

COLLEGE OF CHEMISTRY COURSE GUIDE (../INDEX.HTML)

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BIOE 103 - ENGINEERING MOLECULES (4 UNITS)

(Taken from the UC Berkeley Course Guide (<http://guide.berkeley.edu>))

COURSE OVERVIEW

SUMMARY

Thermodynamic and kinetic concepts applied to understanding the chemistry and structure of biomolecules (proteins, membranes, DNA, and RNA) and their thermodynamic and kinetic features in the crowded cellular environment. Topics include entropy, bioenergetics, free energy, chemical potential, reaction kinetics, enzyme kinetics, diffusion and transport, non-equilibrium systems, and their connections to the cellular environment.

PREREQUISITES

BIO 1A ([bio1a.html](#)) or BIOE 11 ([bioe11.html](#)); PHYS 7A ([phys7a.html](#)), PHYS 7B ([phys7b.html](#)), MATH 1A ([math1a.html](#)), MATH 1B ([math1b.html](#)), MATH 53 ([math53.html](#)), and MATH 54 ([math54.html](#)).

Students will receive no credit for BIOE 103 after completing Chemistry 120B ([chem120b.html](#)), or MCB C100A/CHEM C130 ([chemc130.html](#)).

Fall only

TOPICS COVERED

(1) To introduce the basics of thermodynamics and chemical kinetics for molecular to cellular biological systems; (2) To give students an understanding of biological size and timescales illustrated through computational exercises on model problems in physical biology.

Students will be able to (1) relate statistical thermodynamics and chemical kinetics to analyze molecular and cellular behavior beyond the ideal gas and Carnot cycle.

WORKLOAD

TIME COMMITMENT

15 weeks - 3 hours of lecture and 1 hour of discussion per week.

UC Berkeley Course Guide (<http://guide.berkeley.edu>)

COLLEGE OF CHEMISTRY PEER SERVICES

Made by Angela Lee, c/o 2019



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