Programme-specific Section of the Curriculum for the MSc Programme in Actuarial Mathematics at the Faculty of Science, University of Copenhagen 2010 (Rev. 2016)

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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 Actuarial Mathematics leads to a Master of Science (MSc) in Actuarial Mathematics with the Danish title: Cand.act. (candidatus/candidata actuariae).

1.2 Affiliation
The programme is affiliated with the Study Board for 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 Actuarial Mathematics is a research-based programme, the objective of which is to provide the student with the mathematical knowledge and insights required to work independently and in a professionally sound manner within the insurance profession and contribute to the further development of this theoretical field.

2.2 General programme profile
The programme provides a general introduction to both life and non-life insurance mathematics. The student can subsequently specialise in one of these disciplines or in fields such as stochastic processes, risk management, financial theory and statistical analysis.

Actuarial mathematics, probability theory, finance, statistics and computer science are the key subject areas of the programme.

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

There are no defined specialisations in this programme.

2.4 Career opportunities
The MSc Programme in Actuarial Mathematics qualifies students for a PhD programme, and depending on the academic specialisation it may also be targeted at business functions and/or areas such as:
- Actuarial functions in insurance companies.
- Regulative authorities.
- Specialized software development.
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 Competence profile
On completion of the programme, an MSc in Actuarial Mathematics has acquired the following:

Knowledge about:
- General theory for stochastic processes, including various special classes of processes: Martingales, Counting Processes, Renewal Processes, Stochastic Integrals and more.
- Stochastic differential equations with applications to finance.
- Risk measures and extreme value theory.
- Ruin theory, in particular the Cramér-Lundberg model.
- Credit modelling and operational risk modelling.
- Claim reservation.
- Term structure theory and market reserves.
- Parametric and non-parametric statistical models for insurance applications.
- Selected research-active fields with life and non-life insurance mathematics.

Skills in/to:
- Read and understand actuarial mathematical and statistical original literature.
- Communicate actuarial mathematical issues on a scientific basis.
- Account orally and in writing for inquiries into open actuarial mathematical issues.
- Derive and solve differential equations describing actuarial problems.
- Determine arbitrage free prices for financial claims.
- Compute ruin probabilities and value-at-risk.
- Analyse statistical models for insurance applications.

Competences in/to:
- Structure an inquiry into open actuarial mathematical issues, regarding both life and non-life insurance mathematics and divide it into smaller easily accessible challenges.
- Further develop and adapt probabilistic and statistical models for real-life challenges.
- Conduct independent, stringent argumentation.
- Independently take responsibility for his or her own professional development and specialisation.
- Reflect on methodologies for analysing and solving actuarial mathematical issues at a scientific level.

4 Admission requirements
With a Bachelor’s degree in Actuarial Mathematics from the University of Copenhagen the student is granted reserved access and guaranteed a place on the MSc Programme in Actuarial 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 Actuarial Mathematics
Applicants with a Bachelor’s degree in Actuarial Mathematics from the University of Copenhagen, other Danish or Nordic universities are directly academically qualified for admission to the MSc Programme.
4.2 Applicants with a closely related Bachelor’s degree
Applicants with a Bachelor’s degree in Mathematics-Economics or Mathematics from the University of Copenhagen or other Danish or international universities may also be admitted if their programme includes the following:

- Subject elements in life insurance mathematics (at least 7.5 ECTS).
- Subject elements in non-life insurance mathematics (at least 7.5 ECTS).
- Subject elements in statistics on a measure-theoretical basis (at least 15 ECTS).

4.3 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 elements:

- Subject elements in mathematical analysis, including measure theory at least 22.5 ECTS credits
- Subject elements in linear algebra at least 7.5 ECTS credits
- Subject elements in life insurance mathematics at least 7.5 ECTS credits
- Subject elements in non-life insurance mathematics at least 7.5 ECTS credits
- Subject elements in statistics on a measure-theoretical basis at least 15 ECTS credits

4.4 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 4.1-3.

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

Applicants are then prioritised according to their total numbers of ECTS credits within the relevant academic fields 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).
6.1 Programme components
The programme is set at 120 ECTS credits and consists of the following:
- Compulsory subject elements, 60 ECTS credits.
- Restricted elective subject elements, 15 ECTS credits.
- Elective subject elements, 15 ECTS credits.
- Thesis, 30 ECTS credits.

