Interaction (30 ECTS)
• Logic, Semantics and Verification (30 ECTS)
• Programming Languages and Software Security (30 ECTS)
• Ubiquitous Computing and Interaction (30 ECTS)
• Bioinformatics (30 ECTS)
ADVANCED MACHINE LEARNING AND DATA SCIENCE

<table>
<thead>
<tr>
<th>1st Sem (Fall)</th>
<th>Deep Learning for Visual Recognition (10 ECTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Sem (Spring)</td>
<td>Cluster Analysis (10 ECTS)</td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Algorithms, Incentives, and Data (10 ECTS)</td>
</tr>
</tbody>
</table>

- Semesters are independent – can be taken in any order
- Machine Learning is a prerequisite for this specialization

**Algorithms, Data Structures and Foundations of Machine Learning**
- Chris Schwiegelshohn
- Gerth Stølting Brodal
- Kasper Green Larsen
- Peyman Afshani

**Computational Complexity and Game Theory**
- Ioannis Caragiannis
- Kristoffer Arnsfelt Hansen
- Srikanth Srinivasan
ALGORITHMICs

1st Sem (Fall)  Computational Geometry: Theory and Experimentation (10 ECTS)  PA
2nd Sem (Spring)  Randomized Algorithms (10 ECTS)  KGL + IC
3rd Sem (Fall)  Theory of Algorithms and Computational Complexity (10 ECTS)  KAH
                OR Quantum Information Processing (10 ECTS)  IBD + SS

- 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, Data Structures and Foundations of Machine Learning
- Chris Schwiegelshohn
- Gerth Stølting Brodal
- Kasper Green Larsen
- Peyman Afshani

Computational Complexity and Game Theory
- Ioannis Caragiannis
- Kristoffer Arnsfelt Hansen
- Srikanth Srinivasan
CRYPTOLOGY

<table>
<thead>
<tr>
<th>1st Sem (Fall)</th>
<th>Cryptology (10 ECTS)</th>
<th>IBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Sem (Spring)</td>
<td>Cryptologic Protocol Theory (10 ECTS) OR Systems Security (10 ECTS)</td>
<td>SY + IBD DFA</td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Cryptographic Computing (10 ECTS) OR Quantum Information Processing (10 ECTS)</td>
<td>CO + PS IBD + SS</td>
</tr>
</tbody>
</table>

- Cryptology is prerequisite for Cryptologic Protocol Theory and Cryptographic Computing
- Systems Security is independent of the other courses

Cryptography and Security
- Claudio Orlandi
- Diego F. Aranha
- Ivan Bjerre Damgård
- Jesper Buus Nielsen
- Peter Scholl
- Sophia Yakoubov
DATA-INTENSIVE SYSTEMS

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Description</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Sem (Fall)</td>
<td>Data Visualization (10 ECTS) or Deep Learning for Visual Recognition (10 ECTS)</td>
<td>10 ECTS</td>
<td></td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Data Mining (10 ECTS)</td>
<td>10 ECTS</td>
<td>(*) Machine Learning is a prerequisite for Data Mining</td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Advanced Data Management and Analysis (10 ECTS)</td>
<td>10 ECTS</td>
<td>PK</td>
</tr>
</tbody>
</table>

- 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
- Cigdem Aslay
- Davide Mottin
- Ira Assent
- Panagiotis Karras

AARHUS UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE

COMPUTER SCIENCE MASTER'S
26 SEPTEMBER 2023
# HUMAN-COMPUTER INTERACTION

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
<th>Tutors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Sem (Fall)</td>
<td>Interactivity and Computer Mediation – Concepts, Theories, Methods, Cases (10 ECTS)</td>
<td></td>
<td>OB</td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Designing Interactive Technologies (10 ECTS)</td>
<td></td>
<td>NE</td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Multimodal Interaction (10 ECTS) (not in 2023)</td>
<td></td>
<td>EH, MW</td>
</tr>
<tr>
<td></td>
<td>Engineering Interactive Technologies (10 ECTS)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Semesters are independent – can be taken in any order

## Collaboration and Computer-Human Interaction
- Clemens Nylandsted Klokmose
- Eve Hoggan
- Henrik Korsgaard
- Michael Wessely
- Olav Bertelsen
- Susanne Bødker

