Chemistry 6760, Spring 2019
Principles of Bioenergetics
Utah State University
1 credit (660 minutes)
Meeting location and times: TBA
Prof. Lance C. Seefeldt, W241, 797-3964, lance.seefeldt@usu.edu

OFFICE HOURS:
By appointment.

GOALS:
This course is part of the core graduate level biochemistry courses offered at USU. This section will focus on an in-depth analysis of the principles of energy transformations in living systems. This will include coverage of 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
The lecture days and times will be established during the first week of classes. In scheduling the class meeting times, first priority will be to accommodate biochemistry graduate students.

TEXT:
A current biochemistry text book such as *Lehninger Principles of Biochemistry*, by Nelson and Cox is recommended as background reading. 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 Canvas page.

PREREQUISITES:
A full year of undergraduate organic chemistry; a full year of undergraduate 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 Canvas page at canvas.usu.edu. Username = banner ID; password = banner pin.

EXAMS:
There will be two examinations worth 150 points each during the course. Missed exams will be scored as a zero. Make-up exams are possible only for excused absences by appointment. Exams are open book/notes. Connection to the internet is not allowed during the exams.

GRADING:
Grading is based on the points earned on the exams. 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.

Two exams @ 150 points each……	300 points

Total	300 points

ASSESSMENT:
Assessment of the course will include the University online IDEA evaluation conducted at the end of the course. Information from the evaluation will be used to improve the course.

PROVISIONS: This course will adhere to the USU Academic Policies and Procedures Manual found at the web site http://www.usu.edu/policies/ and in the student code http://www.usu.edu/studentservices/studentcode/. 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

Lecture Module	Title	Topics
1	Introduction	Management of Energy in Living Systems
2	Bioenergetics	Core concepts of Thermodynamics Laws of Thermodynamics Equilibrium and Free Energy Electrochemistry and Electron Transfer
3	Core Metabolism	
	3A	Glycolysis
	3B	TCA
	3C	Fats and Proteins
	3D	OxPhosph
	3E	Photosynthesis
4	Other metabolism	Methanogenesis, chemolithotrophy

Calendar, Spring 2019

Day	Date	Time	Room	Hours	Topic	Notes
F	1/11	8:00-9:00 AM	Widt 333	1	Module 1	
F	1/11	3:00-5:00 PM	ML151	3	Module 2	
F	1/18	8:00-9:00	Widt 333	4	“	
F	1/18	3:00-5:00	ML151	6	Module 3	Exam 1 scheduled outside of class
F	1/25	8:00-9:00	Widt 333	7	“	
F	1/25	3:00-5:00	ML151	9	“	
F	2/1	8:00-9:00	Widt 333	10	“	
F	2/1	3:00-5:00	ML151	12	Module 4	Exam 2 scheduled outside of class