


Mathematical Modelling of COVID-19



This course will equip you with the **fundamentals of Infectious Disease Modelling**, focusing on **COVID-19**. We'll explore how diseases spread, considering factors like social distancing and vaccination. You'll learn about mathematical tools used to simulate these scenarios. The course uses a **blend of online lectures, group activities, discussions, and presentations**. We'll begin with the **SIR model**, a basic framework for disease transmission, followed by the **concept of the R0** (basic reproduction number). We'll then delve into more complex models that incorporate features like **asymptomatic cases, vaccination, and hospitalization**. Finally, we'll specifically **focus on COVID-19 models**, exploring **public health interventions and vaccination strategies**. You'll gain hands-on experience through simulations and even present your findings in a small group setting.

Prerequisites

This course is open to PhD students, Master's students, and researchers with an interest in the topic.

No specific prerequisites.

Capacity : 10 to 30 people



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PROGRAM

The course will introduce students to the field of Infectious Disease Modelling (also called Mathematical Epidemiology), in particular to modelling studies of COVID-19. We will discuss models of disease transmission, including social distancing, confinement, hospitalization and vaccination. Mathematical simulation tools will also be introduced.

Teaching Method:

Includes online lectures, small group activity modules, discussion periods (entire class, and small groups), and some small group presentations, broken down into 6 modules:

- (1) Introduction to the basic model of disease transmission, the SIR model + simulation
- (2) Introduction to the basic reproduction number R_0
- (3) Overview of simple extensions to the basic model of disease transmission to include asymptomatic infection, vaccination, and hospitalization + simulation
- (4) Introduction to COVID-19 models including public health mitigation strategies,
- (5) Extension of COVID-19 models to include vaccination
- (6) Simulation of models of COVID-19 with vaccination + short group presentation

Duration : 3 days

Training Objectives

The aim of this course is to introduce students interested in the topic to the field of Infectious Disease Modelling through discussion and simulation of COVID-19 models spread in the population. Through engaging discussions and interactive simulations, students and researchers will explore how mathematical models can be used to understand and predict the spread of infectious diseases within a population. This in-depth exploration of COVID-19 will not only provide a strong foundation in infectious disease modelling but also equip them with the skills to analyze and interpret real-world outbreaks, ultimately contributing to more effective public health responses.

Registration deadline :

Date :

Schedule :

Place :