MASTER’S DEGREE PROGRAM
COMPUTER SCIENCE
MASTER’S DEGREE PROGRAM

1. Admission
2. Structure of the Master’s Degree Program
   I. Box diagram
   II. Specializations
   III. Elective courses
   IV. Requirements for the study program
3. Study abroad
4. External Collaboration
5. Practical information

Link to current slides: 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 less than 30 ECTS in your bachelor, you may for a 6 months period take up to 30 ECTS courses to be part of your future Master’s Program
• You cannot get temporary admission if you still lack a mandatory course and you have failed it twice.
• Never delay (re)examination in a mandatory course.
• If you get temporary admission, it might have SU-related consequences. Remember to clarify the consequences before applying.
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 you 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)
STRUCTURE
## Structure of Master’s Degree Program

<table>
<thead>
<tr>
<th>Semester</th>
<th>Specialization 1 (30 ECTS)</th>
<th>Specialization 2 (30 ECTS)</th>
<th>Elective (30 ECTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Semester</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Semester</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Semester</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th Semester</td>
<td></td>
<td></td>
<td>Thesis (30 ECTS)</td>
</tr>
</tbody>
</table>

### 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
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
ALGORITHMS

<table>
<thead>
<tr>
<th>Semester (Year)</th>
<th>Course Title</th>
<th>Credits</th>
<th>Instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Sem (Fall)</td>
<td>Computational Geometry: Theory and Experimentation (10 ECTS)</td>
<td>PA</td>
<td></td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Randomized Algorithms (10 ECTS)</td>
<td>KGL + IC</td>
<td></td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Theory of Algorithms and Computational Complexity (10 ECTS) OR Quantum Information Processing (10 ECTS)</td>
<td>KAH IBD</td>
<td></td>
</tr>
</tbody>
</table>

- 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
**CRYPTOGRAPHY**

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

- 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 Title</th>
<th>ECTS</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></td>
<td></td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Data Mining (10 ECTS) *</td>
<td>DM</td>
<td></td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Advanced Data Management and Analysis (10 ECTS)</td>
<td>IA</td>
<td></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
- Davide Mottin
- Ira Assent
## HUMAN-COMPUTER INTERACTION

<table>
<thead>
<tr>
<th>Semester (Fall)</th>
<th>Course Description</th>
<th>Offered By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Sem (Fall)</td>
<td>Interactivity and Computer Mediation – Concepts, Theories, Methods, Cases (10 ECTS)</td>
<td>OB</td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Designing Interactive Technologies (10 ECTS)</td>
<td>NE</td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Multimodal Interaction (10 ECTS) OR Engineering Interactive Technologies (10 ECTS)</td>
<td>EH MW</td>
</tr>
</tbody>
</table>

- Semesters are independent – can be taken in any order

### Collaboration and Computer-Human Interaction
- Clemens Nylandsted Klokmose
- Eve Hoggan
- 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

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![Image of professors]
PROGRAMMING LANGUAGES AND SOFTWARE SECURITY

<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>Program Analysis (10 ECTS)</td>
<td>AM + AP</td>
<td></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>JvdP + AP</td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Algorithmic Model Checking (10 ECTS)</td>
<td>JvdP + AP</td>
<td></td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Program Logics (10 ECTS)</td>
<td>AT + LB</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
### UBIQUITOUS COMPUTING AND INTERACTION

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

• Semesters are independent – can be taken in any order

**Collaboration and Computer-Human Interaction**
- Clemens Nylandsted Klokmose
- Eve Hoggan
- 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>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Sem (Fall)</td>
<td>Evolutionary Thinking (10 ECTS)</td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Algorithms in Bioinformatics (10 ECTS)</td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Data Science in Bioinformatics (10 ECTS) OR Topics in Bioinformatics (10 ECTS) [New in 2024]</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>Data Science in Bioinformatics (10 ECTS)</td>
</tr>
<tr>
<td>2nd Sem (Spring)</td>
<td>Statistical and Machine Learning in Bioinformatics (10 ECTS)</td>
</tr>
<tr>
<td>3rd Sem (Fall)</td>
<td>Evolutionary Thinking (10 ECTS) OR Topics in Bioinformatics (10 ECTS) [New in 2024]</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
### SPECIALIZATIONS: PREREQUISITES

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>
EXAMPLES
## EXAMPLE 1:

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

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

**Human-Computer Interaction** + **Ubiquitous computing and Interaction**

<table>
<thead>
<tr>
<th>Sem (Fall)</th>
<th>Interactivity and Computer Mediation – Concepts, Theories, Methods, Cases (10 ECTS)</th>
<th>Building the Internet of Things with P2P and Cloud Computing (10 ECTS)</th>
<th>Elective 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sem (Spring)</td>
<td>Designing Interactive Technologies (10 ECTS)</td>
<td>Augmented Reality (5 ECTS) + Advanced Augmented Reality Project (5 ECTS)</td>
<td>Elective 2</td>
</tr>
<tr>
<td>3. Sem (Fall)</td>
<td>Engineering Interactive Technologies (10 ECTS)</td>
<td>Data Visualization (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>Sem (Fall)</th>
<th>Human-Computer Interaction (10 ECTS)</th>
<th>Data Visualization (10 ECTS)</th>
<th>Distributed Systems and Security (10 ECTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Sem (Spring)</td>
<td>Designing Interactive Technologies (10 ECTS)</td>
<td>Augmented Reality (5 ECTS) + Advanced Augmented Reality Project (5 ECTS)</td>
<td>Elective 1</td>
</tr>
<tr>
<td>4. Sem (Spring)</td>
<td></td>
<td></td>
<td>Thesis (30 ECTS)</td>
</tr>
<tr>
<td>Semester</td>
<td>Course</td>
<td>Credits</td>
<td>Elective</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------------------</td>
<td>---------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Fall 1</td>
<td>Computational Geometry: Theory and Experimentation</td>
<td>10</td>
<td>Cryptology (10 ECTS)</td>
</tr>
<tr>
<td>Spring 2</td>
<td>Randomized Algorithms</td>
<td>10</td>
<td>Systems Security (10 ECTS)</td>
</tr>
<tr>
<td>Fall 3</td>
<td>Theory of Algorithms and Computational Complexity</td>
<td>10</td>
<td>Cryptographic Computing (10 ECTS)</td>
</tr>
<tr>
<td>Spring 4</td>
<td>Thesis</td>
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</table>

**OR**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Credits</th>
<th>Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 1</td>
<td>Computational Geometry: Theory and Experimentation</td>
<td>10</td>
<td>Cryptology (10 ECTS)</td>
</tr>
<tr>
<td>Spring 2</td>
<td>Randomized Algorithms</td>
<td>10</td>
<td>Cryptologic Protocol Theory (10 ECTS)</td>
</tr>
<tr>
<td>OR</td>
<td>Systems Security (10 ECTS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall 3</td>
<td>Theory of Algorithms and Computational Complexity</td>
<td>10</td>
<td>Cryptographic Computing (10 ECTS)</td>
</tr>
<tr>
<td>Spring 4</td>
<td>Thesis</td>
<td>30</td>
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</tr>
</tbody>
</table>
## EXAMPLE 5:

### Formal Methods for Security

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fall</td>
<td>Formal Software Verification (10 ECTS)</td>
<td>Cryptology (10 ECTS)</td>
<td>Elective 1</td>
</tr>
<tr>
<td>3. 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. Spring</td>
<td></td>
<td></td>
<td>Thesis (30 ECTS)</td>
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</tbody>
</table>

### OR

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course 1</th>
<th>Course 2</th>
<th>Course 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fall</td>
<td>Compilation (10 ECTS)</td>
<td>Cryptology (10 ECTS)</td>
<td>Distributed Systems and Security (10 ECTS)</td>
</tr>
<tr>
<td>2. 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. 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. Spring</td>
<td></td>
<td></td>
<td>Thesis (30 ECTS)</td>
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ELECTIVE COURSES
ELECTIVE COURSES
APART FROM SPECIALIZATIONS

Department of Computer Science - apart from specializations

• Bachelor level courses
• Summer university 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)

For courses in the summer, see https://studerende.au.dk/en/summeruniversity
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)
- Explainable Statistical Learning (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 ECTS)

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
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 project generator

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
MASTER’S DEGREE PROGRAMME FOR WORKING PROFESSIONALS

• Part-time option spanning four years for employed individuals
• The degree programme for working professionals mirrors the ordinary full-time master’s degree programme

Admission requirements

1. Meet the academic admission requirements. The requirements for the degree programme for working professionals are the same as the two-year master’s degree programme.

2. Have a documented contract of employment with a public or private employer stating that the applicant is employed in a relevant job alongside their studies for no less than 25 hours a week on average (prescribed annual hours) and based on a relevant bachelor’s. Alternatively, you must be an entrepreneur and run an academically relevant independent business with revenue and income-generating activities.
PRACTICAL INFORMATION
CONTRACTS

Study Contract

• Complete the contract before signing up for the first course(s)
  • 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/
ADVICE

• 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 ua@cs.au.dk or the student counselor for advice and guidance on your individual study program as soon as possible. The earlier you reach out the better.

• You have a max study time, 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 ua@cs.au.dk or the student counselor for guidance immediately!
STUDENT COUNSELOR

Nikolaj Beck Mikkelsen

- [www.cs.au.dk/vejleder](http://www.cs.au.dk/vejleder)
- [Studievejledning4.nat-tech@au.dk](mailto:Studievejledning4.nat-tech@au.dk)

Possible topics

- Change of study program, delay, leave of absence, withdrawal.
- Illness.
- Study regulations
- Selecting supplementary subjects.