## Ubiquitous Computing and Interaction
- Hans-Jörg Schultz
- Niklas Elmqvist
- Kaj Grønbæk
- Ken Pfeuffer
- Marianne Graves Petersen
- Niels Olof Bouvin
PROGRAMMING LANGUAGES AND SOFTWARE SECURITY

<table>
<thead>
<tr>
<th>Semesters</th>
<th>Courses</th>
<th>Credits</th>
<th>Tutors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Sem (Fall)</td>
<td>Program Analysis (10 ECTS)</td>
<td>AM + MM</td>
<td>Amin Timany, Aslan Askarov, Bas Spitters, Jaco van de Pol, Jean Yves Alexis Pichon, Lars Birkedal</td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Language-based Security (10 ECTS)</td>
<td>AA</td>
<td></td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Advanced Topics in Programming Language Theory (10 ECTS)</td>
<td>BS</td>
<td></td>
</tr>
</tbody>
</table>

- Semesters are independent – can be taken in any order

Logic and Semantics
- Amin Timany
- Aslan Askarov
- Bas Spitters
- Jaco van de Pol
- Jean Yves Alexis Pichon
- Lars Birkedal

Programming Languages
- Anders Møller
- Andreas Pavlogiannis
- Magnus Madsen
## LOGIC, SEMANTICS AND VERIFICATION

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
<th>Instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Sem (Fall)</td>
<td>Formal Software Verification (10 ECTS)</td>
<td>BS</td>
<td>Amin Timany, Aslan Askarov, Bas Spitters</td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Algorithmic Model Checking (10 ECTS)</td>
<td>JvdP + AP</td>
<td>Jaco van de Pol, Jean Yves Alexis Pichon, Lars Birkedal</td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Program Logics (10 ECTS)</td>
<td>AT + LB</td>
<td>Anders Møller, Andreas Pavlogiannis, Magnus Madsen</td>
</tr>
</tbody>
</table>

- Semesters are independent – can be taken in any order

### Logic and Semantics
- Amin Timany
- Aslan Askarov
- Bas Spitters
- Jaco van de Pol
- Jean Yves Alexis Pichon
- Lars Birkedal

### Programming Languages
- Anders Møller
- Andreas Pavlogiannis
- Magnus Madsen
# UBIQUITOUS COMPUTING AND INTERACTION

<table>
<thead>
<tr>
<th></th>
<th>1st sem (Fall)</th>
<th>NOB</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Building the Internet of Things with P2P and Cloud Computing (10 ECTS)</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>2nd Sem (Spring)</th>
<th>KP</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Augmented Reality (5 ECTS)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Advanced Augmented Reality Project (5 ECTS)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>3rd Sem (Fall)</th>
<th>H-JS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data Visualization (10 ECTS) OR Deep Learning for Visual Recognition (10 ECTS)</td>
<td></td>
</tr>
</tbody>
</table>

- Semesters are independent – can be taken in any order

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**Collaboration and Computer-Human Interaction**
- Clemens Nylandsted Klokmose
- Eve Hoggan
- Henrik Korsgaard
- Michael Wessely
- Olav Bertelsen
- Susanne Bødker

**Ubiquitous Computing and Interaction**
- Hans-Jörg Schultz
- Niklas Elmqvist
- Kaj Grønbæk
- Ken Pfeuffer
- Marianne Graves Petersen
- Niels Olof Bouvin
### SPECIALIZATIONS FROM MASTER’S DEGREE PROGRAM IN BIOINFORMATICS (OFFERED BY BIOINFORMATICS RESEARCH CENTRE)

#### Algorithms and Programming

<table>
<thead>
<tr>
<th>Semester</th>
<th>Recommended order of courses</th>
<th>Alternative order of courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Sem (Fall)</td>
<td><strong>Genome-Scale Algorithms (10 ECTS)</strong> (not in 2023)</td>
<td><strong>Evolutionary Thinking (10 ECTS)</strong></td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td><strong>Algorithms in Bioinformatics (10 ECTS)</strong></td>
<td><strong>Algorithms in Bioinformatics (10 ECTS)</strong></td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td><strong>Evolutionary Thinking (10 ECTS)</strong> OR <strong>Projects in Bioinformatics (10 ECTS)</strong></td>
<td><strong>Genome-Scale Algorithms (10 ECTS)</strong> (not in 2023)</td>
</tr>
</tbody>
</table>

