

**Introduction to the use of MATLAB in Research, 3.0 credits**

Introduktion till MATLAB i forskning, 3.0 hp

Third-cycle education course

6FIFM57

Department of Physics, Chemistry and Biology

Valid from: First half-year 2024

**Approved by**

**Approved**

**Registration number**

## Entry requirements

Entry requirement for studies on third-cycle education courses

- second-cycle degree,
- 240 credits in required courses, including at least 60 second-cycle credits or acquisition of equivalent knowledge in some other manner

## Learning outcomes

By the end of the course the students will be able to:

- Explain how MATLAB can be used in their research field.
- Discuss about different possibilities that MATLAB offers into their research field.
- Develop the necessary code in MATLAB to solve a problem related to their research field.
- Understand how MATLAB code works and where to find information about how it works.
- Discuss the advantages and limitations of a chosen approach for a MATLAB program.

## Contents

The course intends to give the basics to the use of MATLAB in research. The course will comprise 6 sessions of 1 h length, which topics include the most relevant aspects to start using MATLAB:

1. Introduction to programming;
2. MATLAB environment and data types available (including vectors and matrices);
3. Scripts and selection statements and loops;
4. Input and output of data;
5. Use of toolboxes;
6. Simulink.

## Educational methods

Educational methods applied in this course are lectures and a seminar\*. \*The lectures (one per topic) will be divided in two parts. During the first part, the course responsible will introduce the topic, whereas during the second part short exercises will be done by the students and commented to strengthen the knowledge acquired during the first part. The idea with these sessions is to give the students the basic knowledge about the different studied topics so the students can discover and further explore the possibilities that MATLAB offers.

In order to apply the knowledge acquired during the course, the students will propose and develop a personal project, such a script or Simulink code, that will be useful for them to be applied in their own research. Such projects will be presented in a last longer, seminar-like session by each of the students to the rest of the class.

## **Examination**

To pass the course, the students will need to do the short exercises proposed after each theoretical introduction plus the personal project and its presentation in the seminar. Besides, the students should actively participate in both, discussion of the short exercises and during the seminar-like session.

## **Grading**

Two-grade scale

## **Course literature**

Recommended literature will be provided by the course coordinator during the course.

## **General information**

The course is planned and carried out according to what is stated in this syllabus. Course evaluation, analysis and suggestions for improvement should be fed back to the Research and PhD studies Committee (FUN) by the course coordinator. If the course is withdrawn or is subject to major changes, examination according to this syllabus is normally offered at three occasions within/in close connection to the two following semesters.