Syllabus
Bio444/Chem444 – Biochemistry – Spring 2008

Instructor: Jeffrey D. Newman **Room**: Heim 107 **Phone**: 570-321-4386 **email**: newman@lycoming.edu **office hours**: Tues. 3:30-4:30 PM Fri. 3:30-4:30 PM	**Instructor**: Chriss McDonald **Room**: Heim 233 **Phone**: 570-321-4186 **email**: mcdonald@lycoming.edu **office hours**: I'm almost always around from 8:15 – 5:00

Lecture meets MF 2:00 –3:15 PM in Heim G-40
Lab meets Wed. 2:00 – 4:50 PM in Heim 106
Course Web Site: http://moodle.lycoming.edu/moodle/login/index.php
Text: Berg, Timoczko & Stryer, Biochemistry, 6th ed, 2007, WH Freeman Publishers.

Catalog Description of Course: Emphasis is given to the metabolism of carbohydrates, lipids, amino acids, proteins, and nucleic acids; integration of metabolism; and biochemical control mechanisms, including allosteric control, induction, repression, signal transduction as well as the various types of inhibitive control mechanisms.

Grades will be determined based on the following assessments:

Exams	3 x 100 pts = 300 pts
Final Exam	150 pts
Prep Papers	22 x 3 pts = 66 pts
Phosphatase Lab Report	50 pts
Lipid Analysis Lab Report	50 pts
Metabolic Reconstruction	50 pts
Homework	49 pts
Quizzes	4 x 15 pts = 60 pts
Total possible	775 pts

Attending Chemistry colloquium will earn 3 bonus points, with a maximum of 15 bonus points permitted

	B+ = 86.7 - 89.9%	C+ = 76.7 – 79.9%	D+ = 66.7 - 69.9%	
A = 93.3 – 100%	B = 83.3 – 86.6%	C = 73.3 – 76.6%	D = 63.3 – 66.6%	F= below 60%
A- = 90.0 – 93.2%	B- = 80.0 – 83.2%	C- = 70.0 – 73.2%	D- = 60.0 – 63.2%	

Attendance Policy: Attendance of all lectures and laboratories is expected. Absences will be noted by the instructor, and if excessive (more than 1 lab or 4 lectures), may result in a reduction of the course grade. Absences and participation will be used to determine borderline (within 0.5%) grades. Documentation (note from school nurse, physician, documentation of job interview, etc.) for excused absences must be provided to the instructor as soon as possible.

Guidelines for Attending Chemistry Colloquium:

i. Be on time.

ii. The speaker has expended a lot of effort to prepare for the talk. Be attentive and polite.

iii. If you can't stay for 45 minutes for an internal speaker or 60 minutes for an external speaker, don't come (please do not ask the speaker how long the talk will last).

iv. Realize that questions for the speaker at the end is part of the talk and you will be expected to stay for that as well.

to encourage the use of writing to organize your thoughts about the course material, we will do "prep papers" for this class.

Daily "Prep Papers" are due at the beginning of each class.

Guidelines:

- Name and date should be indicated on top of page
- 1 paragraph summarizing key points from previous class and **asking questions in bold.**
- 1 paragraph summarizing key points from reading assignment and **asking questions in bold**.
- 0.5 – 1 page typed, Arial or Times Roman 12 pt font
- 2.5 cm (1 inch) margins
- **Each paper that meets guidelines earns 3 points**
- 66 points are built into the grading scale
    - If you do 22 prep papers, you score 100% on 66 point part of your grade
    - If you do 26 prep papers, you score 100% on 100 point part of your grade **and get 12 bonus points**
    - If you do 18 prep papers, you score 85% on 100 point part of your grade
- If prep papers are not done, a sign-in sheet will be available to confirm attendance
- Prep papers may be submitted for missed classes only when accompanied by a documented excuse (Note from Health Care Provider or coach).
- If a class is missed, the prep paper that is submitted upon return to class should summarize the last class attended and the reading assignment given on that day.

A Word About Learning Biochemistry. Studying biochemistry is hard work for most people (this is certainly true for us). We would recommend that you work on the lecture material outside of class for **at least** one hour per day, 7 days/week. Once you see how things are going this amount can be adjusted as needed (We suggest a significant increase in study time prior to an exam). If you are having trouble, make sure and come and talk to us. You will be responsible for all of the material listed on the following schedule for the indicated exams and quizzes. It is not sufficient to learn the material from the lecture alone. You are expected to read and think about the material prior to the lecture. We must necessarily cover a large amount of material so our pace must be geared towards those who are ready to learn. The exams will be somewhat cumulative in the sense that we need to know the earlier material to comprehend the latter.

Tentative Schedule

	Lecture Topics	**Lab Activities**
Week 1 1/7 – 1/11 ch. 1	M – Introduction, Bio concepts (JN) F – Chem concept review (CM)	**Pre-Test,** Metabolic Diversity of Life
Week 2 1/14 – 1/18 ch. 2, 6	M -Amino Acids (CM) F - Protein Structure (JN)	Protein structure and sequence analysis with Chime/Protein Explorer. (computer lab) (text ch 3.6)
Week 3 1/21 – 1/25 ch. 7, 8	**Quiz 1 (1/21)** M – Hemoglobin, Allostery (JN) F – Enzyme Kinetics (JN)	Measurement of phosphatase activity: Effect of enzyme concentration and pH.
Week 4 1/28 – 2/1 ch. 9,10	M – Enzyme Catalysis (CM) F – Enzyme Regulation (JN)	Phosphatase kinetic analysis: Effect of substrate concentration and inhibitors.
Week 5 2/4 – 2/8 ch. 12	M – Catch-up, review for exam F - Lipids (CM)	**Exam 1 (2/6)**
Week 6 2/11 – 2/15 ch.12,13	M – Membranes (JN) F – Membrane Transport (JN)	**Enzyme lab report due 2/13** GC/MS analysis of membrane lipids: Extract, transesterify to form methyl esters.
Week 7 2/18 – 2/22 ch 14	**Quiz 2 (2/18)** M - Signal Transduction (JN) F – Signal Transduction (JN)	GC/MS analysis of membrane lipids. Load samples, analyze data.
Week 8 3/3 – 3/7 ch 11, 15	M - Carbohydrates (CM) F – Metabolism concepts (CM)	**Exam 2 (3/5)**
Week 9 3/10 – 3/14 ch 16, 21	M - Glycolysis&Gluconeogenesis (CM) F - Glycogen Metabolism (JN)	SDS-PAGE analysis of bacterial protein extracts **Lipid Analysis Lab report due 3/12**
Week 10 3/17 – 3/19 ch 20	**Quiz 3 (3/17)** Calvin Cycle & Pentose Phosphate pathway (JN) **Fri – Good Friday**	Western Blot
Week 11 3/24 – 3/28 ch 17	M – Catch-up, review for exam F – Citric Acid Cycle (JN)	**Exam 3 (3/26)**
Week 12 3/31 – 4/4 ch. 18,22	M – Electron Transport (JN) F - Lipid Catabolism (CM)	Metabolic Reconstruction from Genomic DNA Sequences
Week 13 4/7 – 4/11 ch. 22, 23	M - Lipid Synthesis (CM) F - Amino Acid Catabolism. (JN) **Quiz 4 (4/11)**	Metabolic Reconstruction from Genomic DNA Sequences
Week 14 4/14 – 4/18 ch 24, 27	M – Amino Acid Synthesis (JN) F - Integration of Metabolism (JN)	Biochemistry Journal Club