Specialisation: Mathematics

<table>
<tr><th>Sem.</th><th colspan="5">Module</th></tr>
<tr><td>1.</td><td colspan="2">Foundations of Higher Mathematics
14 Cr.</td><td>Introduction to Programming
8 Cr.</td><td>Logic and Argumentation Theory
5 Cr.</td><td rowspan="2">Introduction to Specialisations
8 Cr.</td></tr>
<tr><td>2.</td><td>Mathematical Analysis
9 Cr.</td><td>Linear Algebra
5 Cr.</td><td>Theoretical Computer Science I
8 Cr.</td><td>Algorithms and Data Structures
5 Cr.</td></tr>
<tr><td>3.</td><td>Introduction to Numerical Mathematics
8 Cr.</td><td>Data Analysis and Deep Learning in Python
5 Cr.</td><td>Graph Processing and Machine Learning
5 Cr.</td><td>General Physics I
5 Cr.</td><td>General Chemistry I
or
Process Mining I
5 Cr.</td></tr>
<tr><td>4.</td><td rowspan="3">Mathematics Free Elective Modules
24 Cr.</td><td rowspan="2">Introduction to Areas of Mathematics Compulsory Elective Modules A
16 Cr.</td><td rowspan="3">Advanced Topics in Mathematics Compulsory Elective Modules B
20 Cr.</td><td>Probability Theory and Statistics
10 Cr.</td><td></td></tr>
<tr><td>5.</td><td></td><td></td></tr>
<tr><td>6.</td><td>Mathematics Seminar
5 Cr.</td><td colspan="2">Bachelor Thesis & Colloquium
12 Cr. + 3 Cr.</td></tr>
</table>

A. Basic Modules Mathematics 28 Cr.	D. Advanced Modules Mathematics 59 Cr.
B. Basic Modules Computer Science 31 Cr.	E. Advanced Modules Computer Science 0 Cr.
C. Basic Modules Specialisations 23 Cr.	F. Advanced Modules Specialisations 0 Cr.
G. Additional Modules 24 Cr.	H. Bachelor Thesis & Colloquium 15 Cr.

Specialisation: Computer Science

<table>
<tr><th>Sem.</th><th colspan="5">Module</th></tr>
<tr><td>1.</td><td colspan="2">Foundations of Higher Mathematics
14 Cr.</td><td>Introduction to Programming
8 Cr.</td><td>Logic and Argumentation Theory
5 Cr.</td><td rowspan="2">Introduction to Specialisations
8 Cr.</td></tr>
<tr><td>2.</td><td>Mathematical Analysis
9 Cr.</td><td>Linear Algebra
5 Cr.</td><td>Theoretical Computer Science I
8 Cr.</td><td>Algorithms and Data Structures
5 Cr.</td></tr>
<tr><td>3.</td><td>Introduction to Numerical Mathematics
8 Cr.</td><td>Data Analysis and Deep Learning in Python
5 Cr.</td><td>Graph Processing and Machine Learning
5 Cr.</td><td>General Physics I
5 Cr.</td><td>General Chemistry I
or
Process Mining I
5 Cr.</td></tr>
<tr><td>4.</td><td>Probability Theory and Statistics
10 Cr.</td><td rowspan="3">Selected Topics in Computer Science Compulsory Elective Modules
20Cr.</td><td>Software Engineering
8 Cr.</td><td>Individual Project
6 Cr.</td><td></td></tr>
<tr><td>5.</td><td rowspan="2">Computer Science Free Elective Modules
20 Cr.</td><td>Foundations of Data Management
5 Cr.</td><td>Team Project
6 Cr.</td><td></td></tr>
<tr><td>6.</td><td colspan="3">Bachelor Thesis & Colloquium
12 Cr. + 3 Cr.</td></tr>
</table>

A. Basic Modules Mathematics 28 Cr.	D. Advanced Modules Mathematics 18 Cr.
B. Basic Modules Computer Science 31 Cr.	E. Advanced Modules Computer Science 45 Cr.
C. Basic Modules Specialisations 23 Cr.	F. Advanced Modules Specialisations 0 Cr.
G. Additional Modules 20 Cr.	H. Bachelor Thesis & Colloquium 15 Cr.

Specialisation: Natural- and Life Sciences

<table>
<tr><th>Sem.</th><th colspan="5">Module</th></tr>
<tr><td>1.</td><td colspan="2">Foundations of Higher Mathematics
14 Cr.</td><td>Introduction to Programming
8 Cr.</td><td>Logic and Argumentation Theory
5 Cr.</td><td rowspan="2">Introduction to Specialisations
8 Cr.</td></tr>
<tr><td>2.</td><td>Mathematical Analysis
9 Cr.</td><td>Linear Algebra
5 Cr.</td><td>Theoretical Computer Science I
8 Cr.</td><td>Algorithms and Data Structures
5 Cr.</td></tr>
<tr><td>3.</td><td>Introduction to Numerical Mathematics
8 Cr.</td><td>Data Analysis and Deep Learning in Python
5 Cr.</td><td rowspan="2">General Physics I & II
10 Cr.</td><td rowspan="2">General Chemistry I & II
10 Cr.</td><td>Graph Processing and Machine Learning
5 Cr.</td></tr>
<tr><td>4.</td><td>Probability Theory and Statistics
10 Cr.</td><td rowspan="3">N&LS Free Elective Modules
20 Cr.</td><td>General Life Sciences
5 Cr.</td></tr>
<tr><td>5.</td><td>Numerics of PDEs
10 Cr.</td><td>General Physics Lab.
5 Cr.</td><td>General Chemistry Lab.
5 Cr.</td><td></td></tr>
<tr><td>6.</td><td>Research Internship
10 Cr.</td><td colspan="3">Bachelor Thesis & Colloquium
12 Cr. + 3 Cr.</td></tr>
</table>