#### Statistics and Data

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Sem (Fall)</td>
<td><strong>Data Science in Bioinformatics (10 ECTS)</strong></td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td><strong>Statistical and Machine Learning in Bioinformatics (10 ECTS)</strong></td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td><strong>Evolutionary Thinking (10 ECTS)</strong> OR <strong>Genome-Scale Algorithms (10 ECTS)</strong> (not in 2023) OR <strong>Projects in Bioinformatics (10 ECTS)</strong></td>
</tr>
</tbody>
</table>

For more info about the Master’s program in bioinformatics, see [http://www.birc.au.dk/Studies](http://www.birc.au.dk/Studies)

Contact: Christian Storm Pedersen cstorm@birc.au.dk
If you don’t have the prerequisite courses or similar background in your bachelor, you can take a bachelor course as part of your MSc program.

<table>
<thead>
<tr>
<th>Specialization</th>
<th>Prerequisite (bachelor course)</th>
<th>Recommended / required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Machine Learning and Data Science</td>
<td>Machine Learning</td>
<td>required</td>
</tr>
<tr>
<td>Algorithms and Data Structures</td>
<td>Optimization</td>
<td>recommended</td>
</tr>
<tr>
<td>Cryptology</td>
<td>Distributed Systems and Security</td>
<td>recommended</td>
</tr>
<tr>
<td>Data-Intensive Systems</td>
<td>Machine Learning</td>
<td>recommended</td>
</tr>
<tr>
<td>Human-Computer Interaction</td>
<td>Human-Computer Interaction</td>
<td>required</td>
</tr>
<tr>
<td>Logic, Semantics and Verification</td>
<td>Computability and Logic</td>
<td>recommended</td>
</tr>
<tr>
<td>Programming Languages and Software Security</td>
<td>Compilation</td>
<td>required</td>
</tr>
<tr>
<td>Ubiquitous Computing and Interaction</td>
<td>Distributed Systems and Security</td>
<td>recommended</td>
</tr>
</tbody>
</table>
### Example 1:

**Advanced Machine Learning and Data Science** + **Data-Intensive Systems**

<table>
<thead>
<tr>
<th>1. Sem (Fall)</th>
<th>Deep Learning for Visual Recognition (10 ECTS)</th>
<th>Data Visualization (10 ECTS)</th>
<th>Elective 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sem (Spring)</td>
<td>Cluster Analysis (10 ECTS)</td>
<td>Data Mining (10 ECTS)</td>
<td>Elective 2</td>
</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Algorithms, Incentives, and Data (10 ECTS)</td>
<td>Advanced Data Management and Analysis (10 ECTS)</td>
<td>Elective 3</td>
</tr>
<tr>
<td>4. Sem (Spring)</td>
<td>Thesis (30 ECTS)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>1. Sem (Fall)</th>
<th>Deep Learning for Visual Recognition (10 ECTS)</th>
<th>Data Visualization (10 ECTS)</th>
<th>Machine Learning (10 ECTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sem (Spring)</td>
<td>Cluster Analysis (10 ECTS)</td>
<td>Data Mining (10 ECTS)</td>
<td>Elective 1</td>
</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Algorithms, Incentives, and Data (10 ECTS)</td>
<td>Advanced Data Management and Analysis (10 ECTS)</td>
<td>Elective 2</td>
</tr>
<tr>
<td>4. Sem (Spring)</td>
<td>Thesis (30 ECTS)</td>
<td></td>
<td></td>
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</tbody>
</table>
## EXAMPLE 2:

### Programming Languages and Software Security + Logic, Semantics and Verification

<table>
<thead>
<tr>
<th>1. Sem (Fall)</th>
<th>Program Analysis (10 ECTS)</th>
<th>Formal Software Verification (10 ECTS)</th>
<th>Elective 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sem (Spring)</td>
<td>Language-based Security (10 ECTS)</td>
<td>Algorithmic Model Checking (10 ECTS)</td>
<td>Elective 2</td>
</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Advanced Topics in Programming Language Theory (10 ECTS)</td>
<td>Program Logics (10 ECTS)</td>
<td>Elective 3</td>
</tr>
<tr>
<td>4. Sem (Spring)</td>
<td></td>
<td></td>
<td>Thesis (30 ECTS)</td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>1. Sem (Fall)</th>
<th>Compilation (10 ECTS)</th>
<th>Formal Software Verification (10 ECTS)</th>
<th>Elective 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sem (Spring)</td>
<td>Language-based Security (10 ECTS)</td>
<td>Algorithmic Model Checking (10 ECTS)</td>
<td>Computability and Logic (10 ECTS)</td>
</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Advanced Topics in Programming Language Theory (10 ECTS)</td>
<td>Program Logics (10 ECTS)</td>
<td>Program Analysis (10 ECTS)</td>
</tr>
<tr>
<td>4. Sem (Spring)</td>
<td></td>
<td></td>
<td>Thesis (30 ECTS)</td>
</tr>
</tbody>
</table>
### Example 3:

