Programme-specific Section of the Curriculum for the MSc Programme in Mathematics at the Faculty of Science, University of Copenhagen 2009 (Rev. 2017)

Contents

1 Title, affiliation and language .......................................................................................................................... 2
   1.1 Title ...................................................................................................................................................... 2
   1.2 Affiliation .............................................................................................................................................. 2
   1.3 Corps of external examiners .................................................................................................................. 2
   1.4 Language ............................................................................................................................................. 2
2 Academic profile ............................................................................................................................................... 2
   2.1 Purpose .................................................................................................................................................. 2
   2.2 General programme profile .................................................................................................................. 2
   2.3 General structure of the programme .................................................................................................... 2
   2.4 Career opportunities ............................................................................................................................. 3
3 Description of competence profiles .................................................................................................................. 3
   3.1 General profile in mathematics ........................................................................................................... 3
   3.2 Nordic Double Degree in Didactics of Mathematics ........................................................................... 3
4 Admission requirements .................................................................................................................................. 4
   4.1 Applicants with a Bachelor’s degree in Mathematics .......................................................................... 4
   4.2 Applicants with a Bachelor’s degree in Science and IT ........................................................................ 4
   4.3 Applicants with a closely related Bachelor’s degree ............................................................................ 4
   4.4 Applicants with a related Bachelor’s degree ........................................................................................ 4
   4.5 Other applicants ................................................................................................................................... 4
   4.5 Language requirements ......................................................................................................................... 4
5 Prioritisation of applicants ................................................................................................................................ 5
6 Structure of the programme .............................................................................................................................. 5
   6.1 General profile in Mathematics ........................................................................................................... 5
   6.2 Nordic Double Degree in Didactics of Mathematics (1st year at UCPH) ......................................... 7
   6.3 Nordic Double Degree in Didactics of Mathematics (1st year at Agder) ....................................... 8
7 Exemptions ....................................................................................................................................................... 9
8 Commencement etc. ......................................................................................................................................... 9
   8.1 Validity .................................................................................................................................................. 9
   8.2 Transfer ................................................................................................................................................ 9
   8.3 Amendments ......................................................................................................................................... 9
Appendix 1 Tables .............................................................................................................................................. 10
Appendix 2 Interim arrangements .................................................................................................................... 12
Appendix 3 Description of objectives for the thesis .......................................................................................... 19
1 Title, affiliation and language
A shared section that applies to all BSc and MSc Programmes at the Faculty of Science is linked to this programme-specific curriculum.

1.1 Title
The MSc Programme in Mathematics with a general profile in mathematics leads to a Master of Science (MSc) in Mathematics with the Danish title: Cand.scient. (candidatus/candidata scientiarum) i matematik.

The MSc Programme in Mathematics with a specialisation in Nordic Double Degree in Didactics of Mathematics leads to a Master of Science (MSc) in Mathematics with a specialisation in Nordic Double Degree in Didactics of Mathematics with the Danish title: Cand.scient. (candidatus/candidata scientiarum) i matematik med specialisering i matematikkens didaktik.

1.2 Affiliation
The programme is affiliated with the Study Board of Mathematics and Computer Science, and the students can both elect, and be elected, to this study board.

1.3 Corps of external examiners
The following corps of external examiners is used for the central parts of the MSc Programme:
- Corps of External Examiners for Mathematics (matematik).

1.4 Language
The language of this MSc Programme is English.

2 Academic profile
2.1 Purpose
The MSc programme in Mathematics is a research-based programme, the objective of which is to provide the student with the mathematical knowledge of and insights into the main fields and methodologies of mathematics required to work independently within this field. The compulsory study programme can form the basis of working also with applied mathematics as well as teaching mathematics.

2.2 General programme profile
The study programme allows in-depth study of various aspects of the mathematical core fields of algebra, analysis and geometry, but also more specialised mathematical disciplines, metadisciplines such as the history and didactics of mathematics as well as important applications within the natural and social sciences.

Mathematics is the key subject area of the programme.

2.3 General structure of the programme
The MSc Programme is set at 120 ECTS.

The MSc Programme in Mathematics consists of the following elements:
- Specialisation, 120 ECTS, including the thesis.

The student must choose one of the following specialisations:
- General profile in Mathematics.
- Nordic Double Degree in Didactics of Mathematics (1st year at UCPH).
- Nordic Double Degree in Didactics of Mathematics (1st year at Agder).
2.4 Career opportunities
The MSc Programme in Mathematics qualifies students to become professionals within business functions and/or areas such as:

- A PhD programme
- The financial sector.
- Software development.
- Teaching at upper secondary schools.

3 Description of competence profiles
Students following the MSc Programme acquire the knowledge, skills and competences listed below. Students will also acquire other qualifications through elective subject elements and other study activities.

3.1 General profile in mathematics
On completion of the programme, an MSc in Mathematics with a General profile in Mathematics has acquired the following:

Knowledge about:
- Advanced vector space theory.
- Selected research-active fields within mathematics.

