

American University of Beirut
Faculty of Arts and Sciences
Department of Biology
BIOL 220 Introductory Biochemistry
Spring Semester 2010 - 2011

Instructors	Elias Baydoun	Colin Smith
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Office hours	To be announced	WHF 4-5pm

Meeting Time: TTh 09:30 - 10:45 am or TTh 11:00 am - 12:15 pm

Place: Biology Bldg Room 004

Catalogue Entry

BIOL 220 Introductory Biochemistry 3.0; 3 cr.

An introduction to the structure-function relationships of biomolecules, cells, enzymes, and the metabolic reactions of living cells. *Prerequisite BIOL 202; Pre- or corequisite: CHEM 211. Each semester*

1. Course Learning Outcomes

Students successfully completing the course will be able to:

1. Integrate their knowledge of chemistry and biology into a biochemical framework explaining cellular life. BIOL BS PLO 2a
2. Recognize major biochemical compounds by structure. BIOL BS PLO 3a
3. Describe the chemical properties of amino acids and proteins, carbohydrates, lipids, and nucleotides. BIOL BS PLO 3a
4. Understand and use biochemical principles, terminology, nomenclature, conventions, and codes. BIOL BS PLO 2a
5. Explain enzyme catalysis, kinetics, regulation, and inhibition, as well as the role of coenzymes. BIOL BS PLO 4b
6. Describe the central metabolic pathways of amino acids, carbohydrates, lipids, and nucleotides. BIOL BS PLO 4b
7. Describe bioenergetics and the coupling of electron transport to ATP synthesis. BIOL BS PLO 4b
8. Describe different metabolic regulatory mechanisms. BIOL BS PLO 4b
9. Describe the use and importance of biochemical methods. BIOL BS PLO 5b

2. Resources Available to Students

Textbook

Horton, H., Moran, L., Scrimgeour, K., Perry, M. and Rawn, J. 2006. *Principles of Biochemistry*, 4th ed. Pearson Education, Inc.

The textbook has a companion website at <http://www.prenhall.com/horton>

Other Resources

Nelson, D. and Cox, M. 2008. *Lehninger Principles of Biochemistry*. 5th ed. W. H. Freeman

Voet, D., Voet, J. and Pratt, C. 2008. *Principles of Biochemistry*. 3rd ed. John Wiley & Sons, Inc.

3. Grading Criteria

Smith: the better of **either** Smith mid-term 35%+ Smith Final 10%+ Smith Assignments 5% **or** Smith mid-term 15%+ Smith Final 25%+ Smith Assignments 10%

Baydoun: Baydoun Final 50%

Topic	Lecture	Horton Chapters
Introduction	Baydoun&Smith	
Introduction to Biochemistry	Smith	1
Water	Smith	2
Amino Acids and the Primary Structures of Proteins	Smith	3
Proteins: Three-Dimensional Structure and Function	Smith	4
Properties of Enzymes	Smith	5
Mechanisms of Enzymes	Smith	6
Coenzymes and Vitamins	Smith	7
Carbohydrates	Smith	8
Lipids and Membranes	Smith	9
Smith mid-term exam: 12:00 noon-3:00 pm Saturday 9 April 2011		
Metabolism: Basic concepts and principles	Baydoun	10
Carbohydrate metabolism:	Baydoun	11-14
Glycolysis	Baydoun	11
The citric acid cycle	Baydoun	13
Electron transport and ATP synthesis	Baydoun	14
Pentose phosphate pathway	Baydoun	12
Gluconeogenesis	Baydoun	12
The glyoxylate cycle	Baydoun	13
Glycogen metabolism	Baydoun	12
Lipid metabolism	Baydoun	16
Amino acid metabolism	Baydoun	17
Nucleotide metabolism	Baydoun	18
Final Exam To be announced		

* Nucleic acids are covered in BIOL 223, a required course.

** Photosynthesis and nitrogen and sulfur metabolism are covered in Biol 270, a semi-required course.

Smith recommended homework, subject to updates during the semester (you should be able to do, and you may expect exam questions similar to):

2: 1-8, 10-16; **3:** 1-10, 14-17 (recognize 20 amino acids and know their names, three-letter codes, single-letter codes, and pKas); **4:** 1-3, 5-16; **5:** 1-16; **6:** 1-13; **7:** 3, 4, 8; **8:** 2, 5, 7, 8, 9, 11; **9:** 1-13