#### Human-Computer Interaction + Ubiquitous Computing and Interaction

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>ECTS</th>
<th>Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sem (Fall)</td>
<td>Interactivity and Computer Mediation – Concepts, Theories, Methods, Cases</td>
<td>10</td>
<td>Elective 1</td>
</tr>
<tr>
<td>1. Sem (Fall)</td>
<td>Building the Internet of Things with P2P and Cloud Computing</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2. Sem (Spring)</td>
<td>Designing Interactive Technologies</td>
<td>10</td>
<td>Elective 2</td>
</tr>
<tr>
<td>2. Sem (Spring)</td>
<td>Augmented Reality + Advanced Augmented Reality Project</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Engineering Interactive Technologies</td>
<td>10</td>
<td>Elective 3</td>
</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Data Visualization</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4. Sem (Spring)</td>
<td>Thesis</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>ECTS</th>
<th>Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sem (Fall)</td>
<td>Human-Computer Interaction</td>
<td>10</td>
<td>Distributed Systems and Security</td>
</tr>
<tr>
<td>1. Sem (Fall)</td>
<td>Data Visualization</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2. Sem (Spring)</td>
<td>Designing Interactive Technologies</td>
<td>10</td>
<td>Elective 1</td>
</tr>
<tr>
<td>2. Sem (Spring)</td>
<td>Augmented Reality + Advanced Augmented Reality Project</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Multimodal Interaction</td>
<td>10</td>
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</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Building the Internet of Things with P2P and Cloud Computing</td>
<td>10</td>
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<tr>
<td>4. Sem (Spring)</td>
<td>Thesis</td>
<td>30</td>
<td></td>
</tr>
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</table>

*Note: ECTS = European Credit Transfer System*
# EXAMPLE 4:

<table>
<thead>
<tr>
<th>1. Sem (Fall)</th>
<th>2. Sem (Spring)</th>
<th>3. Sem (Fall)</th>
<th>4. Sem (Spring)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Algorithmics</strong></td>
<td><strong>Cryptology</strong></td>
<td><strong>Elective</strong></td>
<td></td>
</tr>
<tr>
<td>Randomized Algorithms (10 ECTS)</td>
<td>Systems Security (10 ECTS)</td>
<td>Systems Security (10 ECTS)</td>
<td></td>
</tr>
<tr>
<td>Theory of Algorithms and Computational Complexity (10 ECTS)</td>
<td>Cryptographic Computing (10 ECTS)</td>
<td>Quantum Information Processing (10 ECTS)</td>
<td></td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>1. Sem (Fall)</th>
<th>2. Sem (Spring)</th>
<th>3. Sem (Fall)</th>
<th>4. Sem (Spring)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Algorithmics</strong></td>
<td><strong>Cryptology</strong></td>
<td><strong>Distributed Systems and Security (10 ECTS)</strong></td>
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</tr>
<tr>
<td>Randomized Algorithms (10 ECTS)</td>
<td>Optimization (10 ECTS)</td>
<td>Optimization (10 ECTS)</td>
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</tr>
<tr>
<td>Theory of Algorithms and Computational Complexity (10 ECTS)</td>
<td>Cryptographic Computing (10 ECTS)</td>
<td>Quantum Information Processing (10 ECTS)</td>
<td></td>
</tr>
</tbody>
</table>
### EXAMPLE 5:

