Instructor: J. Lew
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MCDB 108B – General Biochemistry: Human Energy Metabolism
Winter Quarter 2013

This course focuses on the *principles of human energy metabolism*. How animals harness energy from food, concepts of metabolic flow, the fundamental pathways for energy production, and the interrelationships of the major body organs for energy production in humans will be covered. Applications to understanding human nutrition and disease, starvation, and obesity will also be covered.

Prerequisites: C in MCDB 108A.

Textbook: Lehninger: Principals of Biochemistry by Nelson & Cox 5th ed. 2008
Alternate: Biochemistry by Berg, Tymoczko & Stryer, 6th ed. 2007; or 5th ed. 2002

Students need to review:
- Basic Thermodynamics – (see handout on course website at: https://gauchospace.ucsb.edu/)
- Organic chemistry – reactions of carbonyl compounds (from any standard organic chemisty textbook)

Discussion Sections will start the week of Jan 16.
TA's: Michael Kaplan
Grant Gucinski

Office hours for Dr. Lew: Fri 3-5 pm; additional hrs before exams

Resources for study:
- Lecture slides available at: https://gauchospace.ucsb.edu/
- 5 Problem set handouts
- Lehninger
- Stryer

GRADING:

Midterm	33%
Final	67%

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MCDB 108B – Syllabus

Introduction to Metabolism; Energy Requirements of Humans

Review of Equilibrium & Free Energy
Steady-State flux & Metabolic Control

Basic enzymology
Regulation of Metabolic Enzymes

'High Energy' Phosphoryl Compounds; Coupled Reactions

Carbohydrates

Glycolysis

Citric Acid Cycle

MIDTERM

Gluconeogenesis

Redox Reactions; Oxidative Phosphorylation

Glycogen Metabolism; cAMP cascade

Fatty Acid Metabolism

Integration of Metabolism; Exercise, Starvation, Diabetes, Weight Control

Dietary Aspects of Proteins; Essential Amino Acids

FINAL EXAM