

## CHEMISTRY 100: Organic and Biochemistry of Life

Term: Spring, 2007  
Prerequisites: None  
Class time: 9.00 a.m. - 9.50 a.m. Mondays, Wednesdays, and Fridays  
Class location: MARK 125  
Instructor: S. Jayasinghe (Jay), Ph.D.  
Inst. Office: Sci II, 229  
Inst. Office hours: Mondays and Wednesdays from 10:00 a.m. to 11:30 a.m. or by appointment  
Inst. Phone: (760) 750-8075  
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**Course Objective:** This course will cover the basic principles of general, organic, and biochemistry as needed to understand the biochemistry, physiology, and pharmacology of the human body. This course is intended for students pursuing a degree in nursing or kinesiology.

**Student Learning Outcomes:** Upon completion of this course students should:

- (1). Be able to demonstrate their knowledge of the principles of general chemistry and their applicability to the field of health care. Students should be able to: (a). recognize the difference between ionic and covalent compounds; (b). write the names and formulas of compounds commonly encountered in the field of health care; (c). define the various measures of concentration and should be able to correctly use them in calculations; (d). describe the concepts of pH, buffers, the difference between acids and bases, and be able to calculate the pH or the hydrogen ion concentration given relevant information; (e). describe the properties of gases, the relationships between gas pressure, volume, and temperature, and also be able to use them correctly in calculations; (f). correctly use significant figures in calculations.
- (2). Be able to demonstrate their knowledge of organic chemistry. Students should be able to: (a). recognize the most common organic functional groups; (b). describe how properties of functional groups dictate the chemical and physical properties of organic compounds (such as drugs, and biological macromolecules) encountered in the field of healthcare; (c). identify the classes of organic molecules that play important roles in human health.
- (3). Be able to demonstrate their knowledge of biochemistry with respect to the three biological macromolecules of carbohydrates, lipids and proteins. Students should be able to: (a). recognize and describe the chemical and physical properties of carbohydrates, lipids, and proteins; (b). describe the various biological functions of carbohydrates, lipids, and proteins.
- (4). Be able to demonstrate their ability combine their knowledge of general, organic and biochemistry to describe and analyze relevant issues in the field of health care.

In addition to these learning outcomes I will provide you, at the beginning of each new chapter (or section), a set of goals that you should use as a guide to learn the information in the chapter under discussion. Use these goals to help you study for the quizzes and examinations.

**Textbook (Required):** "Chemistry: An introduction to General Organic, and Biological Chemistry", 9th Ed., K. Timberlake, Pearson/Benjamin Cummings Publishing, 2006.

**Texts on Reserve:** "Conceptual Chemistry", 3<sup>rd</sup> Ed., John Suchocki, Pearson/Benjamin Cummings Publishing, 2006.

Three copies of this book are on reserve at the library. We will use two chapters from this book.

**Lecture Notes:** PDF files of the slides that I use during the lecture are available online via the campus webCT system. It is highly suggested that you print a copy of these files and bring it to class with you.

**Topic Schedule:** Unless otherwise noted all chapters refer to the course textbook by Timberlake. This is the lecture schedule for CHEM 100 for the Spring semester of 2007. Although every attempt will be made to adhere to this schedule I reserve the right to adjust the time spent on each topic as the semester progresses. **Read the relevant chapters in the textbook before the lecture.**

Chapter 1.	Measurements Sections 1.1 – 1.7 Section 2.3
Chapter 3.	Atoms and Elements Sections 3.1 – 3.8
Chapter 4.	Compounds and their Bonds Sections 4.1 – 4.7
Chapter 5.	Chemical Reactions and Quantities Sections 5.5 and 5.6
Chapter 6.	Gases Sections 6.1 – 6.8
Chapter 7.	Solutions Sections 7.1 – 7.5 and 7.7
Chapter 8.	Acids and Bases Sections 8.1 – 8.7

*From "Conceptual Chemistry"*

*Chapter 12*                      *Organic Compounds*  
*Sections 12.1 – 12.3*

Also from Timberlake  
Chapter 10

Introduction to Alkanes  
Sections 10.1. – 10.5

Chapter 11

Unsaturated Hydrocarbons  
Sections 11.1 – 11.5

Chapter 12.

Organic Compounds with  
Oxygen and Sulfur  
Sections 12.1 – 12.6

Chapter 13.