#### Formal Methods for Security

<table>
<thead>
<tr>
<th>1. Sem (Fall)</th>
<th>Formal Software Verification (10 ECTS)</th>
<th>Cryptology (10 ECTS)</th>
<th>Elective 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Sem (Fall)</td>
<td>Advanced Topics in Programming Language Theory (10 ECTS)</td>
<td>Cryptographic Computing (10 ECTS)</td>
<td>Elective 3</td>
</tr>
<tr>
<td>4. Sem (Spring)</td>
<td>Thesis (30 ECTS)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>1. Sem (Fall)</th>
<th>Compilation (10 ECTS)</th>
<th>Cryptology (10 ECTS)</th>
<th>Distributed Systems and Security (10 ECTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sem (Spring)</td>
<td>Language-based Security (10 ECTS)</td>
<td>Cryptologic Protocol Theory (10 ECTS)</td>
<td>Computability and Logic (10 ECTS)</td>
</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Advanced Topics in Programming Language Theory (10 ECTS)</td>
<td>Cryptographic Computing (10 ECTS)</td>
<td>Formal Software Verification (10 ECTS)</td>
</tr>
<tr>
<td>4. Sem (Spring)</td>
<td>Thesis (30 ECTS)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ELECTIVE COURSES
ELECTIVE COURSES
APART FROM SPECIALIZATIONS

Fall & Spring
- Bachelor level courses
- Project work in Computer Science (5 or 10 ECTS)
- Erhvervsprojekt / Vocational Training Project at the Department of Computer Science (10 ECTS)

Courses aimed at high school teaching
Spring
- Informatikkens fagdidaktik (5 ECTS)

Fall & Spring
- Praktik som gymnasielærer (5 ECTS)
ELECTIVE COURSES

Courses at other AU departments

• Mathematics (Nat)
• Computer Engineering (Tech)
• Digital Design and Information Studies (Arts)

If you fail an exam in an elective course, then that course has become mandatory!
If you have made an erroneous choice of an elective course please contact us for guidance immediately!
ELECTIVE COURSES

MATHEMATICS

Fall

- Indledende Algebra 1+2 (5+5 ECTS)
  - Introductory algebra – sufficient for basic use in computer science
- Algebra (10 ECTS)
  - Abstract algebra – relevant for more advanced study of Cryptology and advanced Programming Languages (Category Theory)
  - Algebra has Indledende Algebra as a prerequisite
- Mathematical Analysis 1 (10 ECTS)
  - Graph Theory 2 (10 ECTS) (not every year)

Spring

- Mathematical Statistics (10 ECTS)
- Mathematical Analysis 2 (10 ECTS)
  - Mixed Integer Optimization (10 ECTS) (not every year)
  - Advanced Convex Optimization (10 ECTS) (not every year)
ELECTIVE COURSES
COMPUTER ENGINEERING

Fall
• Embedded Real Time Systems (10 ECTS)
• Modelling of Critical Systems (5 ECTS)
• Wireless Sensor Networks (5 ECTS)

Spring
• Modelling and Verification (10 ECTS)
• Internet of Things Technology (10 ECTS)
• System Engineering (5 ECTS)
• Decision Support Systems (5 ECTS)

Worried about prerequisites for engineering courses?
• Check course catalogue
• Contact course responsible, or
• Contact program responsible Qi Zhang qz@ece.au.dk
ELECTIVE COURSES
DIGITAL DESIGN AND INFORMATION STUDIES

Fall
- Data and Digital Culture (10 ECTS)
- Design som kritisk praksis (10 ECTS)

Spring
- Lyd og Interaktion (10 ECTS)
- 3D-interaktion (10 ETCS)

Note that courses from Arts require skill academic writing and text analysis in the tradition of humanities.
STUDY ABROAD
### MSc program with study abroad semester

- Suffices to have a single specialization
- A specialization may be finished abroad by taking a course within the relevant area
- Recommendation: start by having two specializations, so you can finish these if you do not succeed in going abroad
- Additional information - [www.cs.au.dk/study](http://www.cs.au.dk/study)
ADMISSION
ADMISSION

• When bachelor completed
• You apply for admission into Master’s Program
  • Deadline 1 March
• ... or apply for admission into PhD studies
• Admission
  • You must actively apply for admission
  • You must actively apply for SU
  • Making a study program (contract) does not suffice

https://kandidat.au.dk/optagelse/ansoegning/
TEMPORARY ADMISSION

• If you lack X<30 ECTS in your bachelor, you may for a 6 months period take 30-X ECTS courses to be part of your future Master’s Program
• No temporary admission if you still lack a mandatory course and you have failed it twice!
• Never delay (re)examination in a mandatory course!
• This might have SU-related consequences!
PHD STUDIES

