

The Curriculum for Bachelor of Science in Applied Mathematics

The Curriculum for Bachelor of Science in Applied Mathematics

The Study Board for Science

Programme titles:

- Bachelor i anvendt matematik
- Bachelor of Science in Applied Mathematics

Effective date: 01-09-2021

Applicable for students enrolled as of: 01-09-2018

Version: Archive

ECTS value: 180

Cities: Odense

Semesters: Autumnx

▼ § 1 - Description of the Programme

▼ § 1.1 - Programme

Programme titles

Bachelor of Science in Applied Mathematics (Bachelor of Science (BSc))

Ministerial orders

Bekendtgørelse om ændring af bekendtgørelse om adgang til kandidatuddannelser ved universiteterne og de videregående kunstneriske uddannelsesinstitutioner på Uddannelses- og Forskningsministeriets område (BEK nr 257 af 19/03/2019)

Bekendtgørelse om ankenævn for afgørelser om merit i universitetsuddannelser (meritankenævnsbekendtgørelsen) (BEK nr 1517 af 16/12/2013)

Bekendtgørelse om ændring af bekendtgørelse om ankenævn for afgørelser om merit i universitetsuddannelser (meritankenævnsbekendtgørelsen) (BEK nr 880 af 26/08/2019)

Bekendtgørelse om ændring af bekendtgørelse om bachelor- og kandidatuddannelser ved universiteterne (uddannelsesbekendtgørelsen) (BEK nr 876 af 26/08/2019)

Bekendtgørelse om ændring af bekendtgørelse om eksamen og censur ved universitetsuddannelser (eksamensbekendtgørelsen) (BEK nr 1080 af 28/08/2018)

Bekendtgørelse om talentinitiativer på de videregående uddannelser på Uddannelses- og Forskningsministeriets område (talentbekendtgørelsen) (BEK nr 597 af 08/03/2015)

Ministerial Order on Bachelor and Master's (Candidatus) Programmes at Universities (the University Programme Order)

Bekendtgørelse om karakterskala og anden bedømmelse (BEK nr 262 af 20/03/2007)

Bekendtgørelse om ændring af bekendtgørelse om adgang til bacheloruddannelser ved universiteterne og de videregående kunstneriske uddannelsesinstitutioner på Uddannelses- og Forskningsministeriets område (BEK nr 263 af 19/03/2019)

Ministerial Order on University Examinations and Grading (the Examination Order) (BEK nr 1062 af 30/06/2016)

Bekendtgørelse om ændring af bekendtgørelse om adgang til bacheloruddannelser ved universiteterne og de videregående kunstneriske uddannelsesinstitutioner på Uddannelses- og Forskningsministeriets område (BEK nr 256 af 19/03/2019)

Bekendtgørelse om ændring af bekendtgørelse om adgang til bacheloruddannelser ved universiteterne og de videregående kunstneriske uddannelsesinstitutioner på Uddannelses- og Forskningsministeriets område (BEK nr 861 af 26/08/2019)

Bekendtgørelse om ændring af bekendtgørelse om eksamen og censur ved universitetsuddannelser (eksamensbekendtgørelsen) (BEK nr 878 af 26/08/2019)

Ministerial Order on Admission and Enrolment on Bachelor Programmes at Universities (BEK nr 107 af 12/02/2018)

Bekendtgørelse om ændring af bekendtgørelse om talentinitiativer på de videregående uddannelser på Uddannelses- og Forskningsministeriets område (talentbekendtgørelsen) (BEK nr 892 af 26/08/2019)

ECTS value
180

Academic Study Board
The Study Board for Science

Language
Danish

Cities
Odense

Semesters
Autumn

Level
Bachelor

▼ § 1.2 - Aim of Programme, including any professional profile and specialisations

See Danish version

▼ § 1.3 - Didactic and pedagogical basis

See Danish version

▼ § 1.4 - Profiles

▼ BSc major in Applied Mathematics - registration 1 September 2021

Name

BSc major in Applied Mathematics - registration 1 September 2021

Degree Qualifications profile

A graduate of the degree bachelor in applied mathematics has a basic knowledge of mathematical modelling and numerical analysis within natural science and engineering. The graduate has theoretical knowledge and practical experience in applying statistical methods, algorithms and data structures. He/she understand and reflects theory and practice in applied mathematics. The graduate can apply numerical methods to analyze theoretical and practical problems. He/she understands a models quantitative and qualitative properties. Moreover, the graduate is able to

a) formulate algorithms and perform computations to create insight

b) perform statistical analysis or data

c) evaluate modeling and computational errors for given problems

As a member of the institute's international environment, the graduate will understand the international dimension of applied mathematics; he will experience international and intercultural relations.

The bachelor education in applied mathematics provides knowledge and experience of research performed at the institute of mathematics and computer science.