Carboxylic acids, Esters,  
Amines, and Amides  
Sections 13.1 – 13.5

Chapter 14.                      Carbohydrates

	Sections 14.1 – 14.6
Chapter 18	Metabolic Pathways and Energy Production Sections 18.2 and 18.4
Chapter 15.	Lipids Sections 15.1 – 15.7
Chapter 18	Metabolic Pathways and Energy Production Sections 18.8
Chapter 16.	Amino acids, Proteins, and Enzymes\ Sections 16.1 – 16.9
Chapter 18	Metabolic Pathways and Energy Production Sections 18.9

*From "Conceptual Chemistry"*  
*Chapter 14                      The Chemistry of Drugs*  
*Sections 14.1 – 14.8*

**Course web site:** [www.csusm.edu/jayasinghe/Classes/CHEM100/CHEM100.html](http://www.csusm.edu/jayasinghe/Classes/CHEM100/CHEM100.html)

**Exams:** There will be four (4) mid-semester exams and a final examination. The four mid-semester exams are scheduled as follows:

- 1<sup>st</sup> mid-semester exam – Monday, February 12, 2007
- 2<sup>nd</sup> mid-semester exam – Wednesday, March 07, 2007
- 3<sup>rd</sup> mid-semester exam - Wednesday, April 11, 2007
- 4<sup>th</sup> mid-semester exam – Wednesday, May 02, 2007

**The final examination is comprehensive, and is scheduled for, Wednesday May 16, 2007 from 7:00 a.m. to 9:00 a.m.**

Make up examinations will only be given if the student has a valid excuse (severe illness, death in the family, etc.) and notifies the instructor prior to test time (if possible). No make-up examination will be given unless the instructor is notified of the emergency within two (2) days of the test.

Exams will contain multiple choice, short answer, and essay type questions.

**Exams (Continued):** Each mid semester exam will have both an in-class component as well as a take-home component. 80% of each exam grade will be in-class while the remaining 20% will be take-home.

The take-home portion of each mid term exam will only contain essay type questions (typically one or two). To complete the take-home portion of the exam you may work in groups and use any textbook or reputable reference material. **Although you are allowed to work in groups, all submitted work must be your own and must be written in your own words.**

Take-home portions of the exam will be provided to your one-week prior to the date of the exam (listed above). Completed work is due on the day of the exam. **No extensions will be given.**

The final examination does not contain a take home component.

**Quizzes:** There will be 10 quizzes (roughly every Wednesday, except on those weeks in which a mid term exam has been scheduled) beginning the second week of class (the week of 1/31/07). Quizzes will be administered during the first 15 minutes of class. Each student may drop two (2) quizzes at the end of the semester. A missed quiz will be counted as one dropped quiz. After two (2) dropped quizzes any additional missed quiz will receive zero points. **No make up quizzes will be given.**

**Homework:** A set of homework problems, for each of the chapters that will be covered during the semester, will be available via the course website. Five (5) times during the semester selected problems from this set will be collected and graded. **These are to be handed in at the beginning of the next class period. No Extensions will be given.** Since you do not know which problems I will collect it is in your best interest to do all the assigned problems. **Doing these homework problems is also a good way to study for the quizzes and exams.**

**Grading (points):**

8 quizzes (15 points each)	120	24%
4 Mid-semester examinations (60 points each)	240	48%
Final Examination	100	20%
Homework	40	8%
Total	500	100%

**Letter grades:** Letter grades will be assigned based on the following cutoff values:

Percentage	Grade
90% and above	A
88 – 89.9%	B+
82.1 – 87.9%	B
80 – 82%	B-
78 – 79.9%	C+
72.1 – 77.9%	C
70 – 72%	C-
68 – 69.9%	D+
62.1 – 67.9%	D
60 – 62%	D-
59.9% and below	F

**Writing Requirement:** The University Writing Requirement will be satisfied by quiz and examination questions requiring written answers.

**Students with Disabilities:** Students with disabilities who require accommodation must be approved by the Office of Disabled Student Services (DSS). Please contact this office as soon as possible and should meet with the instructor during office hours (or at some other mutually agreeable time). The DSS office is located in Craven hall 5205. Their telephone number is (760) 750-4905 or TTY (760) 750-4909.

Academic Honesty:

All students are expected to maintain academic honesty. This is especially true with regards to take home exams and homework. **All submitted work must be your own and must be written in your own words.**

All students should be familiar with the university policies and procedures concerning academic honesty as detailed in the university catalog. An online version of these policies and procedures can also be found at:

[http://lynx.csusm.edu/policies/procedure\\_online.asp?ID=187](http://lynx.csusm.edu/policies/procedure_online.asp?ID=187)

HOW TO STUDY CHEMISTRY IN ORDER TO EARN A GRADE OF A, B, OR C.

1. **Take good lecture notes.** You are responsible for everything that I write or project on the board (except videos). Make use of the PDF files of my slides (see above) to reduce the amount of writing you have to do in class.
2. Make flash cards of definitions, concepts, reactions, structures, and nomenclature that are covered in lecture notes.
3. Use your lecture notes/flash cards as a guide to your **reading in the textbook**. Read the relevant chapter (or chapter section) before coming to the lecture and after attending the lecture (yes, twice).
4. **Solve the homework problems.** Some of the answers are in the back of the textbook. One of the best ways of learning is to find a study partner or to form a study group and work on the problems together. Doing the homework problems is how you develop the analytical/critical thinking skills to do well on the quizzes and final exam.
5. **Attend class.**
6. **If you have questions, ask.** Make use of the instructors office hours.