生物数学建模

An Introduction to Mathematical Modeling in the Life Sciences

Lecturers: Drs. Jackson Champer & Louis Tao

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Textbook: *Dynamic Models in Biology*, Stephen Ellner and John Guckenheimer, Princeton University Press (2006)

Other References: *Mathematical Models in Biology*, Leah Edelstein-Keshet; *Nonlinear Dynamics and Chaos*, Steven Strogatz; *Mathematical Models: Mechanical Vibrations, Population Dynamics and Traffic Flow*, Richard Haberman

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Course website: Log-on to http://course.pku.edu.cn (011-01139732)

在校学生输入账号密码后，在自己的界面里面点击生物数学建模即可。

校外学生点击用户名密码下面的"访客登陆"，在出现界面里搜索"生物数学建模"，即可进入课程界面。

Grades: Problem Sets (PS) 50%, Project Presentation 5%, Final Project 45%

Lectures will be in English and mostly on blackboard. Matlab will be used extensively.

Tentative Lecture Schedule

(Actual schedule may vary)

1) 2/21 Introduction, Linear models [Reading: EG Chap. 1; Lab Manual 1-5]
2) 2/28 Linear Models [Reading: EG Chap. 2; Lab Manual 6-9]
3) 3/06 Linear Models
4) 3/13 Nonlinear Models & PS 1 due
5) 3/20 Stochastics [Reading: EG Chap. 3.1-3.3, Lab Manual 11]
6) 3/27 Stochastics
7) 4/03 Intro to Dynamical Systems (Jackson) & PS 2 due [Reading: EG Ch. 4, 5; Lab Manual 13-14]
8) 4/10 Intro to Dynamical System (Jackson) [Reading: EG Ch. 5, 6]
9) 4/17 Hodgkin-Huxley Neuronal Model & PS 3 due
10) 4/24 Hodgkin-Huxley Dynamics & Phase Plane Analysis
11) 5/01 May Day [No lecture]
12) 5/07 Excitable Systems & PS 4 due
13) 5/15 Special Topics: Gene Drive (Jackson)
14) 5/22 In-class Group Presentations
15) 5/29 In-class Group Presentations
16) 6/05 Scaling Phenomena or other special topics; PS 5 due [Reading: EG Ch. 8]

Final Project due date to be determined