Apply for PhD studies

- [https://phd.nat.au.dk/programmes/computer-science/](https://phd.nat.au.dk/programmes/computer-science/)
- You receive a salary while studying!
- Apply for PhD studies directly following your Bachelor's degree, during your Master's studies or following your Master's degree.
- For deadlines see [https://phd.nat.au.dk/for-applicants/](https://phd.nat.au.dk/for-applicants/)
- Contact Anders Møller for info [http://pure.au.dk/portal/en/amoeller@cs.au.dk](http://pure.au.dk/portal/en/amoeller@cs.au.dk)
EXTERNAL COLLABORATION AND STUDENT ENTREPRENEURSHIP
EXTERNAL COLLABORATION

Types of collaboration

• Vocational Training Project
• Bachelor’s project
• Master’s Thesis
• In connection with a specific course

General information regarding collaboration and external partners

• Find a company and a main supervisor from AU who will be part of the project
• Check whether you need additional contracts (Fast Track), NDA’s or copyright
• Create a contract for Vocational Training Project via projectgenerator

Further information: https://studerende.au.dk/en/studies/subject-portals/computer-science/project-collaboration
Student Entrepreneurship at CS

HatchIT Lab
- Local student entrepreneurship hub at CS
- Office Space and access to facilities at CS Dept.
- Networking with other CS student startups
- HatchITlab.au.dk

The Kitchen AU
- Central AU Entrepreneurship hub
- Funding support
- Business developers and advisors/mentors
- Workshops and events for entrepreneurs
- Thekitchen.io
HatchIT Lab
Student Entrepreneurship at CS

50+ Student Entrepreneurs

10+ mio dkk Investment and external funding

50+ Jobs created
STUDENT JOBS

www.cs.au.dk/jobwall
www.cs.au.dk/businessclub
PRACTICAL INFORMATION
CONTRACTS

Study Contract

• Complete before signing up for first course in Master’s Program
  • Also in case of temporary admission
  • You may only sign up for courses mentioned in your contract
• Revise at semiannual interviews in April and October
  • You will receive an email invitation
  • You will have a friendly chat with Andreas and Søren

Project Work Contract

• In addition to signing up for a project work / vocational training project (erhvervsprojekt) you must also make a contract

Thesis Contract

• Fill out at start of thesis work

All contracts are created through: http://kontrakt.nattech.au.dk/

Steps:
1. Decide on course for the coming semester
2. Submit a master contract and have it approved
3. Register for course before the deadline
SIGNING UP FOR COURSES

Sign up

• May 1-5 for courses in the Fall
• November 1-5 for courses in the Spring
• Advance approval of credit transfer is needed for courses from outside Nat-Tech,
  • Apply well in advance!
  • Advance approval of credit transfer is no guarantee that you will be admitted to the course!

Schedule for elective courses

• Watch out for collisions
• You may find the schedule for courses offered by the Department of Computer Science at https://timetable.au.dk/
IMPORTANT RULES

• If you follow the recommended program of study (30 ECTS per semester), take courses in the correct order (the Box Diagrams) and pass all courses at the ordinary exam or at the first scheduled re-exam then you need not worry about the study progress reform.
• If you fall behind or do not pass a course at the latest by the first reexamination, then contact us for advice and guidance on your individual study program.
• If you ignore this advice and believe that “it will be fine”, it may have serious consequences!
• If you do not complete your master’s program within six months after the prescribed time you are automatically signed out of the study program / out of the university https://studerende.au.dk/en/studies/subject-portals/computer-science/rules-and-guidelines/maximum-duration-of-study.
• If you fail an exam in an elective course, then that course has become mandatory! If you have made an erroneous choice of an elective course, please contact us for guidance immediately!
STUDENT COUNSELOR

Nikolaj Beck Mikkelsen

- [www.cs.au.dk/vejleder](http://www.cs.au.dk/vejleder)

Possible topics

- Change of study program, delay, leave of absence, withdrawal.
- Illness.
- Study regulations
- Selecting supplementary subjects.
YOU CAN HAVE INFLUENCE!

Education Committee
Develop the study program and the course
  • [http://cs.staff.au.dk/boards-and-committees/education-committee/](http://cs.staff.au.dk/boards-and-committees/education-committee/)

Office Committee
Develop the study environment, student offices and campus