

Section 1, 3 credits, Index 44678

Meeting location and times: TBA

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Office Hours: By appointment.

Goals: This course is one of the four core graduate level biochemistry courses offered at USU. This course will focus on a detailed analysis of the principles of energy transformations in living systems. This will include a general introduction to energy requirements for living systems, thermodynamics relevant to biochemistry, core energy pathways (e.g., substrate level and oxidative phosphorylation, photosynthesis, etc.), and the diversity of fueling reactions found in living organisms. Students will gain in-depth knowledge from specialty text books, current reviews, and primary literature on these topics.

Meetings Total contact time for this course will be ~2000 min (equivalent to forty-50 min lectures). The lecture days and times will be established during the first week of classes and will be arranged as 3 lectures per week for 75 min each. In scheduling the class time, first priority will be to accommodate biochemistry graduate students.

Text: A current high level biochemistry text book such as *Lehninger Principles of Biochemistry*, 5th edition, 2008, by Nelson and Cox is recommended as background reading. This book is available for purchase in the bookstore, but any current edition biochemistry book should work fine. Content beyond the textbook level will be drawn from a variety of specialty books, current review articles, and the primary literature. Materials for the course, including literature, will be available on the course Blackboard page.

Prerequisites: A full year of undergraduate organic chemistry; a comprehensive upper division undergraduate course in biochemistry (comparable to CHEM 5700-5710 at USU), with physical chemistry recommended.

Online Info: Classroom handouts, class standings, exam keys, etc. will be available on the course Blackboard page at bb.usu.edu. Username = banner ID; password = banner pin.

Exams: There will be three, one hour examinations worth 100 points each during the course. Missed exams will be scored as a zero. Make-up exams are possible only for excused absences by prior appointment.

Team Project: A team project, as described in the attached document, will constitute a portion of the points in the course. The written report will be worth 50 points and the team presentation will be worth 50 points.

Grading: Grading is based on the points earned on the exams and the team project components. The final letter grade will be determined by comparing the total points earned to the total points possible. Grading will be curved with consideration of the performance of the entire class and previous classes.

Three exams @ 100 points each.....	300 points
Team project report @ 50 points.....	50 points
Team project presentation @ 50 points.....	<u>50 points</u>
Total	400 points

Assessment: Assessment of the course will include a Course Evaluation (the blue forms administered by USU) at the end of the course and a mid-term Survey (administered by the Professor) seeking input on course direction and suggestions for improvement. Information from the Course Evaluation and Survey will be used to improve the course this year and in subsequent years.

Provisions: This course will adhere to the USU Academic Policies and Procedures Manual found at the web site <http://www.usu.edu/policies/>. Any student with a disability who requires accommodation must contact the instructor. The disability must be documented by the Disability Resource Center. Course materials may be requested in alternative formats.

Outline of Topics to be Covered, Chem 6760, Fall 2009

Lecture Module	Title	Topics
1	Introduction	Management of Energy in Living Systems
2	Bioenergetics	Core concepts of Thermodynamics First and Second Laws Equilibria and Free Energy Electrochemistry and Electron Transfer
3	Core Metabolism	
	3A	Glycolysis
	3B	TCA
	3C	Fats and Proteins
	3D	OxPhosph
	3E	Photosynthesis
4	Metabolic Diversity	Aerobic and Anaerobic Respiration Nitrogen Fixation
5	Acetogenesis	Acetogenesis
6	Methanogenesis	Methanogenesis

Chemistry 6760, Calendar, Fall 2009, W333

Day	Date	Time	Meeting	Topic	Notes
M	8/24	1 pm	1	Module 1	ML151
W	8/26	12 pm	2	Module 1, 2	ML151
R	8/27	12 pm	3	Module 2	ML151
M	8/31	9 AM	4	Module 2	W333
W	9/2	9 AM	5	Module 2	
F	9/4	8 AM	6	Module 2	
M	9/7			No class	Holiday
W	9/9			No class	No class
F	9/11	8 AM	7	Module 2	Team Project idea due by 5 PM
M	9/14	9 AM	8	Module 3	
W	9/16	9 AM	9	Module 3	
F	9/18	8 AM	10	Exam 1	Exam 1
M	9/21	9 AM	11	Module 3	
W	9/23	9 AM	12	Module 3	
F	9/25	8 AM	13	Module 3	
M	9/28	9 AM	14	Module 3	
W	9/30	9 AM	15	Module 3	
F	10/2			No class	No class
M	10/5			No class	No class
W	10/7			No class	No class
F	10/9			No class	No class
M	10/12	9 AM	16	Module 3	
W	10/14	9 AM	17	Module 3	
F	10/16			No class	Fall break
M	10/19	9 AM	18	Module 4	
W	10/21	9 AM	19	Exam 2	Exam 2
F	10/23			No class	No class
M	10/26	9 AM	20	Module 4	
W	10/28	9 AM	21	Module 4	
F	10/30	8 AM	22	Module 4	
M	11/2	9 AM	23	Module 5	
W	11/4	9 AM	24	Module 5	
F	11/6	8 AM	25	Module 6	Team report due by 5 PM
M	11/9	9 AM	26	Module 6	
W	11/11	9 AM	27	Module 6	
F	11/13	8 AM	28	Exam 3	Exam 3
M	11/16	9 AM	29	Presentations	Presentations W330
W	11/18	9 AM	30	Presentations	Presentations W330
F	11/20	8 AM	31	Presentations	Presentations W330
M	11/23			No class	No class
W	11/25			Holiday	Holiday
F	11/27			Holiday	Holiday