Skills in/to:
- Read and understand mathematical original literature.
- Communicate mathematical issues on a scientific basis.
- Account orally and in writing for inquiries into open mathematical issues.

Competences in/to:
- Structure an inquiry into open mathematical issues and divide it into smaller easily accessible challenges.
- Conduct independent, stringent argumentation.
- Independently take responsibility for his or her own professional development and specialisation.
- Reflect on methodologies for analysing and solving mathematical issues at a scientific level.

3.2 Nordic Double Degree in Didactics of Mathematics
On completion of the programme, an MSc in Mathematics with a specialisation in Nordic Double Degree in Didactics of Mathematics has acquired the following:

Knowledge about:
- Advanced vector space theory.
- Selected research-active fields within mathematics, including didactics of mathematics.

Skills in/to:
- Read and understand mathematical original literature.
- Communicate mathematical and especially mathematical-didactic issues on a scientific basis.
- Account orally and in writing for inquiries into open mathematical issues.
- Account orally and in writing for empirical as well as approaches to studies of mathematical-didactic aspects of a particular case.
Competences in/to:

- Structure a study of open mathematical and mathematical-didactic questions and divide it into smaller easily accessible challenges.
- Conduct independent, stringent argumentation.
- Independently take responsibility for his or her own professional development and specialisation.
- Reflect on methodologies for analysing and solving mathematical and mathematical-didactic questions at a scientific level.

4 Admission requirements
With a Bachelor’s degree in Mathematics from the University of Copenhagen the student is granted reserved access and guaranteed a place on the MSc Programme in Mathematics if the student applies before the application deadline during the first application period after the completion of the Bachelor’s degree.

4.1 Applicants with a Bachelor’s degree in Mathematics
Applicants with a Bachelor’s degree in Mathematics from the University of Copenhagen, other Danish or Nordic universities are directly academically qualified for admission to the MSc Programme in Mathematics.

4.2 Applicants with a Bachelor’s degree in Science and IT
Applicants with a Bachelor’s degree in Natural Science and IT from the University of Copenhagen may be admitted if the programme includes:

- A specialisation in Mathematics or the MSc admission course package in Mathematics.

4.3 Applicants with a closely related Bachelor’s degree
Applicants with a Bachelor’s degree in Actuarial Mathematics, Mathematics-Economics or Statistics from the University of Copenhagen or other Danish or Nordic universities may also be admitted if their programme includes the following:

- Subject elements in algebra (at least 15 ECTS).
- Subject elements in geometry and topology (at least 15 ECTS).

4.4 Applicants with a related Bachelor’s degree
Applicants with a Bachelor’s degree in Computer Science, Physics or Chemistry from the University of Copenhagen or other Danish or international universities may also be admitted if their programme includes the following:

- Subject elements in mathematical analysis at least 30 ECTS
- Subject elements in linear algebra and algebra at least 22.5 ECTS
- Subject elements in geometry and topology at least 15 ECTS

4.5 Other applicants
The Faculty may also admit applicants who, after an individual academic assessment, are deemed to possess educational qualifications equivalent to those required in subclauses 4.1-4.

4.5 Language requirements

4.5.1 Applicants from Nordic universities
Applicants with a Bachelor's degree from Nordic universities must as a minimum document English language qualifications comparable to a Danish upper secondary school English B level.
4.5.2 Non-Nordic applicants
Applicants with a non-Nordic Bachelor’s degree must be able to document English proficiency corresponding to an IELTS test score of minimum 6.5 or a TOEFL test score of minimum 83 (Internet-based).

5 Prioritisation of applicants
If the number of qualified applicants to the programme exceeds the number of places available, applicants will be prioritised as follows:

1) Applicants with a Bachelor’s degree in Mathematics from the University of Copenhagen seeking admission by way of direct extension of their completed BSc programme.
2) Applicants with a Bachelor’s degree in Mathematics.
3) Applicants with a Bachelor’s degree in Actuarial Mathematics, Natural Science and IT or Mathematics-Economics from the University of Copenhagen.
4) Other applicants.

If the number of qualified applicants exceeds the number of places available, applicants are prioritised according to the following criteria (listed below in prioritised order):
- Total numbers of ECTS within mathematics and the grades obtained.

6 Structure of the programme
The compulsory subject elements, restricted elective subject elements and the thesis constitute the central parts of the programme (Section 21 of the Ministerial Order on Bachelor and Master’s Programmes (Candidatus) at Universities).

Before the beginning of the MSc Programme the student must choose the specialisation.

6.1 General profile in Mathematics
The general profile in Mathematics is set at 120 ECTS and consists of the following:
- Compulsory subject elements, 7.5 ECTS.
- Restricted elective subject elements, 52.5 ECTS.
- Elective subject elements, 30 ECTS.
- Thesis, 30 ECTS.