6.1.1 Compulsory subject elements
All of the following subject elements are to be covered (60 ECTS credits):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Block</th>
<th>ECTS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAK11003U</td>
<td>Advanced Probability Theory 1 (VidSand1)</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05115U</td>
<td>Stochastic Processes in Life Insurance (LivStok)</td>
<td>1</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>NMAA05113U</td>
<td>Continuous Time Finance (FinKont)</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA06068U</td>
<td>Topics in Life Insurance (Liv2)</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA06068U</td>
<td>Topics in Non-Life Insurance (Skade2)</td>
<td>4</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAA05117U</td>
<td>Stochastic Processes in Non-Life Insurance (SkadeStok)</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK10020U</td>
<td>Quantitative Risk Management (QRM)</td>
<td>2</td>
<td>7.5</td>
</tr>
</tbody>
</table>

6.1.2 Restricted elective subject elements
15 ECTS credits are to be covered as subject elements from the following list:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Block</th>
<th>ECTS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAK16017U</td>
<td>Statistical inference for Markov processes</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK16004U</td>
<td>Computational Finance (AAM)</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK13005U</td>
<td>Introduction to Extreme Value Theory (IntroExtremValue)</td>
<td>1</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK16014U</td>
<td>Introduction to Multivariate Extreme Value Theory (AAM)</td>
<td>2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK16015U</td>
<td>Optimal stopping with applications</td>
<td>2</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK14013U</td>
<td>Modelling dependence in discrete time (AAM)</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>NMAK16006U</td>
<td>Consumption-Investment-Insurance problems</td>
<td>4</td>
<td>7.5</td>
</tr>
</tbody>
</table>

6.1.3 Elective subject elements
15 ECTS credits are to be covered as elective subject elements.

BSc subject elements corresponding to 15 ECTS credits 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 credits. 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 up to 15 ECTS credits. The regulations are described in Appendix 4 to the shared section of the curriculum.

6.1.4 Thesis
The MSc Programme in Actuarial Mathematics includes a thesis corresponding to 30 ECTS credits, 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
Academic mobility requires that the student follows the rules and regulations regarding pre-approval and credit transfer.
The academic mobility in the MSc Programme in Actuarial Mathematics is placed in block 1+2 of the 2nd year. This means that the curriculum makes it possible to follow subject elements outside the Faculty of Science.

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

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 in 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 enter into force on the start 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 – MSc Programme in Actuarial 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 Probability Theory 1</td>
<td>Advanced Probability Theory 2</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td></td>
<td>Stochastic processes in life insurance</td>
<td>Continuous Time Finance</td>
<td>Topics in Life Insurance</td>
<td>Topics in non-life insurance</td>
</tr>
<tr>
<td>2nd year</td>
<td>Stochastic processes in non-life insurance</td>
<td>Quantitative risk management</td>
<td></td>
<td>Thesis</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td>Elective</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Table for students admitted to the programme in February (winter):

Table – MSc Programme in Actuarial 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>Elective</td>
<td>Elective</td>
<td>Advanced Probability Theory 1</td>
<td>Advanced Probability Theory 2</td>
</tr>
<tr>
<td></td>
<td>Restricted elective</td>
<td>Topics in non-life insurance</td>
<td>Stochastic Processes in Life Insurance</td>
<td>Continuous Time Finance 2</td>
</tr>
<tr>
<td>2nd year</td>
<td>Topics in life insurance</td>
<td>Restricted elective</td>
<td>Stochastic Processes in Non-Life Insurance</td>
<td>Quantitative risk management</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Thesis</td>
</tr>
</tbody>
</table>

*This table is only relevant for students who begin the MSc Programme in February (block 3).
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 for students admitted in the academic year 2017/18 or earlier
Students admitted to the MSc Programme in the academic year 2017/18 or earlier must finish the programme with the original curriculum structure under which they were admitted.

1.1 If Stochastic Processes 2 and/or Stochastic Processes 3 is passed as part of the BSc Programme
From the academic year 2015/16 the courses Stochastic Processes 2 and Stochastic Processes 3 has been added as compulsory subject elements to the BSc Programme in Actuarial Mathematics (forsikringsmatematik). Stochastic Processes 2 and Stochastic Processes 3 are equivalent with the two compulsory subject elements Advanced Probability Theory 1 and Advanced Probability Theory 2 on the MSc Programme in Actuarial Mathematics.