A. Basic Modules Mathematics 28 Cr.	D. Advanced Modules Mathematics 28 Cr.
B. Basic Modules Computer Science 31 Cr.	E. Advanced Modules Computer Science 0 Cr.
C. Basic Modules Specialisations 33 Cr.	F. Advanced Modules Specialisations 25 Cr.
G. Additional Modules 20 Cr.	H. Bachelor Thesis & Colloquium 15 Cr.

Specialisation: Applied AI/Data Science

<table>
<tr><td>Sem.</td><td colspan="5">Module</td></tr>
<tr><td>1.</td><td colspan="2">Foundations of Higher Mathematics
14 Cr.</td><td>Introduction to Programming
8 Cr.</td><td>Logic and Argumentation Theory
5 Cr.</td><td rowspan="2">Introduction to Specialisations
8 Cr.</td></tr>
<tr><td>2.</td><td>Mathematical Analysis
9 Cr.</td><td>Linear Algebra
5 Cr.</td><td>Theoretical Computer Science I
8 Cr.</td><td>Algorithms and Data Structures
5 Cr.</td></tr>
<tr><td>3.</td><td colspan="2">Applied AI
12 Cr.</td><td>Data Analysis and Deep Learning in Python
5 Cr.</td><td>Graph Processing and Machine Learning
5 Cr.</td><td>Process Mining I
5 Cr.</td></tr>
<tr><td>4.</td><td>Probability Theory and Statistics
10 Cr.</td><td>Human-AI Collaboration
6 Cr.</td><td rowspan="2">Applied Data Analysis
I & II
10 Cr.</td><td>Introduction to Practical Philosophy
5 Cr.</td><td>Process Mining II
5 Cr.</td></tr>
<tr><td>5.</td><td rowspan="2">Foundations of Entrepeneur-ship I & II
10 Cr.</td><td rowspan="2">AI&DS Free Elective Modules
20 Cr.</td><td>Data Science Project
5 Cr.</td><td></td></tr>
<tr><td>6.</td><td>Seminar Applied AI
5 Cr.</td><td colspan="2">Bachelor Thesis & Colloquium
12 Cr. + 3 Cr.</td></tr>
</table>

A. Basic Modules Mathematics 28 Cr.	D. Advanced Modules Mathematics 10 Cr.
B. Basic Modules Computer Science 31 Cr.	E. Advanced Modules Computer Science 0 Cr.
C. Basic Modules Specialisations 30 Cr.	F. Advanced Modules Specialisations 46 Cr.
G. Additional Modules 20 Cr.	H. Bachelor Thesis & Colloquium 15 Cr.

Specialisation: Human-Centered Data Science

<table>
<tr><th>Sem.</th><th colspan="6">Module</th></tr>
<tr><td>1.</td><td colspan="2">Foundations of Higher Mathematics
14 Cr.</td><td>Introduction to Programming
8 Cr.</td><td>Logic and Argumentation Theory
5 Cr.</td><td rowspan="2">Introduction to Specialisations
8 Cr.</td></tr>
<tr><td>2.</td><td>Mathematical Analysis
9 Cr.</td><td>Linear Algebra
5 Cr.</td><td>Theoretical Computer Science I
8 Cr.</td><td>Algorithms and Data Structures
5 Cr.</td></tr>
<tr><td>3.</td><td colspan="2">Applied AI
12 Cr.</td><td>Basics of Data Analysis
5 Cr.</td><td>Data Analysis and Deep Learning in Python
5 Cr.</td><td>Graph Processing and Machine Learning
5 Cr.</td></tr>
<tr><td>4.</td><td>Probability Theory and Statistics
5 Cr.</td><td rowspan="2">HCDS Free Elective Modules
20 Cr.</td><td rowspan="2">Applied Data Analysis I & II
10 Cr.</td><td>Introduction to Practical Philosophy
5 Cr.</td><td>Qualitative Research Methods
5 Cr.</td></tr>
<tr><td>5.</td><td>AI in Society
5 Cr.</td><td colspan="2">Philosophy of Social Science
10 Cr.</td></tr>
<tr><td>6.</td><td colspan="2">Digital Humanities / Computational Social Science Lab
10 Cr.</td><td>Critical Data Studies
6 Cr.</td><td colspan="2">Bachelor Thesis & Colloquium
12 Cr. + 3 Cr.</td></tr>
</table>

A. Basic Modules Mathematics 28 Cr.	D. Advanced Modules Mathematics 5 Cr.
B. Basic Modules Computer Science 31 Cr.	E. Advanced Modules Computer Science 0 Cr.
C. Basic Modules Specialisations 30 Cr.	F. Advanced Modules Specialisations 51 Cr.
G. Additional Modules 20 Cr.	H. Bachelor Thesis & Colloquium 15 Cr.