6.1.1 Compulsory subject elements
All of the following subject elements are to be covered (7.5 ECTS):
- NMAK15005U | Advanced Vector Spaces | AdVec | Block 1 | 7.5 ECTS

6.1.2 Restricted elective subject elements
52.5 ECTS are to be covered as restricted subject elements from the following two lists:

1) 22.5 ECTS are to be covered as restricted subject elements from the following list:
- NMAA05014U | Algebra 3 | Alg3 | Block 1 | 7.5 ECTS
- NMAA05038U | Algebraic Topology | AlgTop | Block 1 | 7.5 ECTS
- NFKA09006U | Advanced Didactics of Mathematics | DidMatV | Block 1 | 7.5 ECTS
- NMAK11003U | Advanced Probability Theory 1 | VidSand1 | Block 1 | 7.5 ECTS
- NMAK10008U | Functional Analysis | FunkAn | Block 2 | 7.5 ECTS
- NMAA06062U | Geometry 2 | Geom2 | Block 2 | 7.5 ECTS
- NMAK15016U | History of Mathematics 2 | Hist2 | Block 2 | 7.5 ECTS
- NMAK11011U | Advanced Probability Theory 2 | VidSand2 | Block 2 | 7.5 ECTS
2) 30 ECTS are to be covered as further restricted subject elements from the list above and by restricted subject elements from the following list:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAK14005U</td>
<td>Algebraic Geometry</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK14006U</td>
<td>Categories and Topology</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK16022U</td>
<td>Partial Differential Equations</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK16001U</td>
<td>Analytic Number Theory*</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK16008U</td>
<td>Experimental Mathematics*</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK13030U</td>
<td>Approximation Properties for Operator Algebras and Groups</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK16000U</td>
<td>Algebraic Geometry 2</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK15023U</td>
<td>Topics in Algebraic Topology</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK17011U</td>
<td>Algebraic Number Theory</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK17004U</td>
<td>Introduction to Descriptive Set Theory</td>
<td>Block 2</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK14020U</td>
<td>Quantum Information Theory</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK16007U</td>
<td>Elliptic Curves</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAA07012U</td>
<td>Introduction to Operator Algebras</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK14009U</td>
<td>Commutative Algebra</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAA13029U</td>
<td>Algebraic Topology 1.5: Cohomology</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK17002U</td>
<td>Complex Analysis 2</td>
<td>Block 3</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAA13036U</td>
<td>Introduction to Mathematical Logic</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK13013U</td>
<td>Lie Groups</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAA09039U</td>
<td>Algebraic Topology II</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAA13034U</td>
<td>Introduction to K-theory</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NMAK17009U</td>
<td>Topics in Algebra and Number Theory</td>
<td>Block 4</td>
<td>7.5 ECTS</td>
</tr>
</tbody>
</table>

* The course is not offered in the academic year 2017/18.

### 6.1.3 Elective subject elements

30 ECTS are to be covered as elective subject elements. All subject elements at MSc level may be included as elective subject elements in the MSc Programme.

BSc subject elements corresponding to 15 ECTS may be included in the MSc Programme.

Projects outside the course scope may be included in the elective section of the programme with up to 15 ECTS. The regulations are described in Appendix 5 to the shared section of the curriculum.

Projects in practice may be included in the elective section of the programme with 15 ECTS. The regulations are described in Appendix 4 to the shared section of the curriculum.

### 6.1.4 Thesis

The MSc Programme in Mathematics with a General Profile in Mathematics includes a thesis corresponding to 30 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

### 6.1.5 Academic mobility

The curriculum makes it possible to follow subject elements outside the Faculty of Science.
For students admitted in September the academic mobility for the MSc Programme in Mathematics with a General Profile in Mathematics is placed in block 1+2 of the 2nd year.

For students admitted in February the academic mobility for the MSc Programme in Mathematics with a General Profile in Mathematics is placed in block 3+4 of the 2nd year.

Academic mobility requires that the student follows the rules and regulations regarding pre-approval and credit transfer.

In addition the student has the possibility to arrange similar academic mobility in other parts of the programme.

6.2 Nordic Double Degree in Didactics of Mathematics (1st year at UCPH)
The specialisation is set at 120 ECTS and consists of the following:
- Compulsory subject elements, 52.5 ECTS.
- Restricted elective subject elements, 37.5 ECTS.
- Thesis, 30 ECTS.

6.2.1 Compulsory subject elements
All of the following subject elements at University of Copenhagen are to be covered (22.5 ECTS):

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Course Title</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAK15005U</td>
<td>Advanced Vector Spaces</td>
<td>AdVec</td>
<td>7.5</td>
</tr>
<tr>
<td>NFKA09006U</td>
<td>Advanced Didactics of Mathematics</td>
<td>DidMatV</td>
<td>7.5</td>
</tr>
<tr>
<td>NNDK15003U</td>
<td>Project on Didactics of Mathematics</td>
<td>ProjDidMat</td>
<td>7.5</td>
</tr>
</tbody>
</table>

All of the following subject elements at the University of Agder University are to be covered (30 ECTS):

