



Mathematical Biology Seminar

Monday, October 17, 2022

3 pm MDT (In person)

3-25 SAB

Join Zoom Meeting

<https://ualberta-ca.zoom.us/j/98497695684?pwd=SG5pcUVRS0xucW5xd0xBTm1VVCtEUT09>

Meeting ID: 984 9769 5684

Passcode: 32123

Pablo Venegas Garcia

Department of Mathematical and Statistical Sciences

University of Alberta



Mathematical Modelling applied in Soil Biodegradation Processes

Biodegradation in soils has many implications for humankind. The importance of studying this process relies upon, for example, the impact of global warming, increasing food security and mitigating soil degradation. From the diverse problems to tackle, reducing greenhouse gas emissions has been a topic of interest for the last decades. In this talk, I will present various models for different problems to estimate greenhouse emissions from soil biodegradation in anaerobic and aerobic conditions. These models form part of my current research, and one of my goals is to create and improve mathematical models that would be suitable for studying soil biodegradation processes. On the one hand, I will talk about my current experiment in methane biogenesis from oil sands tailings and how the data collected during the last three years may contribute to increasing the methane biogenesis predictions in situ. On the other hand, I will present a new heuristic stoichiometric mathematical model to accurately predict soil carbon dioxide emissions when different labile compounds are used as soil treatments. These models were validated with experimental data, and further extensions for such models will be explored as the discussion of other mechanistic models.