1. the concrete knowledge provided by the degree is

a) knowledge of mathematical modeling and numerical analysis in natural science and engineering (MM533, MM546, MM547)

b) knowledge of basic theories and methods (MM505, MM536, MM537, MM538, MM539, MM541, MM548, MM551)

c) knowledge and experience in applying statistical methods and models (ST521, ST522, MM552)

d) knowledge on basic algorithms and how to implement them on appropriate data structures (DM562, DM507)

e) to understand and reflect over how to create insight in natural science by theory, modelling and simulation (MM552, MM553)

f) to understand and reflect theories, methods and practice within applied mathematics (FF501, MM546, MM547, BAMM501)

g) to understand the subject's international dimension

2. abilities obtained by the degree bachelor in applied mathematics

a) to analyze practical and theoretical problems by numerical simulation of appropriate mathematical models (MM533, MM546, MM547)

b) to analyze a model's qualitative and quantitative properties (MM546, MM547, ST522)

c) design algorithms and perform large scale computations to create scientific insight (DM507, MM552, MM553, ST522)

d) perform statistical analysis (ST521, ST522)

e) describe and evaluate sources of errors in modelling and simulation (MM533, MM546, MM547, ST522)

f) to select and argue for relevant tools and solution methods (MM546, MM547, ST521, BAMM501)

g) describe problems and communicate solutions to partners and non-specialists (FF501, MM546, MM561, BAMM501)

3. competences provided by the degree bachelor in applied mathematics

a) handle complex situations in study and work relations (FF501, MM546, MM561, BAMM501)

b) to independently contribute to interdisciplinary collaboration based on project-oriented teamwork (FF501, MM561)

c) identify needs and organize own learning (FF501, MM546, BAMM501, elective courses)

Employment profile

The education in applied mathematics is aimed at employment in the private business sector or in research institutions. Computer simulations are state of the art in all major technology companies. Many graduates also work in the finance industry.

Recommended course of study

| | | | | |
|------------|---|---|---|---|
| Semester 6 | BAMM501: Bachelor's project in Applied Mathematics N300018101 (15 ects) | | Elective (15 ects) | |
| Semester 5 | MM552: Computational Biology N300011101 (10 ects) | MM546: Partial differential equations: theory, modelling and simulation N300008101 (10 ects) | | MM553: Computational Physics N300012101 (10 ects) |
| Semester 4 | ST522: Computational Statistics N360003101 (10 ects) | MM548: Measure and Integration and Banach spaces N300038101 (7.5 ects) | DM507: Algorithms and Data Structures N330046101 (10 ects) | MM561: Innovation N300046101 01 (2.5 ects) |
| Semester 3 | DM562: Scientific Programming N330025101 (10 ects) | MM547: Ordinary Differential Equations: Theory, Modelling and Simulation N300009101 (10 ects) | | ST521: Mathematical Statistics N360000101 (10 ects) |
| Semester 2 | MM541: Combinatorial Mathematics N300036101 (5 ects) | MM539: Algebra 2 N300034101 (5 ects) | FF501: First year project N700006101 (10 ects) | MM533: Mathematical and Numerical Analysis N300033101 (10 ects) |
| Semester 1 | MM500: Study Introduction for Mathematics and Applied Mathematics N300051101 (5 ects) | MM536: Calculus for mathematics N300004101 (10 ects) | MM551: Algebra 1 N300010101 (5 ects) | MM505: Linear algebra N300000101 (5 ects) |
| | | | MM537: Introduction to Mathematical Methods N300005101 (5 ects) | NAT500: Study start test N700017101 |

= 1st year test

= Elective

= Constituent courses

▼ BSc major in Applied Mathematics - registration 1 September 2020

Name

BSc major in Applied Mathematics - registration 1 September 2020

Recommended course of study

▼ BSc major in Applied Mathematics - registration 1 September 2018 and 2019

Name

BSc major in Applied Mathematics - registration 1 September 2018 and 2019

Recommended course of study

| | | | | |
|-----------------------|--|---|--|--|
| Semester 6 30 ECTS | BAMM501: Bachelor's project in Applied Mathematics <u>N300018101</u> (15 ects) | | DM507: Algorithms and Data Structures <u>N300046101</u> (10 ects) | (5 ects) |
| Semester 5 30 ECTS | MM552: Computational Biology <u>N300011101</u> (10 ects) | | MM546: Partial differential equations: theory, modelling and simulation <u>N300008101</u> (10 ects) | MM553: Computational Physics <u>N300012101</u> (10 ects) |
| Semester 4 30 ECTS | ST522: Computational Statistics <u>N360003101</u> (10 ects) | | MM548: Measure and Integration and Banach spaces <u>N300038101</u> (7.5 ects) | MM561: Innovation <u>01</u> (2.5 ects) MM550: Perspectives on Mathematics <u>N300040101</u> (5 ects) Elective (5 ects) |
| Semester 3 30 ECTS | DM562: Scientific Programming <u>N330025101</u> (10 ects) | | MM547: Ordinary Differential Equations: Theory, Modelling and Simulation <u>N300009101</u> (10 ects) | ST521: Mathematical Statistics <u>N360000101</u> (10 ects) |
| Semester 2 30 ECTS | MM541: Combinatorial Mathematics <u>N300036101</u> (5 ects) | MM539: Algebra 2 <u>N300034101</u> (5 ects) | FF501: First year project <u>N700006101</u> (10 ects) | MM533: Mathematical and Numerical Analysis <u>N300033101</u> (10 ects) |
| Semester 1 30 ECTS | MM500: Study Introduction for Mathematics and Applied Mathematics <u>N300051101</u> (5 ects) | MM536: Calculus for mathematics <u>N300004101</u> (10 ects) | MM551: Algebra 1 <u>N300010101</u> (5 ects) | MM505: Linear algebra <u>N300000101</u> (5 ects) MM537: Introduction to Mathematical Methods <u>N300005101</u> (5 ects) |

