



Course description

Simulation modeling is an approach often used in the veterinary and human medicine for modeling disease spread and control. The course will focus on fundamental concepts in modeling. It will teach the student how to structure a system into a simulation model and the fundamental aspects that must be considered when building a simulation model of disease spread. The student will learn how to model diseases using SIS, SIR and SEIR infection model structures. Students will be introduced to modelling using difference and differential equations as well as mechanistic modelling. An important part of simulation is how to present model results in a clear and coherent way. Students will learn how to collect the results either during the simulations or after, and to present them in tables and graphics.

Course requirements

Basic knowledge and experience of programming using the software R.

Learning objectives

Students who have met the course objectives will be able to:

- Construct a simple deterministic model
- Construct a dynamic simulation model using difference and differential equations
- Construct a stochastic and dynamic mechanistic simulation model

- Select appropriate infection models
- Model different mechanisms of disease spread between individuals as well as disease control
- Collect the results from the simulations in a sound way and present them visually

Course materials

Complete notes, R code, relevant scientific papers

Course information

Course language: English

ECTS points: 5

Target group: Post-graduate students in veterinary and medical infectious diseases fields

Location: Camperdown Campus and on-line

Fee: AUD 500

Teaching form: E-learning and on-site lectures, computer exercises and group work.

Duration:

1 week off-site self-study (during 3—21 June 2019)

1 week of on-site teaching including lectures and group work (24-28 June 2019)

1 week off-site work on own project (1-5 July 2019)

Assessment: Evaluation of an assignment.

Aid: None

Evaluation: Passed/Not passed, internal examiner (final report provided)

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Instructors

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