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Course Title</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ma-421</td>
<td>The Digital Tools in Mathematics Teaching</td>
<td>Autumn</td>
<td>7.5</td>
</tr>
<tr>
<td>Ma-424</td>
<td>Working Methods in Mathematics</td>
<td>Autumn</td>
<td>15</td>
</tr>
<tr>
<td>Ma-427</td>
<td>The Nature of Mathematics</td>
<td>Autumn</td>
<td>7.5</td>
</tr>
</tbody>
</table>

6.2.2 Restricted elective subject elements
37.5 ECTS are to be covered as subject elements from the following two lists:

1) 15 ECTS are to be covered as subject elements from the following list:

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Course Title</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAA05014U</td>
<td>Algebra 3</td>
<td>Alg3</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05038U</td>
<td>Algebraic Topology</td>
<td>AlgTop</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK11003U</td>
<td>Advanced Probability Theory1</td>
<td>VidSand1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK10008U</td>
<td>Functional Analysis</td>
<td>FunkAn</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA06062U</td>
<td>Geometry 2</td>
<td>Geom2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK15016U</td>
<td>History of Mathematics 2</td>
<td>Hist2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK11011U</td>
<td>Advanced Probability Theory 2</td>
<td>VidSand2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05100U</td>
<td>Homological Algebra</td>
<td>HomAlg</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK10019U</td>
<td>Differential operators and function spaces</td>
<td>DifFun</td>
<td>7.5</td>
</tr>
</tbody>
</table>

2) 22.5 ECTS are to be covered as further subject elements from the above list and by subject elements from the following list:

<table>
<thead>
<tr>
<th>Subject ID</th>
<th>Course Title</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAK14005U</td>
<td>Algebraic Geometry</td>
<td>AlgGeo</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA06020U</td>
<td>Categories and Topology</td>
<td>CatTop</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK16022U</td>
<td>Partial Differential Equations</td>
<td>PDE</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK16001U</td>
<td>Analytic Number Theory*</td>
<td>AnNum</td>
<td>7.5</td>
</tr>
</tbody>
</table>
Preliminary approval has been granted for the subject elements done at University of Agder to be included in the MSc programme in Mathematics, and students who want to do the subject element therefore do not have to apply for preliminary approval from the Study Board of Mathematics and Computer Science.

### 6.2.3 Thesis
The MSc Programme in Mathematics with a specialisation in Nordic Double Degree in Didactics of Mathematics (1st year at UCPH) includes a thesis corresponding to 30 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

### 6.2.4 Academic Mobility
The academic mobility is covered by the stay at Agder University.

### 6.3 Nordic Double Degree in Didactics of Mathematics (1st year at Agder)
The specialisation is set at 120 ECTS and consists of the following:
- Compulsory subject elements, 75 ECTS.
- Restricted elective subject elements, 15 ECTS.
- Thesis, 30 ECTS.

#### 6.3.1 Compulsory subject elements
All of the following subject elements at University of Copenhagen are to be covered (15 ECTS):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Subject</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAK15005U</td>
<td>Advanced Vector Spaces</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>NFKA09006U</td>
<td>Advanced Didactics of Mathematics</td>
<td>Block 1</td>
<td>7.5 ECTS</td>
</tr>
</tbody>
</table>

All of the following subject elements at the University of Agder University are to be covered (60 ECTS):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Subject</th>
<th>Semester</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ma-428</td>
<td>Abstract Algebra</td>
<td>Autumn</td>
<td>7.5 ECTS</td>
</tr>
<tr>
<td>Ma-424</td>
<td>Working Methods in Mathematics</td>
<td>Autumn</td>
<td>15 ECTS</td>
</tr>
<tr>
<td>Ma-427</td>
<td>The nature of Mathematics</td>
<td>Autumn</td>
<td>7.5 ECTS</td>
</tr>
</tbody>
</table>
6.3.2 Restricted elective subject elements

15 ECTS are to be covered as subject elements from the following list:

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAA05014U</td>
<td>Algebra 3</td>
<td>Alg3</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05038U</td>
<td>Algebraic Topology</td>
<td>AlgTop</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK11003U</td>
<td>Advanced Probability Theory 1</td>
<td>VidSand1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK10008U</td>
<td>Functional Analysis</td>
<td>FunkAn</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA06062U</td>
<td>Geometry 2</td>
<td>Geom2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK14032U</td>
<td>History of Mathematics 2</td>
<td>Hist2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK11011U</td>
<td>Advanced Probability Theory 2</td>
<td>VidSand2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05100U</td>
<td>Homological Algebra</td>
<td>HomAlg</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK10019U</td>
<td>Differential Operators and Function Spaces</td>
<td>DifFun</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Preliminary approval has been granted for the subject elements done at University of Agder to be included in the MSc programme in Mathematics, and therefore, students who do the courses do not have to apply for preliminary approval from the Study Board of Mathematics and Computer Science.

6.3.3 Thesis

The MSc Programme in Mathematics with a specialisation in Nordic Double Degree in Didactics of Mathematics (1st year at Agder) includes a thesis corresponding to 30 ECTS, as described in Appendix 2 to the shared curriculum. The thesis must be written within the academic scope of the programme.