Orange = 1st year test

Brown = Elective

Green = Constituent courses

NAT500: Study start test
N700017101

| | | | | |
|-----------------------|---|---|--|--|
| Semester 6 30 ECTS | BAMM501: Bachelor's project in Applied Mathematics <u>N300018101</u> (15 ects) | | Elective (10 ects) | MM550: Perspectives on Mathematics <u>N300040101</u> (5 ects) |
| Semester 5 30 ECTS | MM552: Computational Biology <u>N300011101</u> (10 ects) | | MM546: Partial differential equations: theory, modelling and simulation <u>N300008101</u> (10 ects) | MM553: Computational Physics <u>N300012101</u> (10 ects) |
| Semester 4 30 ECTS | ST522: Computational Statistics <u>N360003101</u> (10 ects) | | MM548: Measure and Integration and Banach spaces <u>N300038101</u> (7.5 ects) | MM561: Innovation <u>01</u> (2.5 ects) MM507: Algorithms and Data Structures <u>N300046101</u> (10 ects) |
| Semester 3 30 ECTS | DM562: Scientific Programming <u>N330025101</u> (10 ects) | | MM547: Ordinary Differential Equations: Theory, Modelling and Simulation <u>N300009101</u> (10 ects) | ST521: Mathematical Statistics <u>N360000101</u> (10 ects) |
| Semester 2 30 ECTS | MM541: Combinatorial Mathematics <u>N300036101</u> (5 ects) | MM539: Algebra 2 <u>N300034101</u> (5 ects) | FF501: First year project <u>N700006101</u> (10 ects) | MM533: Mathematical and Numerical Analysis <u>N300033101</u> (10 ects) |
| Semester 1 30 ECTS | FF500: Introduction to subject, research and community of practice <u>N700013101</u> (5 ects) | MM536: Calculus for mathematics <u>N300004101</u> (10 ects) | MM551: Algebra 1 <u>N300010101</u> (5 ects) | MM505: Linear algebra <u>N300000101</u> (5 ects) MM537: Introduction to Mathematical Methods <u>N300005101</u> (5 ects) |

FF500a: Study start test
N70002101

▼ No longer valid - 31 August 2021 BSc major in Applied Mathematics - registration 1 September 2020

Name

No longer valid - 31 August 2021 BSc major in Applied Mathematics - registration 1 September 2020

Recommended course of study

▼ § 2 - Enrollment

▼ § 2.1 - Tuition

See Danish version

▼ § 2.2 - Entry requirements

See Danish version

▼ § 3 - Structure and Progression

▼ § 3.1 - The structure of the programme

See Danish version

▼ § 4 - Course descriptions

▼ § 4.1 - Course descriptions

▼ FF500a: Studiestartsprøve

▼ Overriding description of outcome

That the student can manage oneself around the university and have knowledge of the university's study rules.

▼ Offered in

| | | | | | | |
|------------|--|--|--|---|--|--|
| Semester 6 | BAMM501: Bachelor's project in Applied Mathematics N300018101 (15 ects) | | Elective (10 ects) | | MM550: Perspectives on Mathematics N300040101 (5 ects) | |
| Semester 5 | MM552: Computational Biology N300011101 (10 ects) | | MM546: Partial differential equations: theory, modelling and simulation N300008101 (10 ects) | | MM553: Computational Physics N300012101 (10 ects) | |
| Semester 4 | ST522: Computational Statistics N360003101 (10 ects) | | MM548: Measure and Integration and Banach spaces N300038101 (7.5 ects) | DM507: Algorithms and Data Structures N330046101 (10 ects) | MM561: Innovation N3000461 01 (2.5 ects) | |
| Semester 3 | DM562: Scientific Programming N330025101 (10 ects) | | MM547: Ordinary Differential Equations: Theory, Modelling and Simulation N300009101 (10 ects) | | ST521: Mathematical Statistics N360000101 (10 ects) | |
| Semester 2 | MM541: Combinatorial Mathematics N300036101 (5 ects) | MM539: Algebra 2 N300034101 (5 ects) | FF501: First year project N700006101 (10 ects) | | MM533: Mathematical and Numerical Analysis N300033101 (10 ects) | |
| Semester 1 | MM500: Study Introduction for Mathematics and Applied Mathematics N300051101 (5 ects) | MM536: Calculus for mathematics N300004101 (10 ects) | | MM551: Algebra 1 N300010101 (5 ects) | MM505: Linear algebra N300000101 (5 ects) | |
| | | MM537: Introduction til Matematiske Metoder | | MM537: Introduction to Mathematical Methods N300005101 (5 ects) | | |

