Faculty of Health, Science and Technology
Mathematics

# Syllabus

## Mathematics Preparatory D

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| **Course Code:** | MABX43 |
| **Course Title:** | Mathematics Preparatory D<br>*Matematik Bas D* |
| **Credits:** | 7.5 |
| **Degree Level:** | Preparatory |
| **Progressive Specialisation:** | () |

**Major Field of Study:**

**Course Approval**
The syllabus was approved by the Faculty of Health, Science and Technology 2019-02-18, and is valid from the Autumn semester 2019 at Karlstad University.

**Prerequisites**
Registration on Mathematics Preparatory A, 7.5 ECTS credits, Mathematics Preparatory B, 7.5 ECTS credits, and Mathematics Preparatory C, 7.5 ECTS credits, or equivalent

**Learning Outcomes**
Upon completion of the course, students should be able to:
- give an account of the concept differential equation,
- formulate and analyse differential equations as models for simple everyday problems,
- use some common methods for solving first and second order differential equations,
- use algebraic and graphical methods to determine integrals,
- calculate area and volume of rotation using integrals,
- perform calculations using complex numbers in various forms, including rectangular, polar, and scientific notation forms,
- perform polynomial division,

- apply the factor theorem and solve polynomial equations with complex roots, and
- apply the concepts and methods used in the course in practical problem solution.

**Content**
The course covers mainly the following:
- integrals,
- applications of integrals,
- differential equations,
- differential equations as models for simple everyday problems,
- methods for solving some basic types of differential equations,
- calculation with complex numbers,
- the complex number plane,
- complex numbers in rectangular, polar, and scientific notation forms,
- polynomial equations, polynomial division, the factor theorem.

**Reading List**
See separate document.

**Examination**
Assessment is individual and based on a written exam. The number of examination opportunities is limited to three per academic year.

**Grades**
One of the grades Pass (G) or Fail (U) is awarded in the examination of the course. (RB C2018/824)

**Quality Assurance**
Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

**Course Certificate**
A course certificate will be provided upon request.

**Additional information**
The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.