

Spring 2022 Course Syllabus: **Biol470**

Course Title:	Dynamic Principles in Systems Biology
Textbook:	“Mathematical Models in Systems Biology (an introduction)” by Brian P. Ingalls - MIT Press (2013) - ISBN: 978-0-262-01888-3.
Recommended Books:	<p>“An Introduction to Systems Biology: Design Principles of Biological Circuits” by U. Alon, CRC Press (2020)</p> <p>“Mathematical Physiology” by J. Keener and J. Sneyd, Interdisciplinary Applied Mathematics, Springer (1998).</p> <p>“Mathematical Models in Biology” by L. Edelstein-Keshet, SIAM Classics in Applied Mathematics 46, SIAM (2004)</p> <p>“Mathematics Applied to Deterministic Problems in the Natural Sciences” by C. C. Lin & L. A. Segel, SIAM Classics in Applied Mathematics, SIAM (1998).</p>
Prerequisites:	Math222, and BNFO135 or CS100 or CS115 grade C or better, or Permission by instructor
Website:	http://web.njit.edu/~horacio/IntroSysBio/IntroSysBioS22.html

Week	Topic	Assignment
1	Introduction to Systems Biology Review of ODEs and analytical methods	See course website
2	Review of Matlab / Python Numerical methods to analyze dynamic models	“
3	Parameter estimation for Dynamic models Modeling chemical reactions	“
4	Modeling chemical reaction networks	“
5	Biochemical kinetics	“
6	Biochemical kinetics	“
7	Introduction to dynamical systems	“
8	Analysis of dynamic mathematical models	“
9	Metabolic networks	“
10	Metabolic networks	“
11	Signal transduction pathways	

12	Gene regulatory networks	“
13	Student presentations	“
14	Student Presentations	“
15	Student Presentations	

IMPORTANT DATES	
FIRST DAY OF SEMESTER	Jan 18, 2022
LAST DAY TO ADD/DROP	Jan 24, 2022
SPRING RECESS	March 14-19, 2022
LAST DAY TO WITHDRAW	April 4, 2022
LAST DAY OF CLASSES	May 3, 2022
FINAL EXAM PERIOD	May 6-12, 2022

Grading Policy (tentative)

Assignment Weighting	
Homework, Quizzes & Class Participation	40
Midterm Project / Presentation	30
Final Project / Presentation	30

Tentative Grading Scale	
A	90 -- 100
B+	85 – 89
B	80 – 84
C+	75 – 79
C	70 – 74
D	60 – 69
F	0 -- 59

Course Policies: [See course website](#)

COVID-19 Safety Requirements

All persons physically present in any department facility or classroom shall comply fully with the NJIT COVID-19 safety policy at all times. Masks must be worn before entry to all department facilities, and social distancing guidelines must be followed. Individuals who are unable to wear a face mask due to medical reasons should contact the Office of Disability Services or Human Resources. Students who enter a classroom without wearing a mask properly, or remove their mask, will be cautioned by the instructor. The same is true for students who disregard the seating order or guidelines for social distancing. Students with obvious symptoms of respiratory illness should not come to campus and will be asked to leave. Students who do not comply with a request by a department instructor to adjust their behavior, in accordance with the University Policy, will be subject to disciplinary actions. Instructors have the right to expel the student or terminate the class session at which any student fails to comply with the University Policy.

Important Departmental and University Policies

- [Academic Integrity Code is Strictly Enforced](#)

- [Prerequisites Requirements are Enforced](#)
- [Attendance is Required in Lower-Division Courses](#)
- [Exam Policies \(No Make Up Exams and More\)](#)
- [Cell Phone and Pager Use Prohibited in Class](#)
- [Drop Date \(April 4, 2022\) is Strictly Observed](#)
- [Complete DMS Course Policies \(math.njit.edu/students/undergraduate/policies_math\)](http://math.njit.edu/students/undergraduate/policies_math)

Prepared by Prof. Horacio G. Rotstein, December 13, 2022