- = 1st year test
- = Elective
- = Constituent courses

Profile course descriptions

BSc major in Applied Mathematics - registration 1 September 2021

| | | | |
|-------------------|---|------------|------------------------|
| N300051101 | MM500: Studieintroduktion for Matematik og Anvendt Matematik | 5 | Udbyd som obligatorisk |
| N300000101 | MM505: Lineær algebra | 5 | Udbyd som obligatorisk |
| N300004101 | MM536: Calculus for Matematik | 10 | Udbyd som obligatorisk |
| N300005101 | MM537: Introduktion til Matematiske Metoder | 5 | Udbyd som obligatorisk |
| N300010101 | MM551: Algebra 1 | 5 | Udbyd som obligatorisk |
| N700017101 | NAT500: Studiestartsprøve | 0 | Udbyd som obligatorisk |
| N700006101 | FF501: Førsteårsprojekt | 10 | Udbyd som obligatorisk |
| N300033101 | MM533: Matematisk og numerisk analyse | 10 | Udbyd som obligatorisk |
| N300034101 | MM539: Algebra 2 | 5 | Udbyd som obligatorisk |
| N300036101 | MM541: Kombinatorisk matematik | 5 | Udbyd som obligatorisk |
| N330025101 | DM562: Scientific programming | 10 | Udbyd som obligatorisk |
| N300009101 | MM547: Ordinære differentialligninger: teori, modellering og beregning | 10 | Udbyd som obligatorisk |
| N360000101 | ST521: Matematisk statistik | 10 | Udbyd som obligatorisk |
| N330046101 | DM507: Algoritmer og Datastrukturer | 10 | Udbyd som obligatorisk |
| N300038101 | MM548: Mål- integralteori og Banachrum | 7.5 | Udbyd som obligatorisk |
| N300046101 | MM561: Innovation | 2.5 | Udbyd som obligatorisk |
| N360003101 | ST522: Beregningsmæssig statistik | 10 | Udbyd som obligatorisk |
| N300008101 | MM546: Partielle differentialligninger: teori, modellering og beregning | 10 | Udbyd som obligatorisk |
| N300011101 | MM552: Beregningsmæssig biologi | 10 | Udbyd som obligatorisk |
| N300012101 | MM553: Beregningsmæssig fysik | 10 | Udbyd som obligatorisk |
| N300018101 | BAMM501: Bachelorprojekt i anvendt matematik | 15 | Udbyd som obligatorisk |
| Valgfag | | 15 | |
| Total ECTS | | 180 | |

BSc major in Applied Mathematics - registration 1 September 2020

| | | | |
|-------------------|--|------------|------------------------|
| N300051101 | MM500: Studieintroduktion for Matematik og Anvendt Matematik | 5 | Udbyd som obligatorisk |
| N300000101 | MM505: Lineær algebra | 5 | Udbyd som obligatorisk |
| N300004101 | MM536: Calculus for Matematik | 10 | Udbyd som obligatorisk |
| N300005101 | MM537: Introduktion til Matematiske Metoder | 5 | Udbyd som obligatorisk |
| N300010101 | MM551: Algebra 1 | 5 | Udbyd som obligatorisk |
| Total ECTS | | 180 | |

| | | | |
|-------------------|---|------------|------------------------|
| N700017101 | NAT500: Studiestartsprøve | 0 | Udbyd som obligatorisk |
| N700006101 | FF501: Førsteårsprojekt | 10 | Udbyd som obligatorisk |
| N300033101 | MM533: Matematisk og numerisk analyse | 10 | Udbyd som obligatorisk |
| N300034101 | MM539: Algebra 2 | 5 | Udbyd som obligatorisk |
| N300036101 | MM541: Kombinatorisk matematik | 5 | Udbyd som obligatorisk |
| N330025101 | DM562: Scientific programming | 10 | Udbyd som obligatorisk |
| N300009101 | MM547: Ordinære differentialligninger: teori, modellering og beregning | 10 | Udbyd som obligatorisk |
| N360000101 | ST521: Matematisk statistik | 10 | Udbyd som obligatorisk |
| N300038101 | MM548: Mål- integralteori og Banachrum | 7.5 | Udbyd som obligatorisk |
| N300040101 | MM550: Perspektiver på matematik | 5 | Udbyd som obligatorisk |
| N300046101 | MM561: Innovation | 2.5 | Udbyd som obligatorisk |
| N360003101 | ST522: Beregningsmæssig statistik | 10 | Udbyd som obligatorisk |
| Valgfag | | 5 | |
| N300008101 | MM546: Partielle differentialligninger: teori, modellering og beregning | 10 | Udbyd som obligatorisk |
| N300011101 | MM552: Beregningsmæssig biologi | 10 | Udbyd som obligatorisk |
| N300012101 | MM553: Beregningsmæssig fysik | 10 | Udbyd som obligatorisk |
| N300018101 | BAMM501: Bachelorprojekt i anvendt matematik | 15 | Udbyd som obligatorisk |
| N330046101 | DM507: Algoritmer og Datastrukturer | 10 | Udbyd som obligatorisk |
| Valgfag | | 5 | |
| Total ECTS | | 180 | |