6.3.4 Academic Mobility

The academic mobility is covered by the stay at Agder University.

7 Exemptions

In exceptional circumstances, the study board may grant exemptions from the rules in the curriculum specified solely by the Faculty of Science.

8 Commencement etc.

8.1 Validity

This subject specific section of the curriculum applies to all students enrolled on the programme – see however Appendix 2.

8.2 Transfer

Students enrolled on previous curricula may be transferred to the new one as per the applicable transfer regulations or according to an individual credit transfer by the study board.

8.3 Amendments

The curriculum may be amended once a year so that any changes come into effect at the beginning of the academic year. Amendments must be proposed by the study board and approved by the Dean.

Notification about amendments that tighten the admission requirements for the programme will be published online at www.science.ku.dk one year before they come into effect. If amendments are made to this curriculum, an interim arrangement may be added if necessary to allow students to complete their MSc Programme according to the amended curriculum.
Appendix 1 Tables

Tables for students admitted to the programme in September (summer):

Table – General profile in Mathematics

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Advanced Vector Spaces</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td>2nd year</td>
<td>Elective</td>
<td>Elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table illustrates the recommended academic progression. The student is allowed to plan an alternative progression within the applicable rules.

Table – Nordic double degree in didactics of mathematics (1st year at UCPH)

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Advanced Vector Spaces</td>
<td>Restricted elective</td>
<td>Project on Didactics of Mathematics</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Advanced Didactics of Mathematics</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted Elective</td>
</tr>
<tr>
<td>2nd year</td>
<td>Agder University</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table illustrates the recommended academic progression. The student is allowed to plan an alternative progression at UCPH within the applicable rules.

The 2nd year in the table is left partially blank, as the 2nd year is to be spent at the University of Agder, where the subject elements do not conform to the block structure of the University of Copenhagen.

Table – Nordic double degree in didactics of mathematics (1st year at Agder)

<table>
<thead>
<tr>
<th></th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
<th>Block 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Adger University</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>Advanced Vector Spaces</td>
<td>Restricted Elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Advanced Didactics of Mathematics</td>
<td>Restricted Elective</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table illustrates the recommended academic progression. The student is allowed to plan an alternative progression at UCPH within the applicable rules.

The 1st year in the table is left partially blank, as the 1st year is to be spent at the University of Agder, where the subject elements do not conform to the block structure of the University of Copenhagen.
Tables for students admitted to the programme in February (winter):

Table – General profile in Mathematics*

<table>
<thead>
<tr>
<th></th>
<th>Block 3</th>
<th>Block 4</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Advanced Vector Spaces</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td>2nd year</td>
<td>Elective</td>
<td>Elective</td>
<td>Thesis</td>
<td>Thesis</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td>Elective</td>
<td>Thesis</td>
<td>Thesis</td>
</tr>
</tbody>
</table>

*This table is only relevant for students who begin the MSc Programme in February (block 3)

The table illustrates the recommended academic progression. The student is allowed to plan an alternative progression within the applicable rules.
Appendix 2 Interim arrangements

The Shared Section of the BSc and MSc Curricula for Study Programmes applies to all students.

The interim arrangements below only consist of parts where the current curriculum differs from the rules and regulations that were previously valid. Therefore, if information about relevant rules and regulations are missing, it can be found in the curriculum above.

1 General changes valid for students admitted in the academic year 2016/17

Students admitted to the MSc Programme in the academic year 2016/17 must finish the programme as listed in the curriculum above with the following exceptions.

1.1 General profile in Mathematics

Structure of the programme

The required amount of restricted elective subject elements has been reduced from 67.5 to 52.5 ECTS, and correspondingly, the amount of elective subject elements has been increased from 15 to 30 ECTS.

Restricted elective subject elements

52.5 ECTS are to be covered as restricted subject elements from the following lists:

1) 22.5 ECTS are to be covered as restricted subject elements from the following list:

- Restricted elective subject elements offered as part of the specialisation General Profile in Mathematics (in list 1) in this curriculum (see above)

2) 30 ECTS are to be covered as further restricted subject elements from the list above and by restricted subject elements from the following list:

- Restricted elective subject elements offered as part of the specialisation General Profile in Mathematics (in list 2) in this curriculum (see above)
- NMAK16012U Gödels Constructive Universe of Sets Discontinued* 7.5 ECTS
- NMAK16011U Groups and C*-Algebras Discontinued* 7.5 ECTS

* See course specific changes below.

