Chem 1107. CHEMISTRY FOR HEALTH SCIENCES

Spring 2012

COURSE INFORMATION

Co-requisite: Chemistry for Health Sciences, Lab 1117
Class Meeting Time: M, W, 12 - 1\textsuperscript{15}
Classroom: Dickinson Hall, lecture hall 1153

Instructor Information

Instructor: Dr. Anna Debska-Chwaja
Office: Dickinson Hall, room 4418
Office Hours: by appointment and via e-mail
Phone Number: (201) 692 2330
Email: debskan@fdu.edu

Course Description

This course offers a comprehensive introduction to general chemistry, organic chemistry, and biochemistry, with examples taken from health sciences with human focus. It is a 4-credit course and includes a lab. This course will be of interest to students majoring in health sciences, and to others wishing to learn the relevance of chemistry to human health.

Course Objectives

Material covered is divided into three main parts: general chemistry, organic chemistry and biochemistry.

**General Chemistry** - will introduce students to the scientific method, measurements and unit conversion, chemical and physical principles, basic study of atomic structure, chemical formulas, equations, chemical reactions, periodicity, chemical bonding theory of ionic and covalent bonds, gas laws, solutions, and the related nomenclature of each topic.

**Organic Chemistry** - includes an introduction to the properties and reactions of carbon compounds. Nomenclature of organic compounds, functional groups, structure, key reactions, chemical bonding in organic compounds and properties will be studied.

**Biochemistry** - covers basic chemistry of carbohydrates, lipids, amino acids and proteins, an introduction to enzyme kinetics and inhibition, an introduction to the chemistry of nucleic acids and DNA sequencing, some information on genetic engineering, chemical communication, immunity, and the fluids of the human body.
Expected Outcomes of the Course

After finishing this course, students will:

- possess a basic knowledge of the studied areas of chemistry (at an introductory level);
- know principles, laws, nomenclature, functional groups, key reactions and the role of studied chemical compounds in living organisms;
- be able to read and evaluate professional scientific literature on an introductory level;
- be able to write and communicate science;
- be able to readily utilize the metric system;
- be able to use mathematical reasoning in solving chemical problems;
- understand and apply scientific methods in their reasoning.

Electronic Forms of Communication

I will use your FDU email address to communicate with you regarding all course-related matters. Please monitor your FDU e-mail daily for important information regarding this class.

Texts, Readings & Materials

Textbook:

Handouts:
Handouts will be sent electronically or will be given at the beginning of the class with the outline covering the day’s topics, the assigned reading and homework. Occasionally other reading outside the textbook will be required; sometimes it will be on the web, sometimes in a journal article provided by the instructor.

COURSE REQUIREMENTS

Class Preparation Policy

Reading:
I request that you read the assigned material from the textbook, and occasionally other sources as directed.

Homework:
It will be based on topics discussed in class and will be from the textbook, or sometimes from another source provided by the instructor.

Students are required to keep a homework folder that includes all assignements. Homeworks will be given in class or sent electronically; the folder should be kept up to date so that it may be reviewed by me when required.
Homework will be collected on the Monday or Wednesday following the week it was assigned. Late homework will not be accepted. Homework makes up part of the final grade.

**Quizzes**

During the semester, your academic performance will be monitored by short and unexpected quizzes. The results will be taken into consideration during grading, at my discretion. I can increase or decrease your grade accordingly.

**Extra credits**

You can earn extra credits by:

- attending scientific seminars or conferences as indicated by the instructor and writing your reaction paper;
- writing a review of a technical paper provided by the instructor;
- writing a critique of a scientific film indicated by the instructor.

There will be a class presentation of work chosen by me. Extra credits for each assignment: 0-2, but no more than 6 all together. I am aware that some of my students attend more seminars and read more papers than others, and although I do not give additional credits for exceeding minimum requirements, it speaks well for the student and might offset some negativities during the semester; however, 6 extra credits is a maximum. The extra credits will be added to your final grade.

**Exams**

There will be three multiple-choice in-class exams. Students who scored more than 80% on Exam I and Exam II and are happy with the grade can skip these sections for the final exam.

**Laboratory**

The Lab grade is a part of a final grade. For the detailed description of the lab grading policy please see the syllabus for “Chemistry for health sciences-lab”.

**Calculators**

The use of a calculator is encouraged in the class. A simple scientific calculator is sufficient for this course.

**Attendance Policy**

Regular class attendance is required and makes part of a final grade. Each time you attend the class, please sign the official attendance sheet.
In the exceptional case, when you have to miss the class (for example an illness or family emergency), please provide me with a documented reason so that I can excuse your absence and not lower your grade.

**Grading Policy**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Final Exam</td>
<td>20%</td>
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<tr>
<td>Exam I</td>
<td>15%</td>
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<tr>
<td>Exam II</td>
<td>15%</td>
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<tr>
<td>Lab</td>
<td>35%</td>
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<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>Attendance</td>
<td>5%</td>
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**Grade Distribution**

The course will not be graded on a curve.

**Letter Grades**

- > 90.0 A
- 87.0 - 89.9 A-
- 84.0 - 86.9 B+
- 81.0 - 83.9 B
- 78.0 - 80.9 B-
- 74.0 - 77.9 C+
- 70.0 - 73.9 C
- 65.0 - 69.9 C-
- 60.0 - 64.9 D

**Religious Observances**

Students must inform their instructor during the first week of classes if they will miss the lecture because it coincides with a religious observance. Student is obliged to get the outline for the missed class and do all that was assigned that day.

**Policy on Academic Integrity**

Students are expected to read and understand the FDU Academic Integrity Policy, which can be found on-line. Members of the FDU community are expected to be honest and forthright in their academic endeavors.

**Students with Disabilities**

If you have a documented disability, please talk to me or send me an email.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1.</td>
<td>Introduction. The scientific method. Exponential notation. Matter, energy, heat, Measurements and unit conversions, Density and specific gravity, Hypothermia, hyperthermia and cold compresses.</td>
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9. Exam II.
   Carbohydrates.
   Blood groups. Galactosemia. Chiral drugs.

10. Lipids.
    Rancidity. Soaps and detergents. Multiple sclerosis.
    Cholesterol and heart attacks. Lipid storage diseases.
    Anabolic steroids. Anti-inflammatory drugs.

    Enzymes.
    Sulfa drugs. Penicillin. Heavy metal poisoning.

    Anticancer drugs. Viruses. AIDS. Mutations.
    DNA fingerprinting.

13. Chemical Communications.
    Nitric oxide and long-term memory.

    Review for the exam

15. Final Exam.