Mathematics 3A (STÆ3A06)
Preliminary University Studies Department

Course description
This course centers on logarithms, power rules and exponential functions. In addition, the course will cover limits, asymptotes and continuity. Moreover, the concept of functions will be discussed and the various methods applied to functions. The concept of limit, including one-sided limit and limit at infinity, is defined through mathematical analysis. Work will be done on the definition of a derivative, finding the first and second derivative of a function and taking a look at the function's graph/s.

Prerequisites (required preparation)
10 credits, competence level 2

Competence level
3

Credits
6

By the end of the course

The student has acquired knowledge and understanding of:

- the concept of functions
- power rules, exponential- and logarithm rules
- limit/s
- the basic methods to differentiate
- rules of differentiation: sum, multiplication and quotient of a derivative and in addition the student should be able to calculate the derivative of several different known functions
- local extrema, monotonic function, point of inflexion and where the function changes concavity
- using computer programs to solve problems
- income, cost and profit functions

The student has acquired the skill to:

- work with different functions and draw them using a table of values or with the help of the computer program, Geogebra
- apply the rules of power, exponential- and logarithms in problems that are related to daily life, as for example in calculating population growth and more
- calculate simple limits and infinity limits
- calculate derivative problems in an organized manner in accordance with rules of derivation
- examine different functions of derivatives, i.e. local extrema and point of inflexion
- say where the function is increasing and decreasing
- solve the first and second derivative of a function
- calculate real problems based on issues from the economy, i.e. income, cost or profit

Student can use the knowledge and skill which he/she has acquired to:

- understand and apply the meaning and relation of concepts in the curriculum
- write his/her solutions systematically, share ideas with others about them and explain their ideas and tasks, verbally or graphically
- use critical and creative thinking and show initiative and intuition in solving problems
- apply methodical techniques in seeking solutions to problems, i.e. through proofs and equations
- follow and understand verbal and written assignments and apply simple reasoning
- apply methodical techniques in seeking solutions to problems linked to known solutions in similar problems, work his/her way back from known variables or by setting up equations
- understand the relation of mathematics to everyday life

Course assessment
The course is assessed in a variety of ways, there among group work, individual assignments, quizzes and a final exam that will make up part of the final grade.