Information Meeting – Spring 2020

9 OCTOBER 2019
Agenda

• General Information
  – Application Process, Programmes and Courses
  – Elective Courses
  – Special Studies LTH/ Exchange Studies

• Courses in Mathematics
• Courses in Mathematical Statistics
• Courses in Numerical Analysis
• Courses in Physics
Admission Round for Courses – Spring 2020

• Application round is open **16 September – 15 October** on antagning.se

• Programme students
  – Apply within the programme! Some courses are only available within the programme.
  – Programme students have priority.
  – Check the prerequisites that are stated in the course syllabi!

• Stand-alone courses
  – Are available at other departments, no study place guarantee.
  – For courses at LTH not available on antagning.se, apply for **special studies** at LTH!
Bachelor’s Programme in Mathematics

- 3 years, 180 higher education credits
- 3 main disciplines: Mathematics, Mathematical Statistics, Numerical Analysis

Structure:
- compulsory courses – first year, 60 credits
- alternative-compulsory courses, 45 credits in mathematics, statistics, numerical analysis - chosen from pre-defined list
- elective courses, 60 credits – at least 30 credits outside the mathematics
- Bachelor´s Degree Project, 15 credits – MATK11, MASK11, NUMK11
Bachelor’s Programme in Mathematics

COMPULSORY COURSES

➢ First semester
  • MATA21 Analysis in One Variable, 15 credits
  • MATA22 Linear Algebra 1, 7.5 credits
  • NUMA01 Computational Programming with Python, 7.5 credits

➢ Second semester
  • MATB21 Analysis in Several Variables 1, 7.5 credits – half pace, first half
  • MATB22 Linear Algebra 2, 7.5 credits – half pace, first half
  • MATB23 Analysis in Several Variables 2, 7.5 credits – half pace, second half
  • MATA23 Foundations of Algebra, 7.5 credits - half pace, second half
Bachelor’s Programme in Mathematics

ALTERNATIVELY COMPULSORY COURSES

Mathematics

- MATB13 Discrete Mathematics, 7.5 credits
- MATB24 Linear Analysis, 7.5 credits
- MATC12 Ordinary Differential Equations 1, 7.5 credits
- MATM11 Algebraic Structures, 7.5 credits
- MATM12 Analytic Functions, 15 credits
- MATM15 Number Theory, 7.5 credits
Bachelor´s Programme in Mathematics

ALTERNATIVELY COMPULSORY COURSES

- Mathematics – given in Spring 2020
  - MATB13 Discrete Mathematics, 7.5 credits, half pace, second half
  - MATB24 Linear Analysis, 7.5 credits, half pace, first half
  - MATC12 Ordinary Differential Equations 1, 7.5 credits
  - MATM11 Algebraic Structures, 7.5 credits, half pace, first half
  - MATM12 Analytic Functions, 15 credits
  - MATM15 Number Theory, 7.5 credits
Bachelor’s Programme in Mathematics

ALTERNATIVELY COMPULSORY COURSES

- Mathematical Statistics
  - MASA01 Mathematical Statistics, Basic Course, 15 credits
  - MASC01 Probability Theory, 7.5 credits
  - MASC02 Inference Theory, 7.5 credits
  - MASC03 Markov Processes, 7.5 credits
  - MASC04 Stationary Stochastic Processes, 7.5 credits
  - MASC05 Planning of Experiments, 7.5 credits
Bachelor’s Programme in Mathematics

ALTERNATIVELY COMPULSORY COURSES

- Mathematical Statistics – given in Spring 2020
  - MASA01 Mathematical Statistics, Basic Course, 15 credits
  - MASC01 Probability Theory, 7.5 credits, half pace, first half
  - MASC02 Inference Theory, 7.5 credits, half pace, second half
  - MASC03 Markov Processes, 7.5 credits
  - MASC04 Stationary Stochastic Processes, 7.5 credits
  - MASC05 Design of Experiments, 7.5 credits, half pace, second half
Bachelor’s Programme in Mathematics

ALTERNATIVELY COMPULSORY COURSES

➢ Numerical Analysis
  • NUMA41 Basic Course in Numerical Analysis, 7.5 credits
  • NUMA11 Numerical Linear Algebra, 7.5 credits
  • NUMN19 Numerical Approximation, 7.5 credits
Bachelor's Programme in Mathematics

ALTERNATIVELY COMPULSORY COURSES

- Numerical Analysis – given in Spring 2020
  - NUMA41 Basic Course in Numerical Analysis, 7.5 credits, half pace, second half
  - NUMA11 Numerical Linear Algebra, 7.5 credits
  - NUMN19 Numerical Approximation, 7.5 credits, half pace, first half
Bachelor’s Programme in Mathematics

ELECTIVE COURSES – 60 CREDITS

• 30 credits must be outside the mathematical disciplines

• More courses in mathematics, statistics and numerical analysis are available

• See complete list of courses on
  http://www ctr.maths.lu.se/education/mathematics-bachelor-s-programme/courses/

• See recommended study path on
  http://www.maths.lu.se/english/education/mathematics-bachelors-programme/programme-structure/recommended-study-path/
Bachelor’s Programme in Mathematics

ELECTIVE COURSES

- Physics – see [www.fysik.lu.se/english/education](http://www.fysik.lu.se/english/education)
  
  » Physics 1 (given in Swedish every Autumn, and English every Spring)
    - FYSA12 Introduction to University Physics with General Physics, 15 credits
    - FYSA13 Introduction to University Physics with Optics, Waves and Quantum Physics, 7.5 credits
    - FYSA14 Introduction to University Physics with Thermodynamics, Climate and Experimental Methodology, 7.5 credits
  
  » Physics 2:
    - FYSB11 Basic Quantum Mechanics, Spring second half
    - FYTB14 Classical Mechanics and Special Relativity, Spring first half
    - follow up with FYTN09 advanced course
Bachelor’s Programme in Mathematics

ELECTIVE COURSES

- Economics – see www.nek.lu.se/en
  » In Swedish
    - NEKA12 – National Economy, Basic Course, 30 credits,
      - consisting of several courses that can be taken separately.

