HACETTEPE UNIVERSITY

GENERAL SEMINAR

October 26, 2023
Thursday
20:00

Zoom Link: URL
Meeting ID: 822 8036 2919
Passcode: 884461

DEPARTMENT OF
MATHEMATICS

SPEAKER

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TITLE

Investigating Infectious Disease Transmission by Time-Scale Modeling Approach

ABSTRACT

Compartmental models, applied to investigate the dynamics of infectious diseases such as COVID-19, swine influenza, tuberculosis, measles, and strep throat, also determine evaluating the risk factors, suitable treatment methods, and predicting and controlling a possible outbreak.
Mathematical modeling of infectious diseases with the SIR (susceptible-infected-recovered) framework was initiated by Bernoulli in [6]. Motivated by our earlier and current research on mathematical modeling of HIV-1 in [1], Mammary Tumors and Pseudomonas putida in [2], swine influenza in [4], and tuberculosis in [5], we observe that time-scale modeling approach play an important role to recover information from experimental data with varying domains (time-scales), [7] and [8]. In this talk, we propose time-scale models, covering wide classes of models from continuous to discrete, for infectious diseases, especially HIV, swine influenza, and tuberculosis. In addition, we discuss the stability results of the models based on the basic reproduction number and demonstrate our numerical results.

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