BSc major in Applied Mathematics - registration 1 September 2018 and 2019

| | | | |
|-------------------|---|------------|------------------------|
| N700013101 | FF500: Introduktion til fag, forskning og fællesskab | 5 | Udbyd som obligatorisk |
| N700002101 | FF500a: Studiestartsprøve | 0 | Udbyd som obligatorisk |
| N300000101 | MM505: Lineær algebra | 5 | Udbyd som obligatorisk |
| N300004101 | MM536: Calculus for Matematik | 10 | Udbyd som obligatorisk |
| N300005101 | MM537: Introduktion til Matematiske Metoder | 5 | Udbyd som obligatorisk |
| N300010101 | MM551: Algebra 1 | 5 | Udbyd som obligatorisk |
| N700006101 | FF501: Førsteårsprojekt | 10 | Udbyd som obligatorisk |
| N300033101 | MM533: Matematisk og numerisk analyse | 10 | Udbyd som obligatorisk |
| N300034101 | MM539: Algebra 2 | 5 | Udbyd som obligatorisk |
| N300036101 | MM541: Kombinatorisk matematik | 5 | Udbyd som obligatorisk |
| N330025101 | DM562: Scientific programming | 10 | Udbyd som obligatorisk |
| N300009101 | MM547: Ordinære differentialligninger: teori, modellering og beregning | 10 | Udbyd som obligatorisk |
| N360000101 | ST521: Matematisk statistik | 10 | Udbyd som obligatorisk |
| N330046101 | DM507: Algoritmer og Datastrukturer | 10 | Udbyd som obligatorisk |
| N300038101 | MM548: Mål- integralteori og Banachrum | 7.5 | Udbyd som obligatorisk |
| N300046101 | MM561: Innovation | 2.5 | Udbyd som obligatorisk |
| N360003101 | ST522: Beregningsmæssig statistik | 10 | Udbyd som obligatorisk |
| N300008101 | MM546: Partielle differentialligninger: teori, modellering og beregning | 10 | Udbyd som obligatorisk |
| N300011101 | MM552: Beregningsmæssig biologi | 10 | Udbyd som obligatorisk |
| N300012101 | MM553: Beregningsmæssig fysik | 10 | Udbyd som obligatorisk |
| N300018101 | BAMM501: Bachelorprojekt i anvendt matematik | 15 | Udbyd som obligatorisk |
| N300040101 | MM550: Perspektiver på matematik | 5 | Udbyd som obligatorisk |
| Valgfag | | 10 | |
| Total ECTS | | 180 | |

No longer valid - 31 August 2021 BSc major in Applied Mathematics - registration 1 September 2020

| | | | |
|-------------------|--|------------|------------------------|
| N300051101 | MM500: Studieintroduktion for Matematik og Anvendt Matematik | 5 | Udbyd som obligatorisk |
| N300000101 | MM505: Lineær algebra | 5 | Udbyd som obligatorisk |
| Total ECTS | | 180 | |

| | | | |
|-------------------|---|------------|------------------------|
| N300004101 | MM536: Calculus for Matematik | 10 | Udbyd som obligatorisk |
| N300005101 | MM537: Introduktion til Matematiske Metoder | 5 | Udbyd som obligatorisk |
| N300010101 | MM551: Algebra 1 | 5 | Udbyd som obligatorisk |
| N700017101 | NAT500: Studiestartsprøve | 0 | Udbyd som obligatorisk |
| N700006101 | FF501: Førsteårsprojekt | 10 | Udbyd som obligatorisk |
| N300033101 | MM533: Matematisk og numerisk analyse | 10 | Udbyd som obligatorisk |
| N300034101 | MM539: Algebra 2 | 5 | Udbyd som obligatorisk |
| N300036101 | MM541: Kombinatorisk matematik | 5 | Udbyd som obligatorisk |
| N330025101 | DM562: Scientific programming | 10 | Udbyd som obligatorisk |
| N300009101 | MM547: Ordinære differentialligninger: teori, modellering og beregning | 10 | Udbyd som obligatorisk |
| N360000101 | ST521: Matematisk statistik | 10 | Udbyd som obligatorisk |
| N330046101 | DM507: Algoritmer og Datastrukturer | 10 | Udbyd som obligatorisk |
| N300038101 | MM548: Mål- integralteori og Banachrum | 7.5 | Udbyd som obligatorisk |
| N300046101 | MM561: Innovation | 2.5 | Udbyd som obligatorisk |
| N360003101 | ST522: Beregningsmæssig statistik | 10 | Udbyd som obligatorisk |
| N300008101 | MM546: Partielle differentialligninger: teori, modellering og beregning | 10 | Udbyd som obligatorisk |
| N300011101 | MM552: Beregningsmæssig biologi | 10 | Udbyd som obligatorisk |
| N300012101 | MM553: Beregningsmæssig fysik | 10 | Udbyd som obligatorisk |
| N300018101 | BAMM501: Bachelorprojekt i anvendt matematik | 15 | Udbyd som obligatorisk |
| N300040101 | MM550: Perspektiver på matematik | 5 | Udbyd som obligatorisk |
| Valgfag | | 10 | |
| Total ECTS | | 180 | |