  » In English
    - Bachelor’s Programme in International Business, started Autumn 2019
    - Bachelor’s Programme in Economy and Society, started Autumn 2019
Bachelor’s Programme in Mathematics

ELECTIVE COURSES

– Special studies LTH – see http://www.student.lth.se/studieinformation/specialstudier/
  » Up to 30 credits, online application
  » You need a letter of attestation from programme coordinator stating that the courses can be included in your programme

– Exchange studies– see https://www.science.lu.se/education/international-opportunities/outgoing-exchange
  » One or two semesters at one of our partner universities
  » You can apply for exchange studies in mathematics (department agreements), science (faculty agreements) or other subject areas (university agreements).
Bachelor’s Programme in Mathematics

ELECTIVE COURSES

– Computer Science – LTH

» EDAA01, Programming second course 7.5 credits, Swedish, Spring, first half
» EDAA25, C-Programming, 3 credits, Swedish, Spring, first half
» EDAF05, Algorithms, Datastructures and Complexity, 5 credits, Spring second half
» EDAF50 C++ Programming, 7.5 credits, Spring, first half
» EDAF15 Algorithm Implementation, 5 credits, Spring, second half
» EDAP01 Artificial Intelligence, 7.5 credits, Spring, first half
» EDAN40 Functional programming, 7.5 credits, Spring, second half
Bachelor’s Programme in Mathematics

DEGREE PROJECT - 15 CREDITS

• Can be done in
  – Mathematics – course code MATK11
  – Mathematical Statistics - course code MASK11
  – Numerical Analysis – course code NUMK11

• These are only available within the programme! Before you apply contact
  – Anna-Maria Persson for MATK11
  – Magnus Wiktorsson for MASK11
  – Claus Führer för NUMK11
Master’s Programme in Mathematics

• 2 years, 120 higher education credits, starting only in an autumn semester

• Two specialisations: Mathematics and Numerical Analysis

• Structure:
  - alternative-compulsory courses, 45 credits in mathematics/numerical analysis (chosen from pre-defined list, according to your specialisation)
  - NUMN17 and NUMN17 compulsory for the numerical analysis specialisation
  - elective courses, 45 credits (at most 30 credits at basic level)
Master’s Programme in Mathematics

• 2 years, 120 higher education credits, starting only in an autumn semester

• Two specialisations: Mathematics and Numerical Analysis

• Structure:
  - alternative-compulsory courses, 45 credits in mathematics/numerical analysis (chosen from pre-defined list, according to your specialisation)
  - elective courses, 45 credits (at most 30 credits at basic level)
  - degree project – Master’s thesis, 30 credits – MATM01 or NUMM11
Master’s Programme in Mathematics

• Course selection
  – First semester: courses are selected at the introductory meeting
  – Upcoming semester: you apply for the courses within your programme on antagning.se (deadline 15 October for courses in Spring 2020)
  – Follow your specialisation, check prerequisites, consult the student counsellors
  – Practical information: http://www.maths.lu.se/english/education/mathematics-masters-programme/
Courses in Mathematics, Spring 2020

UPPER BASIC LEVEL

• MATB21 Analysis in Several Variables 1, 7.5 hp – half pace, first half
• MATB22 Linear Algebra 2, 7.5 hp – half pace, first half
• MATB23 Analysis in Several Variables 2, 7.5 hp – half pace, second half
• MATA23 Foundations of Algebra, 7.5 hp - half pace, second half

• MATB24 Linear Analysis, 7.5 credits - half pace, first half
• MATB13 Discrete Mathematics, 7.5 hp - half pace, second half
• MATC25 Calculus of Variations, 7.5 hp - quarter pace, whole semester
Courses in Mathematics, Spring 2020

ADVANCED LEVEL

• MATM11 Algebraic Structures, 7.5 hp – half pace, first half
• MATM16 Topology, 7.5 hp – half pace, second half
• MATM18 Fourier Analysis, 7.5 hp – half pace, second half
• MATM20 Mathematical Modelling, 7.5 hp – half pace, second half
• MATM19 Integration Theory, 7.5 hp – half pace, first half
• MATM23 Specialised Course in Differential Geometry, 7.5 hp - quarter pace
• MATM27 Ordinary Differential Equations 2, 7.5 hp - half pace, first half
• MATM29 Specialised Course in Integration Theory, 7.5 hp – half pace, second half
• MATP13 Group and Ring Theory, 7.5 credits - half pace, second half
• MATP16 Partial Differential Equations, 7.5 credits - quarter pace
Courses in Numerical Analysis, Spring 2020

UPPER BASIC LEVEL

• NUMA41 Basic Course in Numerical Analysis, 7.5 credits – half pace, second half

ADVANCED LEVEL

• NUMN05 Simulation Tools 7.5 credits – half pace, first half
• NUMN17 Seminar Course in Numerical Analysis 7.5 credits – quater pace
• NUMN19 Numerical Approximation 7.5 credits – half pace, first half
• NUMN30 Iterative Solutions of Large Scale Systems in Scientific Computing, 7.5 credits – half pace, second half