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ĐẠI HỌC BÁCH KHOA HÀ NỘI

HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

ONE LOVE. ONE FUTURE.

Mathematical Modeling

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Individual Project

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Outline

- List of projects
- Requirements
- Project allocation
- Submission

List of project

1. Jam formation in traffic flow on a highway with some slowdown sections
2. Chaos control and schedule of shuttle buses
3. The night driving behavior in a car-following model
4. The spread of gossip in American schools
5. Basics of modelling the pedestrian flow
6. Effects of superspreaders in spread of epidemic
7. Stability and bifurcation of a simple food chain in a chemostat with removal rates

References for the topics can be downloaded from the class Teams

General requirements

1. **Report**
   - Introduction to the problem
   - What is the modeling approach chosen by the reference, and why was that approach selected?
   - Detailed description of the mathematical model
   - What is the solving algorithm?
   - What is the conclusion from the reference?
   - Discussion about the sensitivity analysis and robustness of the proposed model
2. **Code**
   - Reimplement the simulator introduced in the reference
   - Run some simulations mentioned in the reference

Project allocation

- RAMDONLY

Submission

- Submission includes 3 files:
  - Report of approximately 10 pages
  - Code
  - Supported material
- Submission system: Teams, Assignment
- Deadline: 23 June 2025

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THANK YOU !