From the academic year 2018/19 Advanced Probability Theory 1 and Advanced Probability Theory 2 will be removed from the MSc Programme in Actuarial Mathematics and replaced by restricted elective subject elements.

Structure of the programme
The programme is set at 120 ECTS credits and consists of the following:

- Compulsory subject elements,
  - 45 ECTS credits (if both Stochastic Processes 2 and Stochastic Processes 3 is passed)
  - 22.5 ECTS credits (if Stochastic Processes 2 or Stochastic Processes 3 is passed)
- Restricted elective subject elements,
  - 30 ECTS credits (if both Stochastic Processes 2 and Stochastic Processes 3 is passed)
  - 52.5 ECTS credits (if Stochastic Processes 2 or Stochastic Processes 3 is passed)
- Elective subject elements, 15 ECTS credits.
- Thesis, 30 ECTS credits.

Table – MSc Programme in Actuarial Mathematics (if both are passed)

<table>
<thead>
<tr>
<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></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td>Stochastic processes in</td>
<td>Continuous Time Finance</td>
<td>Topics in Life Insurance</td>
<td>Topics in non-life</td>
</tr>
<tr>
<td>life insurance</td>
<td></td>
<td></td>
<td>insurance</td>
</tr>
<tr>
<td>2nd year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stochastic processes in</td>
<td>Quantitative risk</td>
<td></td>
<td>Thesis</td>
</tr>
<tr>
<td>non-life insurance</td>
<td>management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>Elective</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compulsory | Restricted elective | Elective
### Table – MSc Programme in Actuarial Mathematics (Stochastic Processes 2 is passed)

<table>
<thead>
<tr>
<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></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restricted elective</td>
<td>Advanced Probability Theory 2</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td>Stochastic processes in life insurance</td>
<td>Continuous Time Finance</td>
<td>Topics in Life Insurance</td>
<td>Topics in non-life insurance</td>
</tr>
<tr>
<td>2nd year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stochastic processes in non-life insurance</td>
<td>Quantitative risk management</td>
<td>Elective</td>
<td>Thesis</td>
</tr>
</tbody>
</table>

### Table – MSc Programme in Actuarial Mathematics (Stochastic Processes 3 is passed)

<table>
<thead>
<tr>
<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></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Probability Theory 1</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
<td>Restricted elective</td>
</tr>
<tr>
<td>Stochastic processes in life insurance</td>
<td>Continuous Time Finance</td>
<td>Topics in Life Insurance</td>
<td>Topics in non-life insurance</td>
</tr>
<tr>
<td>2nd year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stochastic processes in non-life insurance</td>
<td>Quantitative risk management</td>
<td>Elective</td>
<td>Thesis</td>
</tr>
</tbody>
</table>

**2 General changes for students admitted in the academic year 2015/16 or earlier**
Students admitted to the MSc Programme in the academic year 2015/16 or earlier must finish the programme with the original curriculum structure under which they were admitted.

**Restricted elective subject elements**
- Restricted elective subject elements offered in this curriculum (see above)
- NMAK15011U Control Theory in Finance Discontinued* 7.5 ECTS credits
- NMAK15019U Phase-type distributions: Theory and applications Discontinued* 7.5 ECTS credits
- NMAK15024U Topics in Financial Risk Management Discontinued* 7.5 ECTS credits
- NMAK15018U Modelling Dependence in Non-Life Insurance Discontinued* 7.5 ECTS credits
- NMAK14022U Statistics for non-linear time series models Discontinued* 7.5 ECTS credits

* See course specific changes below.

**3 General changes for students admitted in the academic year 2014/2015 or earlier**
Students admitted to the MSc Programme in the academic year 2014/15 or earlier must finish the programme with the original curriculum structure under which they were admitted.

**Restricted elective subject elements**
15 ECTS credits may be covered by subject elements from the following list:
- Restricted elective subject elements offered in this curriculum (see above)
- Subject elements that have the abbreviation “AAM” (advanced actuarial mathematics)
- Projects outside the course scope with the principal supervisor from the Department of Mathematical Sciences
Thesis
The thesis may either be carried out as a full-time project at the end of the study programme or concurrently with other subject elements. However, the thesis must conclude the programme.

