

# EPIB 638. MATHEMATICAL MODELING OF INFECTIOUS DISEASES.

---

Credits: 3

Offered by: Epidemiology and Biostatistics (Graduate Studies)

Terms offered: Winter 2026

[View offerings for Winter 2026 in Visual Schedule Builder.](#)

## Description

Mathematical models of infectious diseases –computer simulations of epidemics–enable detailed analyses and understanding of factors affecting the distribution of infections/diseases in populations and now play a key role in policy making. Covered topics include: short-term dynamics of infections ( $R_0$ ), compartmental models, stochastic models (including agent-based), contact patterns and heterogeneity, and Bayesian model calibration. The learning objectives are: 1) recognize research questions that can be addressed using modeling; 2) develop, parameterize, calibrate, and analyze simple infectious disease models in R; and 3) critically appraise scientific modeling papers.

- Prerequisite(s): EPIB 621 or permission of the instructor
- Restrictions: Not open to students who have taken EPIB 676 when topic was "Mathematical Models of Infectious Diseases".
- This is an intermediate-level quantitative course. Previous courses in calculus and biostatistics are recommended (in doubt, contact the instructor prior to registration). A working knowledge of the R statistical software (or equivalent) is mandatory (data structures, function, loop, etc.).

Most students use Visual Schedule Builder (VSB) to organize their schedules. VSB helps you plan class schedules, travel time, and more.

[Launch Visual Schedule Builder](#)