Course descriptions in the curriculum

Odense

▼ MM536: Calculus for Matematik

▼ Overriding description of outcome

The learning objectives of the course are that the student demonstrates the ability to:

- Apply methods and results from calculus to analyze and explain the behavior of the models presented during the course
- Formulate and, using a mathematical symbolic language, carry out arguments relating to mathematical problems within the syllabus of the course
- Solve mathematical problems within the syllabus of the course.

▼ Offered in

Odense

▼ ST522: Beregningsmæssig statistik

▼ Overriding description of outcome

The learning objective of the course is that the student demonstrates the ability to:

- Reproduce key theoretical results concerning elementary operations on random variables and vectors, and to apply these to simple theoretical assignments.
- Reproduce and apply the fundamental theorems of random variate generation.
- Simulate variates and vectors from the most common distributions.
- Evaluate the quality of a random number generator.
- Apply the basic principles of variance reduction.
- Simulate complex systems and investigate their properties.
- Use simulation to approximate integrals.
- Use simulation to compute p-values and confidence intervals.
- Investigate properties of statistical procedures and estimators using simulation.
- Perform programming relevant to the content of the course in the statistical package used in the course.
- Identify and interpret relevant information in the output of the statistical package used in the course.
- Summarize the results of an analysis in a statistical report.

▼ Offered in

Odense

▼ DM562: Scientific programming

▼ Overriding description of outcome

The learning objective of the course is that

the student demonstrates the ability to:

- design models for concrete problems.
- devise a program structure based on the model.
- implement the planned program in the concrete programming language used.
- find and use adequate elements in the program library belonging to the language.
- plan and execute a testing of the program.
- design and implement recursive solutions of problems;
- use basic tree structures and algorithms for these.
- make programs which uses the methods from linear algebra

▼ Offered in

Odense

▼ MM500: Studieintroduktion for Matematik og Anvendt Matematik

▼ Overriding description of outcome

Intended learning outcomes - after completing the course the student is expected to be able to:

- Applies study and learning strategies to organize hers/his own learning in relation to the intended learning outcomes, learning activities and assessment tasks.
- Establishes working relationships to his fellow students and describes his role as an active participant in the study program's social and academic learning activities
- Specifies and analyzes a problem in pre-formulated form and communicates the solving process and the result of the process.
- Identifies different science representations (textual, auditory, visual, symbolic, iconic, graphical, tabular, static or dynamic) and applies them in problem solving.

▼ Offered in

Odense

▼ FF500: Introduktion til fag, forskning og fællesskab

▼ Overriding description of outcome

Intended learning outcomes - after completing the course the student is expected to be able to:

- The student applies study and learning strategies to organize hers/his own learning in relation to the intended learning outcomes, learning activities and assessment tasks.
- The student establishes working relationships to his fellow students and describes his role as an active participant in the study program's social and academic learning activities
- The student specifies and analyzes a problem in pre-formulated form and communicates the solving process and the result of the process.
- The student identifies different science representations (textual, auditory, visual, symbolic, iconic, graphical, tabular, static or dynamic) and applies them in problem solving.

▼ Offered in

Odense

▼ MM505: Lineær algebra

▼ Overriding description of outcome

The learning objectives of the course are that the student demonstrates the ability to:

- Reproduce definitions and results covered in the course.
- Be able to use these results to analyse concrete examples.
- Formulate and present definitions and calculations in a mathematically rigorous way.

▼ Offered in

Odense

▼ MM561: Innovation

▼ Overriding description of outcome

The learning objective of the course is that the student demonstrates the ability to:

- discuss and identify roadblocks to innovation in research and industry
- synthesize information about a particular field into suggestions for innovative ideas, and critically identify their strong and weak points.