1.2 Nordic Double Degree in Didactics of Mathematics 1st year in CPH

Restricted elective subject elements

37.5 ECTS are to be covered as subject elements from the following two lists:

1) 15 ECTS are to be covered as subject elements from the following list:

- Restricted elective subject elements offered as part of the specialisation Nordic Double Degree in Didactics of Mathematics (1st year at UCPH) (in the list 1) in this curriculum (see above)

2) 22.5 ECTS are to be covered as further subject elements from the above list 1) in the curriculum and by subject elements from the following list:

- Restricted elective subject elements offered as part of the specialisation Nordic Double Degree in Didactics of Mathematics (1st year at UCPH) (in the list 2) in this curriculum (see above)
- NMAK16012U Gödels Constructive Universe of Sets Discontinued* 7.5 ECTS
- NMAK16011U Groups and C*-Algebras Discontinued* 7.5 ECTS

* See course specific changes below.

2 General changes valid for students admitted in the academic year 2015/16

Students admitted to the MSc Programme in the academic year 2015/16 must finish the programme as listed in the curriculum above with the following exceptions.

Page 12 of 19
2.1 General profile in Mathematics

Structure of the programme

The required amount of restricted elective subject elements has been reduced from 67.5 to 52.5 ECTS, and correspondingly, the amount of elective subject elements has been increased from 15 to 30 ECTS.

Restricted elective subject elements

52.5 ECTS are to be covered as restricted subject elements from the following lists:

1) 22.5 ECTS are to be covered as restricted subject elements from the following list:

- Restricted elective subject elements offered as part of the specialisation General Profile in Mathematics (in list 1) in this curriculum (see above)

2) 30 ECTS are to be covered as restricted subject elements from the following list:

- Restricted elective subject elements offered as part of the specialisation General Profile in Mathematics (in list 2) in this curriculum (see above)

* See course specific changes below.

2.2 Nordic Double Degree in Didactics of Mathematics 1st year in CPH

Restricted elective subject elements

37.5 ECTS are to be covered as subject elements from the following two lists:

1) 15 ECTS are to be covered as subject elements from the following list:

- Restricted elective subject elements offered as part of the specialisation Nordic Double Degree in Didactics of Mathematics (1st year at UCPH) (in the list 1) in this curriculum (see above)

2) 22.5 ECTS are to be covered as further subject elements from the above list and by subject elements from the following list:

- Restricted elective subject elements offered as part of the specialisation Nordic Double Degree in Didactics of Mathematics (1st year at UCPH) (in the list 2) in this curriculum (see above)
3 General changes valid for students admitted in the academic year 2014/15 or earlier
Students admitted to the MSc Programme in the academic year 2014/15 or earlier must finish the programme as listed in the curriculum above with the following exceptions.

3.1 General profile in Mathematics
The specialisation is continued in the present curricula but has been changed in the composition of the compulsory, restricted elective and elective subject elements.

Structure of the programme
The specialisation is set at 120 ECTS and consists of the following:
- Restricted elective subject elements, 60 ECTS.
- Elective subject elements, 30 ECTS.
- Thesis, 30 ECTS.

Restricted elective subject elements
60 ECTS are to be covered as subject elements from one or both of the following lists:

1) At least 30 ECTS are to be covered by subject elements from the following list:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAA05014U</td>
<td>Algebra 3 (Alg3)</td>
<td>Block 1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05038U</td>
<td>Algebraic Topology (AlgTop)</td>
<td>Block 1</td>
<td>7.5</td>
</tr>
<tr>
<td>NFKA09006U</td>
<td>Advanced Didactics of Mathematics (DidMatV)</td>
<td>Block 1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK11003U</td>
<td>Advanced Probability Theory 1 (VidSand1)</td>
<td>Block 1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK15016U</td>
<td>History of Mathematics 2 (Hist2)</td>
<td>Block 2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK10008U</td>
<td>Functional Analysis (FunkAn)</td>
<td>Block 2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05100U</td>
<td>Homological algebra (HomAlg)</td>
<td>Block 2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK11011U</td>
<td>Advanced Probability Theory 2 (VidSand2)</td>
<td>Block 2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA06062U</td>
<td>Geometry 2 (Geom2)</td>
<td>Block 2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK10019U</td>
<td>Differential operators and function spaces (DiffFun)</td>
<td>Block 3</td>
<td>7.5</td>
</tr>
</tbody>
</table>

2) Up to 30 ECTS are to be covered as subject elements from the following list:

<table>
<thead>
<tr>
<th>Subject Elements</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses held by Department of Mathematics at the Faculty of SCIENCE on MSc level</td>
<td>Up to 30 ECTS</td>
</tr>
<tr>
<td>Projects outside the course scope with the principal supervisor from the Department of Mathematical Science</td>
<td>Up to 15 ECTS</td>
</tr>
</tbody>
</table>

Competence profile
On completion of the programme, an MSc in Mathematics with a general profile in mathematics enrolled in 2014/2015 or earlier has acquired the following:

Knowledge about:
- Selected research-active fields within mathematics.

Skills in/to:
- Read and understand mathematical original literature.
- Communicate mathematical issues on a scientific basis.
- Account orally and in writing for mathematical inquiries into open problems.
Competences in/to:
- Conduct independent, stringent argumentation.
- Structure a study of open mathematical questions and divide it into smaller easily accessible challenges.
- Delimit mathematical disciplines in relation to each other, but also use techniques across disciplines.
- Independently take responsibility for his or her own professional development and specialisation.
- Scientifically reflect on methods for analysing and resolving mathematical questions.

