



GÖTEBORGS UNIVERSITET

Introduction to mathematics for researchers, 15 hp

Kursperiod / Course period: 17 August, 2017 to 8 June, 2018	Sista anmälningdatum / Deadline for application: 1 June, 2017
Kontaktperson / Anmälningadress: Bo Johannesson / bo.johannesson@marine.gu.se	
Course description (Advertisement for students): <p>Refresh your knowledge in maths and get a deeper understanding of concepts and theory! Here we offer a broad and basic graduate course in mathematics. For problem solving and verification of your results you will learn how to use the computer efficiently for graphs, numerical calculations and algebra.</p> <p>The course is primarily aimed at graduate students from all faculties, but other categories from the academy, as well as students from other universities are also welcome. This part time course is flexible and designed to take place largely over the Internet supplemented with a few on-campus meetings.</p> <p>The course is based on the book <i>Introduction to Mathematics for Life Scientists</i> by Edward Batschelet (http://korta.nu/Batschelet). Reading instructions and examples of solutions will be distributed. For all chapters a selection of each student's solutions will be shared with the other participants and each student will also be asked to comment on a number of the solutions of their peers. This will promote the ability to use mathematics in a clear and conscious way and to be creative in collaborations.</p>	

Responsible department and other participation departments/organisations: Department of Marine Sciences
Teachers: Bo Johannesson (Course leader and main contact)
Examiner: Per Jonsson

Faculty of Science; Departmen of Marine Sciences



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Third cycle education

1. Confirmation

The syllabus was confirmed by the Head of the Department of Marine Sciences 2016-11-17.

Disciplinary domain: Science

Department in charge: Department of Marine Sciences

2. Position in the educational system

Elective course; third-cycle education.

3. Entry requirements

Admitted to third cycle education.

4. Course content

Introduction to mathematics.

5. Outcomes

1. Knowledge and understanding

- Arithmetic
- Sets and Symbolic Logic
- Functions
- Trigonometry
- Graphical and Numerical Methods
- Calculus
- Probability
- Matrices and Vectors
- Complex Numbers

2. Skills and abilities

- Comprehend mathematical theory
- Problem solving and verification
- Communicate and discuss theory involving mathematical procedures

3. Judgement and approach

- Solutions to problems and comments to others solutions are evaluated



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- Students read in the textbook and work with examples and problems using the help given in instructions and worked problems from the teacher
- Communication is mainly in discussion forums on the course website

6. Required reading

Batschelet, Edward. Introduction to Mathematics for Life Scientists. 3rd ed. 1979.

7. Assessment

At the end of each chapter in the textbook one finds a number of problems, which each student is required to solve. In the examination a selection of each student's solutions will be shared with the other participants at the course website and each student will also be asked to comment on a number of the solutions of their peers. The teacher will check all published solutions and comments and suggest corrections and modifications, if required. The dialog will continue until everyone is satisfied with all solutions.

If a student is not able to participate in the discussion of a particular chapter he or she can do it later and then have all the discussions around the problems with the teacher.

A Ph.D. student who has failed a test twice has the right to change examiners, if it is possible. A written application should be sent to the Department.

In cases where a course has been discontinued or major changes have been made a Ph.D. should be guaranteed at least three examination occasions (including the ordinary examination occasion) during a time of at least one year from the last time the course was given.

8. Grading scale

The grading scale comprises Fail, (U), Pass (G)

9. Course Evaluation

The course evaluation is carried out together with the students at the end of the course, and is followed by an individual, anonymous survey. The results and possible changes in the course will be shared with the students who participated in the evaluation and to those who are beginning the course.

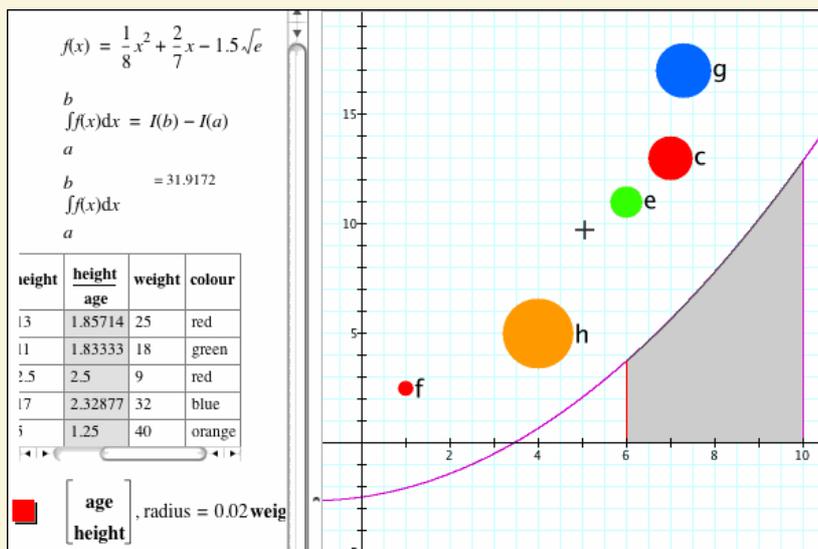
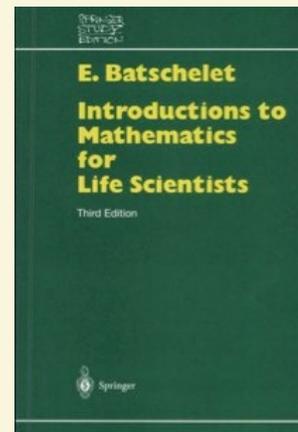
10. Language of instruction

The language of instruction is English.

MATHS FOR RESEARCHERS

Introduction to mathematics for researchers

Take the opportunity to refresh and deepen your knowledge in basic mathematics. For most types of calculations (not only numerical!) you will learn how to use web applications and computer software. This means that you can focus on theory and concepts, so that you will be good at using maths for problem solving and for discussing theories in your research field.



This graduate level course is primarily aimed at students from all faculties. The course is flexible and designed to take place largely over the Internet. Before studying the assigned chapters, reading instructions and examples of solutions will be distributed. At the end of each chapter one finds a number of problems, which each student

is required to solve. A selection of each student's solutions will be shared with the other participants and each student will also be asked to comment on a number of the solutions of their peers. This procedure aims to promote the ability to use mathematics in a clear and conscious way and to discuss and understand it.

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