▼ Offered in

Odense

▼ FF501: Førsteårsprojekt

▼ Overriding description of outcome

At the end of the course the student is expected to:

- Plan and complete a project based on a scientific question and related design (theoretical project or experimental research)
- Handle the most common IT-tools
- Communicate, collaborate and share knowledge by itslearning og MS Teams
- Write a report and make a poster of the project
- Undertake a thorough literature search for analysis and discussion in the report, in the oral presentations and during the exam
- Communicate the project at a poster conference
- Make an oral presentation of the project at the exam
- Discuss and motivate important aspects of the project at the exam
- Demonstrate overview and skills to integrate important aspects of the project at the exam

▼ Offered in

Odense

▼ DM507: Algoritmer og Datastrukturer

▼ Overriding description of outcome

The learning objective of the course is that the student demonstrates the ability to:

- use the algorithms taught in the course on concrete problem instances.
- give precise arguments for the correctness or incorrectness of an algorithm.
- determine the asymptotic running time of an algorithm.
- adapt known algorithms and data structures to special cases of known problems or new problems.
- design new algorithms for problems similar to those taught in the course, including giving a precise description of the algorithm, e.g. using pseudocode.
- make expedient choices of data structures.
- design new data structures based on known data structures.
- design and implement a larger program, using algorithms and data structures taught in the course.
- give precise arguments for the choices made in connection with the previous four items.

▼ Offered in

Odense

▼ MM539: Algebra 2

▼ Overriding description of outcome

The learning objective of the course is that the student demonstrates the ability to:

- Understand and carry out reasoning pertaining to groups and their homomorphisms.
- Have knowledge of concrete examples of various types of groups and their properties.

▼ Offered in

Odense

▼ MM548: Mål- integralteori og Banachrum

▼ Overriding description of outcome

The learning objective of the course is that the student demonstrates the ability to:

- use methods from the theory to solve practical problems, especially related to the integral convergence theorems, Fubini's theorem, and calculate Fourier series
- present statements and proofs of items from an a priori given list of topics
- Answer additional questions from teachers and examiners around the central concepts and results from the above list
- Understand the basic theory in this area, including in particular concepts of sigma-algebra, measurability, integral
- use methods from the theory to solve problems related to measure and integration and Banach space theory
- give an oral and written presentation in correct mathematical language

▼ Offered in

Odense

▼ MM541: Kombinatorisk matematik

▼ Overriding description of outcome

The learning objective of the course is that the student demonstrates the ability to:

- Count the number of elements in a set.
- Formulate counting problem based on a written description.
- Solve linear recursion equations.
- Solve graph theoretical problems similar to the ones given in the course.
- Formulate linear programming problems and use the duality theorem.

▼ Offered in

Odense

▼ MM552: Beregningsmæssig biologi

▼ Overriding description of outcome

The learning objectives of the course are that the student demonstrates the ability to:

- Explain and understand the central dogma of molecular biology, central aspects of gene regulation, the basic principle of epigenetic DNA modifications, and specialties w.r.t. bacteria & phage genetics
- Model ontologies for biomedical data dependencies
- Design of systems biology databases
- Explain and implement DNA & amino acid sequence analysis methods (HMMs, scoring matrices, and efficient statistics with them on data structures like suffix arrays)
- Explain and implement statistical learning methods on biological networks (network enrichment)
- Explain the specialties of bacterial genetics (the operon prediction trick).
- Explain and implement methods for suffix trees, suffix arrays, and the Burrows-Wheeler transformation
- Explain de novo sequence pattern screening with EM algorithm and entropy models.
- Explain and implement basic methods for supervised and unsupervised data mining, as well as their application to biomedical OMICS data sets

▼ Offered in

Odense

▼ BAMM501: Bachelorprojekt i anvendt matematik

▼ Overriding description of outcome

At the conclusion of the bachelor's project, the student should be able to:

- Understand and analyze theories, methods and practice within applied mathematics.
- Select and apply relevant mathematical and computational methods.
- Present and describe in the project obtained knowledge in a precise and intelligible language.

▼ Offered in

Odense

▼ MM537: Introduktion til Matematiske Metoder

▼ Overriding description of outcome

As listed in the educations competency profile the course has explicit focus to give the students ability to formulate, go through and present mathematical arguments, as well as giving the ability to:

- formulate a statement in a logical correct way
- express yourself clearly and accurately
- prove mathematical statements by various proof methods such as a direct proof, indirect proof, use induction.
- use known concepts, results and techniques on known as well as new problems
- argue sufficiently for your solutions.

▼ Offered in

Odense

▼ MM546: Partielle differentialligninger: teori, modellering og beregning

▼ Overriding description of outcome

The learning objectives of the course are that the student demonstrates the ability to:

- Formulate a partial differential equation as a model for a simple problem.
- Classify 2nd order PDEs and describe their characteristic properties.
- Analyze and simulate partial differential equations by the methods taught in the course.
- Construct, implement and analyze numerical methods to compute (approximate) solutions to partial differential equations.
- Give a seminar presentation of the individual project and answer supplementary questions.

▼ Offered in

Odense

▼ MM550: Perspektiver på matematik

▼ Overriding description of outcome

The learning objective of the course is that the student demonstrates the ability to:

- reproduce central parts of the literature of the course.
- use the notions and concepts from the course correctly.
- relate relevant issues about the students subject to the theories presented in the course.
- Argue for independent points of view relevant for this course.

