Mathematical Modelling

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Lecture 0

Mathematical modelling - introductory lecture

0.1 Introduction

0.1.1 What is mathematical modelling?

Most maths is created to explain something around us. While maths is very exact, looking at the world around us is not. By using maths, we can make predictions about the world around us. This is called mathematical modelling.

As with everything we can model at different complexity levels, we prefer the more simple models, since it's both more easy to understand and to calculate.

0.1.2 Why models?

By using mathematical models, we can help ourselves and others to understand our world, with this we can predict our future, simulate what happens if we change something and much much more.

0.1.3 Course philosophy

Every week we'll get a set of problems, not always obvious what exactly to do. We have to figure out what equations to use, what's the best way to try and solve the problem, it might not be possible to get a perfect answer, but we have to try.

0.1.4 Course structure

Day	Thing to do
Monday	Introductive lecture
Tuesday and wednesday	Supervised sessions
Wednesday	Follow-up lecture for the previous week
Friday	another supervised session
Sunday	Submission and reflection

Spend time thinking of the problems before trying to solve them, if you jump right in it might turn out slower than first trying to understand the question.
Start simple and gradually increase the complexity of the model. Stop when it's good enough, don't try to get a perfect answer.

0.1.5 Reflection

1. What did you learn?

   compare your solution to the correct one

   What was done well, what was not done as well?

   Reflect on both your solutions and your process

   Correct solutions for any problems that were incorrect

2. How well did you solve the problems?

3. Self-check