3.2 Nordic Double Degree in Didactics of Mathematics 1st year in CPH
The specialisation are continued in the present curricula but have been changed in the composition of the compulsory, restricted elective and elective subject elements.

Structure of the programme
The specialisation is set at 120 ECTS and consists of the following:
- Compulsory subject elements, 35 ECTS.
- Restricted elective subject elements, 55 ECTS.
- Thesis, 30 ECTS.

Compulsory subject elements
Students that begin studies the first year in Copenhagen must pass:

- **NFKA09006U** Advanced Didactics of Mathematics (DidMatV) Block 1 7.5 ECTS
- **NFKA09005U** Project on Didactics of Mathematics Discontinued* 7.5 ECTS

Restricted elective subject elements
45 ECTS are to be covered by subject elements from the following two lists:

1) 22.5 ECTS are to be covered by subject elements from the following list:

- Optional subject elements in pure mathematics/history of mathematics 22.5 ECTS

2) 22.5 ECTS are to be covered by subject elements from the following list:

- **NMAA05014U** Algebra 3 (Alg3) Block 1 7.5 ECTS
- **NMAK11003U** Advanced Probability Theory 1 (VidSand1) Block 1 7.5 ECTS
- **NMAA05038U** Algebraic Topology (AlgTop) Block 1 7.5 ECTS
- **NMAK15016U** History of Mathematics 2 (Hist2) Block 2 7.5 ECTS
- **NMAA06062U** Geometry 2 (Geom2) Block 2 7.5 ECTS
- **NMAK10008U** Functional Analysis (FunkAn) Block 2 7.5 ECTS
- **NMAA05100U** Homological algebra (HomAlg) Block 2 7.5 ECTS
- **NMAK11111U** Advanced Probability Theory 2 (VidSand2) Block 2 7.5 ECTS
- **NMAK10019U** Differential Operators and Function Spaces (DifFun) Block 3 7.5 ECTS
- Courses outside the course scope with the principal supervisor from the Department of Mathematical Science Up to 15 ECTS

Courses on Agder University
On the second year at the University of Agder students enrolled in 2014/2015 or earlier must pass 20 ECTS compulsory subject elements, 10 ECTS restricted elective subject elements and their thesis at 30 ECTS-credits.

3.3 Nordic Double Degree in Didactics of Mathematics 1st year in Agder
The specialisation are continued in the present curricula but have been changed in the composition of the compulsory, restricted elective and elective subject elements.
Structure of the programme
The specialisation is set at 120 ECTS and consists of the following:
- Compulsory subject elements, 57.5 ECTS.
- Restricted elective subject elements, 32.5 ECTS.

Compulsory subject elements
On the second year at the University of Copenhagen students that begin studies the first year in Agder must pass:

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFKA09006U</td>
<td>Advanced Didactics of Mathematics (DidMatV)</td>
<td>1</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Restricted elective courses
22.5 ECTS are to be covered by subject elements from the following list:

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Block</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAA05014U</td>
<td>Algebra 3 (Alg3)</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK11003U</td>
<td>Advanced Probability Theory 1 (VidSand1)</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05038U</td>
<td>Algebraic Topology (AlgTop)</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK15016U</td>
<td>History of Mathematics 2 (Hist2)</td>
<td>2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA06062U</td>
<td>Geometry 2 (Geom2)</td>
<td>2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK10008U</td>
<td>Functional Analysis (FunkAn)</td>
<td>2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05100U</td>
<td>Homological algebra (HomAlg)</td>
<td>2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK11011U</td>
<td>Advanced Probability Theory 2 (VidSand2)</td>
<td>2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK10019U</td>
<td>Differential operators and function spaces (DifFun)</td>
<td>3</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Courses on Agder University
On the first year at the University of Agder students enrolled in 2014/2015 or earlier must pass 50 ECTS compulsory subject elements and 10 ECTS restricted elective subject elements.

Competence profile
On completion of the programme, an MSc in Mathematics with a Nordic double degree in didactics of mathematics enrolled in 2014/2015 or earlier has acquired the following:

Knowledge about:
- Selected research-active fields of mathematics, including didactics of mathematics.

Skills in/to:
- Read and understand mathematical original literature.
- Communicate mathematical and especially mathematical-didactic issues on a scientific basis.
- Account orally and in writing for mathematical inquiries into open problems.
- Account orally and in writing for empirical as well as approaches to studies of mathematical-didactic aspects of a particular case.

