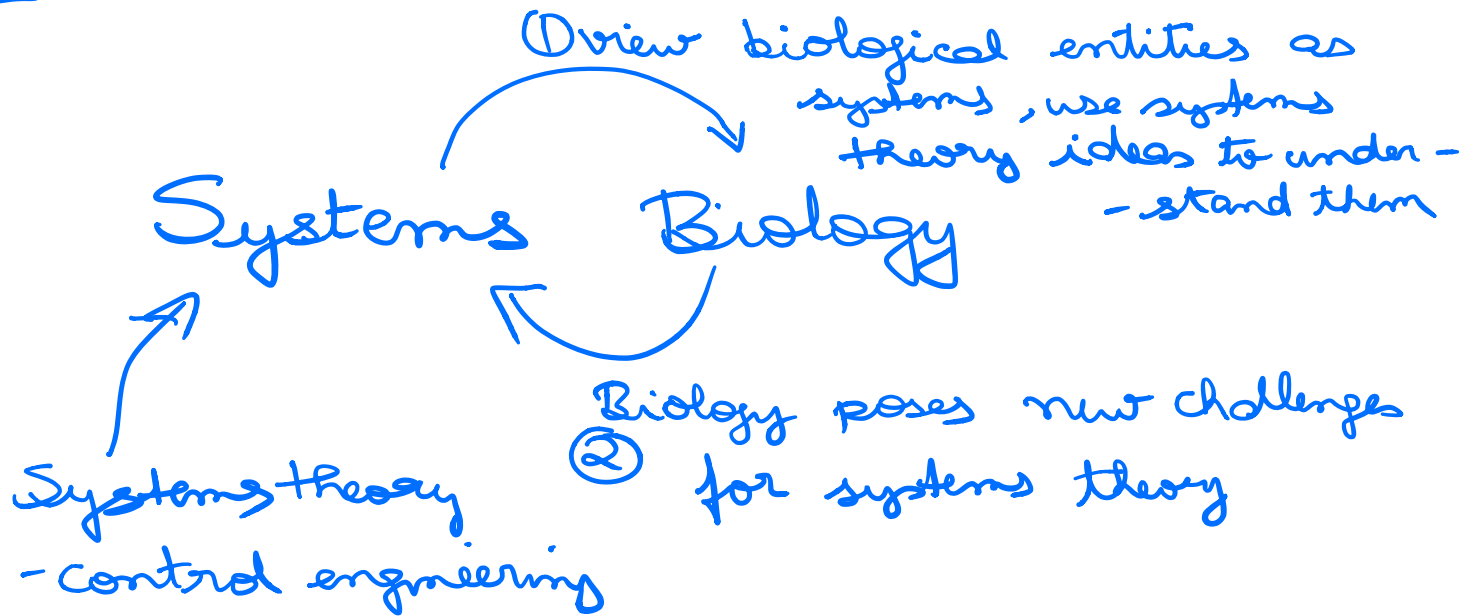


ELL 707

Systems Biology

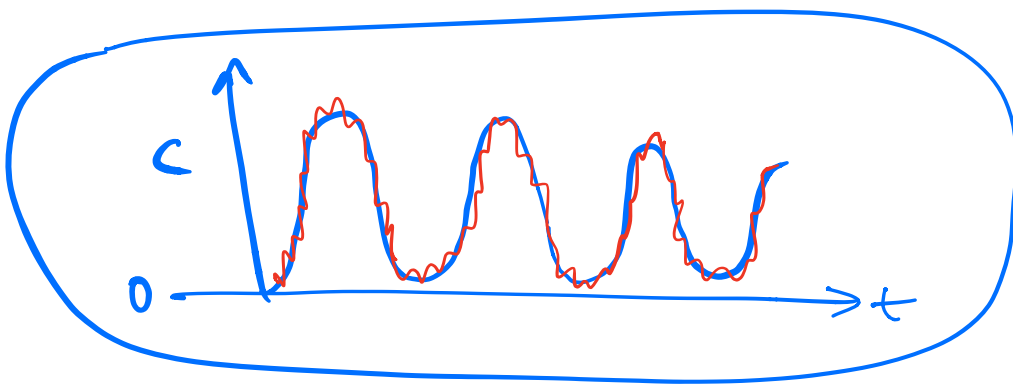
Shamuk Sen

1. What is this course about?



Example: Oscillation of protein concentrations inside cells

bacterial E. coli



Question
→ oscillations are random or not-random

Yes & No

How can we generate oscillations?

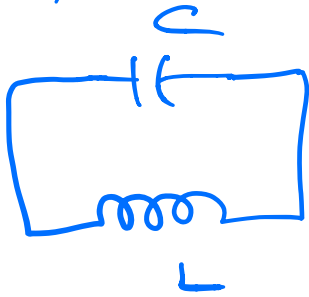
How are oscillations generated?

→ Where have you seen oscillations before?

→ sound waves (electromagnetic waves)



$$m\ddot{x} + kx = 0, \quad x(0) = 1, \\ \dot{x}(0) = 0$$



(similar equation)

We want to study and design biological "circuits" that oscillate.

2. Background

"familiarity with control engineering, differential equation."

Briefly write about your background.

Reference books

- del Vecchio & Murray
"Biomolecular Feedback Systems"
- Alon
"Introduction To Systems Biology"

3. Course Policy

Major Test = 34%

Minor Tests = 34% (17% each)

Project / Quiz ^{↳ unannounced} = 32%

12 → 10 Quiz opportunity = 32%
(6/10 considered)

2 presentations
(2/2 considered) 100%

Audit Pass : 55%

(Rest as per Institute Rules)

LH 613

MW 11-12

Th 12-1

Any Suggestions/
clarifications

4. How do you think such a course is of relevance to your academics?