▼ Offered in

Odense

▼ MM551: Algebra 1

▼ Overriding description of outcome

The learning objectives of the course are that the student demonstrates the ability to:

- Reproduce definitions and results covered in the course.
- Be able to use these results to analyse concrete examples.
- Formulate and present definitions and calculations in a mathematically rigorous way.
- Reproduce proofs of certain simpler results from the course.

▼ Offered in

Odense

▼ MM553: Beregningsmæssig fysik

▼ Overriding description of outcome

The learning objectives of the course are that the student demonstrates the ability to:

- Demonstrate knowledge of the principles and algorithms covered during the course
- Select the most appropriate method to study numerically a given physical system.
- Implement solutions for new problems, based on the methods presented during the course
- Understand and consequently present in both written and oral forms the scientific results achieved.

▼ Offered in

Odense

▼ ST521: Matematisk statistik

▼ Overriding description of outcome

The learning objectives of the course are that the student demonstrates the ability to:

- master the theory and methods of mathematical statistics
- master the application of these in statistical inference

▼ Offered in

Odense

▼ MM547: Ordinære differentialligninger: teori, modellering og beregning

▼ Overriding description of outcome

The learning objectives of the course is that the student demonstrates the ability to:

1. Formulate a differential equation as a model for a simple problem
2. Solve differential equations by methods taught in the course
3. Find steady states and analyse the asymptotic behaviour of simple systems of differential equations.
4. Construct, implement and analyse numerical methods to compute (approximate) solutions to differential equations.
5. Give an oral presentation and answer supplementary questions on the course syllabus and the problems solved in mandatory assignments.

▼ Offered in

Odense

▼ NAT500: Studiestartsprøve

▼ Overriding description of outcome

That the student can manage oneself around the university and have knowledge of the university's study rules.

▼ Offered in

Odense

▼ MM533: Matematisk og numerisk analyse

▼ Overriding description of outcome

The learning objective of the course is that the student demonstrates the ability to:

- understand the abstract concepts of topological and metric spaces
- understand and work with the notions of compactness, continuity and convergence in the settings of topological and metric spaces
- understand the quantitative aspects of convergence in metric spaces
- analyse and conduct basic numerical methods for
 - root finding
 - interpolation
 - integration

▼ Offered in

Odense

▼ § 5 - Examination provisions

▼ § 5.1 - Programme passing requirements

See Danish version

▼ § 5.2 - Start of study exam

See Danish version

▼ § 5.3 - First year exam

See Danish version

▼ § 5.4 - Spelling and writing skills

See Danish version

▼ § 5.5 - Evaluation of examinations and tests

See Danish version

▼ § 5.6 - Exam language

See Danish version

▼ § 5.7 - Forms of assessment

See Danish version

▼ § 5.8 - Ordinary exams

See Danish version

▼ § 5.9 - Reexams

See Danish version

▼ § 5.10 - Exam attempts

See Danish version

▼ § 5.11 - Requirements for exams

See Danish version

▼ § 5.12 - Digital exams and aids

See Danish version

▼ § 5.13 - Special examination conditions

See Danish version

▼ **§ 5.14 - Irregularities at exams**

See Danish version

▼ **§ 5.15 - Group exams**

See Danish version

▼ **§ 6 - Credit transfer**

▼ **§ 6.1 - Transfer of credit**

See Danish version

▼ **§ 6.2 - Transfer of credit**

See Danish version

▼ **§ 6.3 - Credit**

See Danish version

▼ **§ 6.4 - Exemptions**

See Danish version

▼ **§ 7 - Provisions on the organisation of the programme**

▼ **§ 7.1 - Enrolment and unenrolment from teaching and exams**

See Danish version

▼ **§ 7.2 - Deadline for programme completion**

See Danish version

▼ **§ 7.3 - Study activity**

See Danish version

▼ **§ 7.4 - Leave**

See Danish version

▼ **§ 7.5 - Limitation on the number of entries**

See Danish version

▼ **§ 7.6 - Minor, elective subject and elective**

See Danish version

▼ **§ 8 - Exemptions and complaints procedures**

▼ **§ 8.1 - Dispensation from University regulations**

See Danish version

▼ **§ 8.2 - Complaints over exams**

See Danish version

▼ **§ 8.3 - Complaints over University decisions**

See Danish version

▼ **§ 9 - The affiliation of the programme**

▼ **§ 9.1 - Legal basis**

See Danish version

▼ **§ 9.2 - Academic Study Board**

The Study Board for Science

▼ **§ 9.3 - External examiners**

Corps of examiners for mathematics

▼ **§ 9.4 - Codes**

Ingen STO-kode fundet

▼ **§ 9.5 - Effective date**

01-09-2021

▼ **§ 9.6 - Applicable for students enrolled as of**

01-09-2018

▼ **§ 9.7 - Date of Study Board Approval**

10-11-2021

▼ **§ 9.8 - Date of Deans Approval**