

MA650

Mathematical Models for Infectious Diseases

Credit: 3-0-0-3

Students intended for: P.G. students

Elective or Compulsory: Elective

Semester: Odd/Even

Course objective:

The intensive course is designed for the postgraduate students with an interest in quantitative approaches to infectious disease dynamics and control in humans.

Course content:

Over the last two decades, mathematical models have seen a huge development in all aspects of infectious diseases, from microbiology to epidemiology and evolution. The programme covers introductory and advanced concepts in mathematical modelling of infectious diseases, including:

- Mathematical review (calculus, probabilities...)
- Deterministic and stochastic models
- Network analysis
- Within-host dynamics of viral and bacterial infections
- Applied programming with R
- Statistical data modelling
- Computer-based simulations

Text & Reference Books:

- **O. Diekmann**, and **J. A. P. Heesterbeek**, *Mathematical Epidemiology of Infectious Diseases: Model Building, Analysis and Interpretation* (Wiley Series in Mathematical & Computational Biology). 2000.
- **D. J. Daley** and, **J. Gani**, *Epidemic Modelling: An Introduction* (Cambridge Studies in Mathematical Biology), 2001.