Introduction to Molecules and Life
CHEM 1011 (860:011)
Syllabus

MEET YOUR INSTRUCTOR

Dr. John A. Bumpus, Professor of Chemistry and Biochemistry

Dr. Bumpus is a Professor in the Department of Chemistry and Biochemistry at the University of Northern Iowa. His main research interests focus on how toxic and environmentally persistent organic pollutants are metabolized by fungi. Other research interests focus on water purification by titanium dioxide mediated photocatalytic oxidation. Another area of research centers on molecular modeling and computational characterization of high explosives. Dr. Bumpus' research and other academic endeavors have been funded by the National Institutes of Health, the National Science Foundation, the Department of Energy, the Air Force Office of Scientific Research and the Department of the Interior. He received the B.S. degree in Biology and the M.S. degree in Education from the State University of New York at Oswego, New York. He continued graduate school at Binghamton University where he received an M.A. in Biological Sciences. His Ph.D. degree in Biochemistry is from St. Louis University. Dr. Bumpus has held a variety of teaching and research positions at Lake Superior State University, Michigan State University, Utah State University, the University of Notre Dame and the University of Northern Iowa.

Required Textbook:

Essentials of General, Organic and Biochemistry by Guinn and Brewer.

COURSE OVERVIEW

The University of Northern Iowa course catalog states that this course will cover "Basic concepts of chemistry, with an emphasis on the structure and function of molecules in living systems". Indeed, this course will do this. Initially this course will survey selected topics of basic introductory chemistry and then organic chemistry. Enough of a foundation will be provided for subsequent discussion of the molecules of life and a survey of introductory biochemistry.

The chemistry of life is too important to be left solely to the chemists (and biochemists). In my view, everybody should have a conceptual appreciation of how life works and I am offering this course to share my interest and excitement in this topic by conveying this knowledge to others.

There are no chemistry prerequisites required for this course, only a willingness to learn.

COURSE ORGANIZATION

This course will be delivered over the World Wide Web, utilizing web pages, and a learning management system (**eLearning**). The course is organized into 12 Assignments (each containing an Online Assessment) and 5 proctored Exams.

Course Outline:

Measurement, Atoms and Elements and Compounds

Shapes of Molecules and their Interactions

Solids, Liquids and Gases and Solutions and Colloids

Hydrocarbons and Structure

Organic Functional Groups

Chemical Reactions Basics and Acids, Bases, pH and Buffers

Reactions of Organic Functional Groups in Biochemistry

Proteins: Structure and Function

Carbohydrates: Structure and Function

Lipids: Structure and Function

Metabolism and Bioenergetics

Nucleic Acids: DNA and RNA

Online Assessments:

Each Assignment consists of reading one or two chapters from the text and concludes with the completion of an Online Assessment.

Details regarding the Online Assessment are:

The Online Assessments are based on the readings and questions/problems at the end of each chapter.

You have **four hours** to complete each Online Assessment. You may complete up to three (3) attempts with each Online Assessment. The highest grade of the three attempts will be recorded in the Grade Book. After completing an attempt you will need to wait one (1) day before you may access another attempt.

You may use your book and notes while completing the Online Assessment. However, the examinations will be proctored and closed-book.

The Online Assessments are graded and will count as 50% of your final grade.

Need help? See the eLearning Tutorials for instructions on how to complete an Online Assessment.

Exams:

There will be five proctored exams. Exam request forms are included at the appropriate places in the **Course Content**. You have 90 minutes to complete each exam.

Each exam will consist of 75-100 questions. You will not have to answer every question. For example, the instructor might require that only 60 of 75 questions be answered. Specific instructions in this regard will be provided on each examination.

The questions may be short answer, multiple-choice or true/false

All examinations are closed-book.

GRADING

UNI Guided Independent Study requires that you submit all assignments and complete all exams to recieve a grade in the course. The Online Assessments will count as 50% of your final grade. The Exams are also 50% of your final grade.