

BIO 446G – BIOCHEMISTRY
Western Kentucky University-Owensboro
Syllabus and Course Information Sheet
Winter 2020

INSTRUCTOR: Dr. Chandra Emani
Associate Professor
Office: KTH3030; Lab: EBS 3123, Phone: 270-745-2104

Class Schedule:

Lectures: Monday through Friday (Videos posted on Web-Blackboard Course site)

E-mail: chandrankanth.emani@wku.edu

WELCOME TO BIO 446

Congratulations to you all for joining the Western Kentucky University academic family and a warm welcome to our Biochemistry community. This course will strengthen the foundation of the basic concepts of biochemistry, specifically the concepts and scientific basis of THE CHEMISTRY OF LIFE.

As in all my classes I will adopt the teaching methodology of “deep learning,” a process where the student learns with understanding as opposed to rote or surface learning where he/she just collects innumerable unrelated facts. I excitedly look forward to introducing you to THE WORLD OF LIFE’S CHEMICAL PROCESSES interspersed with episodic historical anecdotes, real world examples on HOW WE CAN UNDERSTAND LIFE through its CHEMICALS. The rest of the course information sheet will help you to understand the objectives we will achieve through this course, the methods used to measure and gauge your progress throughout the course, and the WKU academic policies and rules.

COURSE DESCRIPTION AND OBJECTIVES

Biology 446G course will introduce you to the study of biochemical compounds and their role in intermediary metabolism. Special topics include biochemical energetics and coenzyme mechanisms. Focus will also be on the aspects of the field of molecular biology. The objectives of the course are:

1. Exposition of the role of biomolecules including carbohydrates, lipids, nucleic acids and proteins in shaping life on earth
2. A thorough analysis of the various steps involved in metabolic pathways of life such as glycolysis, photosynthesis, nitrogen and nucleic acid metabolism, and protein synthesis
3. A comprehensive study of the structural and functional aspects of DNA, RNA and proteins and their role as the central dogma of life

STUDENT LEARNING OUTCOMES

After successfully completing Bio446G, the student will have a comprehensive knowledge of:

1. Structural and functional aspects of biomolecules in origins and maintenance of life on earth
2. Applications involving the biochemical and recombinant DNA in advanced biological research
3. Scientific writing and presentation in the fields of biochemistry and molecular biology.

EXPANDED COURSE DESCRIPTION

Please refer to the lecture schedule at the end of this document

REQUIRED TEXTBOOK

Biochemistry: A short course By John L. Tymoczko, Jeremy M. Berg and Lubert Stryer
Third Edition, 2015, W.H. Freeman and Company, ISBN:1-4641-2613-5

CLASS POLICIES

Attendance: WKU believes that regular class attendance is a crucial component for student success. Every class lecture is a vital foundation for subsequent class meetings. Without full participation and regular class attendance, students will be at a severe disadvantage for achieving success at college. Class participation (including exams and assignments) is vital to understand the subject matter in a thorough manner. It is my responsibility as a faculty member, to determine how participation is achieved in all my classes. I will require students to regularly attend class by logging into blackboard course website and will keep a record of attendance (in the form of discussion forums posted periodically) from the first day of class and/or the first day the student's name appears on the roster through final examinations. When a student has 5 days unexcused absences (absence of postings in the blackboard site), I will record the student's unexcused absences. The student will receive an emailed warning from me that upon one more day of unexcused absence, the student will be dropped from all classes in which the unexcused absences are reported. Some of the forms of absence that can be considered officially excused are: (1) Sick and medical emergencies (2) Representing WKU/the student's enrolled institution at an official institutional function. Other excuses will be considered, at my discretion, with documentation.

Dropping: If a student chooses to drop the course, it is that student's responsibility to ensure proper documentation with WKU. Failure to do so could result in a grade of F in the course. If you wish to withdraw from the course you should do so by the dates mandated by the University. Be sure you are aware of these dates because credit for the course will not be changed after the university's designated time. You also cannot drop the class or Withdraw after the designated time.

Disabilities: Students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Office for Student Disability Services at (270) 745-5004. Please DO NOT request accommodations directly from the professor or instructor without a letter of accommodation from the Office for Student Disability Services.

Dishonesty Statement: WKU does not tolerate cheating, plagiarism or other acts of dishonesty. Definitions of these acts and procedures for dealing with them are described in the WKU standards of professional conduct on the university website and in the student handbook.

Civility Statement: Members of the WKU community, which includes faculty, staff and students, are expected to act responsibly in classroom even in a web environment. WKU holds all members accountable for their actions and words posted in the discussions. Therefore, all members should commit themselves to behave in a manner befitting a responsible College and Civilian community. Responsible College and Civil behavior applies to decent language and content posted in the discussion forums.

COURSE REQUIREMENTS AND CRITERIA FOR GRADING

Exams: There will be two exams (100 points each) and a final exam (100 points) during the course. The exams are open book format and will contain questions aimed at exploring your analytical abilities in presented case studies based on what you learned in lectures

Discussion forums: Periodic discussions will cover recent topics and assigned readings from the lectures.

Research assignments: These will be in the form of analytical case studies based on knowledge gained in class sessions for the week, and will be integrated into the daily discussion forums.

Point Distribution:

Exams (2 x 100 points each)	200 points
Final Exam	100 points
Research Assignments (3x100)	300 points
Discussions (4x25 points)	<u>100 points</u>
	700 points

LECTURE SCHEDULE

JANUARY 6– INTRODUCTION-WHAT'S IN IT FOR ME? (Chapter 1)

7 – Water and Proteins (Ch. 2-5)

8 – Enzymes (Ch. 6-9)

9 – Carbs, fats and membranes (Ch. 10-13) **Research Assignment 1**

10 – Exam 1

13 – Eating and Breathing (Ch 14-21)

14 – Photosynthesis (Ch. 22-23)

15 – Sugar and Fat metabolism (Ch. 24-29)

16 – Nitrogen metabolism (Ch. 30-32) **Research Assignment 2**

17 – Exam 2

20 – DNA and RNA (Ch. 33-36)

21 – Gene Expression (Ch. 37-38)

22 – Genetic code and protein synthesis (Ch. 39-40)

23 – Recombinant DNA technology (Ch. 41) **Research Assignment 3**

24 – FINAL