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

Knowledge about:
- Selected research-active fields within life and non-life insurance mathematics.

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

Competences in/to:
- Structure an inquiry into open actuarial mathematical issues, regarding both life and non-life insurance mathematics and divide it into smaller easily accessible challenges. Further develop and adapt probabilistic and statistical models for real-life challenges.
- Conduct independent, stringent argumentation.
- Independently take responsibility for his or her own professional development and specialisation.
- Reflect on methodologies for analysing and solving actuarial mathematical issues at a scientific level.

4 Course specific changes

<table>
<thead>
<tr>
<th>Discontinued course</th>
<th>Interim arrangement</th>
</tr>
</thead>
</table>
| AAM courses:                                                                        | For students admitted in the academic year 2014/2015 or earlier the restricted elective subject elements are designated by the abbreviation ’AAM’ (Advanced Actuarial Mathematics). These restricted elective subject elements have previously been designated by the following parenthesis after the course title: ‘(Topics in insurance mathematics)’.
<p>| • A300: Emner I large divations (NMAA09033U)                                       |--------------------------------------------------------------------------------------|
| • AS200: Ekstremværde (NMAA09013U)                                                 |--------------------------------------------------------------------------------------|
| • Statistiske metoder i forsinkringsmatematik (NMAK10029U)                         |--------------------------------------------------------------------------------------|
| • Monte Carlo Methods in Insurance Finance (NMAA06013U)                            |--------------------------------------------------------------------------------------|
| • Levy processer i finansiering (NMAA07010U)                                      |--------------------------------------------------------------------------------------|
| • Forbruges- og protefølgevalgsproblemer i finans og forsinkring (NMAK11018U)     |--------------------------------------------------------------------------------------|
| • Statistiske metoder i skadeforsikring (NMAK11023U)                              |--------------------------------------------------------------------------------------|
| • Mathematical Demography (NMAK11026U)                                             |--------------------------------------------------------------------------------------|
| • Asset-liabilitymanagement for pensionskasser (NMAA09010U)                       |--------------------------------------------------------------------------------------|
| • Stokastisk analyse med anvendelser i forsinkring og/eller i finans (NMAK10032U) |--------------------------------------------------------------------------------------|
| • Topics in Life Insurance Mathematics (NMAK13021U)                                |--------------------------------------------------------------------------------------|
| • Levy Processes in Finance (NMAK13012U)                                           |--------------------------------------------------------------------------------------|
| • Bayes metoder og kreditibilitet i skadesforsikring (NMAK12015U)                  |--------------------------------------------------------------------------------------|
| • Consumption-Investment-Insurance Problems (NMAK14010U)                          |--------------------------------------------------------------------------------------|
| • Statistics for non-linear time series models 8                                   |--------------------------------------------------------------------------------------|</p>
<table>
<thead>
<tr>
<th>Course</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimal investment (NMAK14017U)</td>
<td>The course was a restricted elective subject element in the academic year 2015/16.</td>
</tr>
<tr>
<td>Monte Carlo Methods in Insurance and Finance (NMAK14014U)</td>
<td>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</td>
</tr>
<tr>
<td>Modeling dependence in discrete time (NMAK14013U)</td>
<td></td>
</tr>
<tr>
<td>Introduction to Extreme Value Theory (NMAK13005U)</td>
<td></td>
</tr>
<tr>
<td>Control Theory in Finance (NMAK15011U)</td>
<td>The course was a restricted elective subject element in the academic year 2015/16.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</td>
</tr>
<tr>
<td>Modelling Dependence in Non-Life Insurance (NMAK15018U)</td>
<td>The course was a restricted elective subject element in the academic year 2015/16.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</td>
</tr>
<tr>
<td>Statistics for non-linear time series models (NMAK14022U)</td>
<td>The course was a restricted elective subject element in the academic year 2015/16.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</td>
</tr>
<tr>
<td>Topics in Financial Risk Management (NMAK15024U)</td>
<td>The course was a restricted elective subject element in the academic year 2015/16.</td>
</tr>
<tr>
<td></td>
<td>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</td>
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<td>Phase-type distributions: Theory and applications (NMAK15019U)</td>
<td>The course was a restricted elective subject element in the academic year 2015/16.</td>
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<td>The course was offered for the last time in the academic year 2015/16 and a third exam is offered in the academic year 2016/17.</td>
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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.