

Advanced Biochemistry: Photosynthesis, Biosynthesis and Degradation of Biomolecules
Fairbanks Campus

Credits: 3

Instructor: Lawrence K. Duffy, 246 WRRB , lkduffy@alaska.edu, 474-7525

Office Hours: Tuesday and Thursdays following lectures. However, students are encouraged to contact the instructor by phone or email at any time

Lecture:

Prerequisites: CHEM 351

Required Textbook:

Biochemistry Concepts and Connections

Dean R Appling, Spencer J Anthony-Cahill and Christopher K. Mathews

Pearson

ISBN-13: 978-0321839923

Course Description:

This course will discuss the coordinating biochemistry components of metabolism and its pathways. Topics addressed include protein, lipid, carbohydrate and amino acid metabolism and biochemistry. The molecular basis of disease and aging are discussed as well as the One Health Concept. The connectivity of anabolism and catabolism is the theme of the course.

Course Goals:

- Develop an overview of the biochemical basis of biosynthesis and underlying regulation of enzymes and receptors.
- Ability to explain the molecular basis of disease and cellular signaling.
- Ability to explain the relationships of disease to environmental health and animal health.

Learning Outcomes

1. Understand biosynthetic relationships of amino acids, lipids and carbohydrates.
2. Comprehend the coordination of metabolic pathways, both biosynthetic and degradative.
3. Discuss biomedical/disease-related aspects of biochemistry.

Instructional Methods:

The teaching methods employed in this course will consist of lectures by the Instructor. It is imperative that reading of sections is done according to the lectures. Occasional case studies will be discussed.

Grading/Evaluation

Exams: There will be 4 term exams (100 points each) and a final exam (100 points).

Participation: *Class participation* in the form of discussion will be included in the final grade as extra credit. This entails attendance and active involvement in the regular lecture materials discussed.

The overall grade will be based upon a total of 400 points.

Term Exam I	100 Points
Term Exam II	100 Points
Term Exam III	100 Points
Term Exam IV	100 Points
Final Exam	100 Points
Subtotal	500 Points

Final Grades: This course will use the plus and minus system (such as A+, A-) and an absolute system (A+ = 97 or above, A = 90 or above, A- = 89 or above, etc.)

Course Policies

Attendance: Regular student attendance is expected to ensure consistent group activities and discussions.

Exams: Four exams will be given. These exams will be a combination of multiple choice/short answer and essay questions (take home or in class). Makeup exams will only be allowed with pre-approval of the instructor or with an acceptable, documented reason such as unexpected illness, family emergencies or other unavoidable events. A final exam is required.

Participation: Class participation entails an active interest aside from paper discussion/presentations. This includes but is not limited to answering questions during lectures, asking for clarifications, or contributing to ad hoc discussions.

Ethical Considerations: The Chemistry "Department Policy on Cheating" is as follows: *"Any student caught cheating will be assigned a course grade of F. The student's academic advisor will be notified of this failing grade and the student will not be allowed to drop the course."*

Plagiarism Policy

Plagiarism is defined as the use of "other" intellectual property without proper reference to the original author.

Intellectual property includes all electronic (Internet), spoken or print media. Students are expected to cite all sources used in oral and written presentations. Cases of plagiarism will be taken seriously with a grade 0 for the particular assignment. Severe cases may be referred to the Department Chair or Dean or class failing considered.

Support Services

Support services will be provided by the University of Alaska Library system, online resources and the instructor. Additional services are available through Student Support Services (<http://www.uaf.edu/sssp/>) at UAF.

Disabilities Services

Students with a physical or learning disability are required to identify themselves to the Office of Disabilities Services (203 WHIT, 474-7043) located in the Center for Health and Counseling in order to receive special accommodations. The

CHEM 493
Spring 2019

Lawrence K. Duffy

student must provide documentation of the disability. Disability Services will then notify me of special arrangements for taking tests, working homework assignments, and doing lab work.

See academic calendar or the UAF website for Final Exam and other important dates. See page 4 for additional Board of Regents' policy summaries.

Lecture	Chapter	Topic
1	Chapter 15	Photosynthesis
2	Chapter 15	Chloroplast
3	Chapter 15	Light Reactions
4	Chapter 15	Carbon Cycle
5	Chapter 15	C ₄ Cycle
6/7	Chapter 16	Lipid Transport
8/9	Chapter 16	Fatty Acid Oxidation
10	Chapter 16	Fatty Acid Biosynthesis
11	Chapter 16	Phospholipids
12	Chapter 16	Sphingolipids
13	Chapter 16	Steroids
14	Chapter 16	Eicosanoids
15	Chapter 17	Major Organs
16/17	Chapter 17	Hormonal Regulation
18/19	Chapter 17	Starvation
20	Chapter 17	Diabetes
21/22	Chapter 18	Nitrogen Cycle
23	Chapter 18	Ammonia Biogenesis
24/25	Chapter 18	Protein Turnover
26	Chapter 18	Co-enzymes
27/28	Chapter 18	Amino Acid Degradation
29/30	Chapter 18	Amino Acid Biosynthesis
31/32	Chapter 18	Biosynthetic Precursors
33		Final Exams see UAF website for date and time

University of Alaska Board of Regents have clearly stated in BOR Policy that discrimination, harassment and violence will not be tolerated on any campus of the University of Alaska. If you believe you are experiencing discrimination or any form of harassment including sexual harassment/misconduct/assault, you are encouraged to report that behavior. If you report to a faculty member or any university employee, they must notify the UAF Title IX Coordinator about the basic facts of the incident. Your choices for reporting include: 1) You may access confidential counseling by contacting the UAF Health & Counseling Center at 907-474-7043; 2) You may access support and file a Title IX report by contacting the UAF Title IX Coordinator at 907-474-6600; 3) You may file a criminal complaint by contacting the University Police Department at 907-474-7721. uaf.edu/oeo/civil-rights/aa-eo/

Any UAF employee or volunteer who reasonably suspects or observes Minor abuse or maltreatment is required to report the incident. Reporting procedures are available on the UAF Protection of Minors. Violation of this policy by employees shall be reported as well.

UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: alaska.edu/nondiscrimination.

Your instructor follows the University of Alaska Fairbanks Incomplete Grade Policy: "The letter "I" (Incomplete) is a temporary grade used to indicate that the student has satisfactorily completed (C or better) the majority of work in a course but for personal reasons beyond the student's control, such as sickness, he or she has not been able to complete the course during the regular semester. Negligence or indifference are not acceptable reasons for an "I" grade." Publicize UAF regulations with regard to the grades of "C" and below as applicable to this course. (Not required in the syllabus, but is a convenient way to publicize this.) PDF summary of grading policy for "C"

Effective communication: Students who have difficulties with oral presentations and/or writing are strongly encouraged to get help from the UAF Department of Communication's Speaking Center (907-474-5470, speak@uaf.edu) and the UAF English's Department's Writing Center (907-474-5314, Gruening 8th floor), and or CTC's Learning Center (604 Barnette st, 907-455-2860).

Veteran and Military Support Services: UAF is committed to all veterans and military students-active duty, reserve, guard, separated and retired-as well as their dependents who are exploring UAF's academic opportunities. Staff members in Financial Aid, Admissions, Career Services, Veterans' Services and the Veterans' Resource Center are here to help you with any challenges you encounter while working while in or transitioning from a military to an academic environment. Please contact the Veterans Resources Center, 907-474-2475, uaf.edu/veterans/ in room 111 in the Eielson Building.