



APPLIES TO ACADEMIC YEAR 2012/2013

## MET 1180 Mathematics

### Programme

Bachelor of Science in Business (1. year)

### Responsible for the course

Dag Einar Sommervoll

### Department

Department of Economics

### Term

According to study plan

### ECTS Credits

7,5

### Language of instruction

Norwegian

### Introduction

### Learning outcome

#### Acquired knowledge

After completing the course, the student will have acquired an understanding of basic algebra, functions on one and two variables, basic financial mathematics, integration and linear algebra.

#### Acquired skills

After completing the course, the student will have acquired at least the following abilities:

- Ability to compute the derivative of standard functions that can be expressed as the compositions of rational functions, logarithmic functions and exponential functions.
- Ability to analyze the sign of the derivative of a function and deduce where the function is increasing and where it is decreasing.
- Ability to find maxima and minima of a function from a sign diagram for its derivative or by using the second derivative test
- Understanding the notions of marginal cost, marginal revenue and marginal profit and be able to deduce these as functions.
- Understanding the notion of elasticity and be able to compute it.
- Ability to compute the sum of different types of series and use these in connection with present values and annuities.
- Ability to compute integrals of different kinds of functions using partial integration, substitution and the method of partial fractions.
- Ability to compute partial derivatives of first and second order of functions in two variables
- Know the maximum theorem and be able to find the global maximum and minimum of a function defined on a closed and bounded region in the plane.
- Know how to use implicit differentiation
- Ability to identify the stationary points of a function in two variables and classify these using the second derivative test.
- Ability to use the method of Lagrange multipliers for finding a maximum of a function given one constraint.
- Ability to solve systems of linear equations using matrices.
- Know basic power series expansion of functions.

#### Reflection

After completing the course the student will have enhanced his analytic skills. The student should also be able to reflect on results of computations and have a critical attitude to their validity.

#### Prerequisites

Basic knowledge of mathematics equivalent to the admission requirement for the programme.

#### Compulsory reading

##### Books:

Sommervoll, Dag Einar. 2012. Matematikk for økonomifag. 2 utg.. Gyldendal akademisk

## Recommended reading

### Books:

Sommervoll, Dag Einar. 2011. Hjelper til matematikk for økonomifag. Gyldendal akademisk

### Other:

I tillegg til litteraturen vil det bli brukt tidligere eksamensoppgaver. Tilgjengelig gjennom BIs eksamensdatabase

### Course outline

- Introductory topics
- Functions
- Differentiation and applications
- Exponential and logarithmic functions
- Sequences and series
- Integrals
- Functions of more than one variable
- Linear algebra

### Computer-based tools

No specified computer-based tools are required.

### Learning process and workload

The course is lectured over one year and consists of an introductory part (36 hours) and an advanced part (48 hours).

Introductory part - Taught throughout the autumn semester.

Advanced part - Starts after the introductory part in autumn and continues in spring term.

For each week there will be exercises and reading assignments. The student must gain knowledge from the material presented in the reading assignments and work through the exercises. Some of the exercises will be reviewed in class the following week. It is assumed that the student has worked on the exercise in order to take full advantage of the review.

By allocating some time in class to short assignment related to new topics, students will be activated and learning objectives achieved.

### Recommended use of hours:

Activity	Intro - ductory part	Adv anced part
<b>Participation in teaching activities – Introductory part</b>	36	
Preparation for lectures/reading literature	10	
Assignments outside lecture hours	14	
<b>Participation in teaching activities – Advanced part</b>		48
Preparation for lectures/reading literature		71
Assignments outside lecture hours		73
Multiple-choice examination		3
Written examination		5
<b>Total recommended use of time</b>	<b>60</b>	<b>200</b>

### Use of hours

**Examination**

The final grade in the course is based on following activities:

Individual mid-term assignment half way through autumn term. Pass/Fail.

A three-hour individual written multiple-choice examination at the end of autumn term. Counts 30 % towards final grade.

A five-hour individual written examination at the end of spring term. Counts 70 % towards final grade.

To obtain final grade all parts must be passed. A re-sit can be taken in each separate part.

**Examination code(s)**

MET 11801 - Written assignment. Pass/Fail

MET 11802 - Multiple choice. Counts 30% towards the final grade in MET 1180 Mathematics, 7,5 credits.

MET 11803 - Written exam. Counts 70% towards the final grade in MET 1180 Mathematics, 7,5 credits.

**Examination support materials**

Multiple-choice examination - All support materials plus calculator TEXAS INSTRUMENTS BA II Plus™ are allowed.

Written examination - All support materials plus calculator TEXAS INSTRUMENTS BA II Plus™ are allowed.

Students are encouraged to bring solutions to previous assignments from the course. For more information, please see See <http://www.bi.edu/studenthandbook/examaids>.

**Re-sit examination**

Re-sit examination is offered every term.

**Additional information**