Competences in/to:
- Conduct independent, stringent argumentation.
- Structure a study of open mathematical and mathematical-didactic questions and divide it into smaller easily accessible challenges.
- Delimit mathematical disciplines in relation to each other, but also use techniques across disciplines.
- Independently take responsibility for his or hers own professional development and specialisation.
- Scientifically reflect on methods for analysing and resolving mathematical and mathematical-didactic questions.
<table>
<thead>
<tr>
<th>Discontinued courses</th>
<th>Interim agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebraic Number Theory (AlgNT) (NMAK15006U), 7.5 ECTS.</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
</tr>
<tr>
<td>Automorphic Forms and Fuchsian Groups (FuchsGr) (NMAK15007U), 7.5 ECTS.</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
</tr>
<tr>
<td>C<em>Topics: K-theory for C</em>-algebras (NMAK15008U), 7.5 ECTS.</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
</tr>
<tr>
<td>Complex analysis 2 (NMAK15009U), 7.5 ECTS.</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
</tr>
<tr>
<td>Descriptive Set Theory (DesSet) (NMAK14011U), 7.5 ECTS.</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
</tr>
<tr>
<td>Graph Coloring (NMAK15015U), 7.5 ECTS.</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
</tr>
<tr>
<td>Groups and C*-Algebras (NMAK16011U), 7.5 ECTS</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2016/17 and 2015/16.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2016/17 and a third exam is offered in the academic year 2017/18.</td>
</tr>
<tr>
<td>Gödels Constructive Universe of Sets (NMAK16012U), 7.5 ECTS</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2016/17 and 2015/16.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2016/17 and a third exam is offered in the academic year 2017/18.</td>
</tr>
<tr>
<td>Heights and Diophantine Problems (NMAK14034U), 7.5 ECTS</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
</tbody>
</table>

Page 17 of 19
<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of Mathematics 2: The Classical Problem (Hist2) (NMAK14032U), 7.5 ECTS.</td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
<td>The course was a restricted elective course on “Nordic Double Degree in Didactics of Mathematics (1st year at Agder)” in the academic year 2014/15 or earlier. The course has changed title and is equivalent to History of Mathematics 2 (Hist2) (NMAK15016U), 7.5 ECTS.</td>
</tr>
<tr>
<td>Optimization and Convexity (OK) (NMAK10012U), 7.5 ECTS.</td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
<tr>
<td>Project on Didactics of Mathematics, 7.5 ECTS</td>
<td>The course was a compulsory course on the “Nordic Double Degree in Didactics of Mathematics (1st year at CPH)” in the academic year 2014/15 or earlier.</td>
<td>The course is equivalent with Project on Didactics of Mathematics (NNDK15003U), 7.5 ECTS.</td>
</tr>
<tr>
<td>Representation Theory (RepTh) (NMAK14021U), 7.5 ECTS.</td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
<tr>
<td>Transcendental Numbers (NMAK14027U), 7.5 ECTS.</td>
<td>The course was offered for the last time in the academic year 2014/15 and a third exam is offered in the academic year 2015/16.</td>
<td>The course was a restricted elective course on “General Profile in Mathematics” and “Nordic Double Degree in Didactics of Mathematics (1st year in CPH)” in the academic year 2015/16 or earlier.</td>
</tr>
<tr>
<td>Course package at Agder: Concepts in Analysis 2, 10 ECTS Algebra 2, 10 ECTS Modelling and diff. eq. 2, 10 ECTS Working methods in math., 10 ECTS Learning and teaching meth, 10 ECTS Restricted elective course or project in Didactics of mathematics, 10 ECTS</td>
<td></td>
<td>The course package at Agder: Ma-428, Abstract Algebra, 7.5 ECTS Ma-424, Working Methods in Mathematics, 15 ECTS Ma-427, The nature of Mathematics, 7.5 ECTS Ma-422, Research on learning and teaching of mathematics, 15 ECTS Ma-431, Topics in Modern Analysis - spring - 15 ECTS</td>
</tr>
<tr>
<td>Course package at Agder: Modern technology in math., 5 ECTS Research methods in math, 5 ECTS Working methods in math., 10 ECTS One of the following: Modelling and diff. eq. 2, 10 ECTS Development of maths., 10 ECTS</td>
<td></td>
<td>The course package at Agder: Ma-421, The digital tools in mathematics, teaching, 7.5 ECTS Ma-424, Working Methods in Mathematics, 15 ECTS Ma-427, The nature of Mathematics, 7.5 ECTS</td>
</tr>
</tbody>
</table>
Appendix 3 Description of objectives for the thesis

After completing the thesis, the student should have:

Knowledge about:
- Scientific problems within the study programme’s subject areas.
- A suitable combination of methodologies/theories based on international research for use in his/her work with the problem formulation.
- Theories/models on the basis of an organised value system and with a high degree of independence.

Skills in/to:
- Apply and critically evaluate theories/methodologies, including their applicability and limitations.
- Assess the extent to which the production and interpretation of findings/material depend on the theory/methodology chosen and the delimitation chosen.
- Discuss academic issues arising from the thesis.
- Draw conclusions in a clear and academic manner in relation to the problem formulation and, more generally, considering the topic and the subject area.
- Discuss and communicate the academic and social significance, if any, of the thesis based on ethical principles.

Competences in/to:
- Initiate and perform academic work in a research context.
- Solve complex problems and carry out development assignments in a work context.