**CHEM 116**

**Introduction to Organic and Biochemistry**

**Fall 2013 Course Syllabus (4.0 units)**

1. **General Information**

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| Instructor: Martin Larter, M.S. | Sections: 2515 and 2516 |
| Office Number: 30-220 | Phone Number: 644-7346 |
| Email:[Martin.Larter@gcccd.edu](mailto:Martin.Larter@gcccd.edu) | **Room***: Lecture* Bldg 55, Room 523  *Lab* Bldg 30, Room 222 |
| Website: :<http://www.grossmont.edu/martinlarter> | Class Time Lecture:MW 5:30 PM – 6:45 PM |
| Office Hours: Mon & Wed 1-2 pm  Tues & Thurs 10 am - 12 pm | Class Time lab : Mon 7:00 PM – 10:00 PM (Sec 2515)  Wed 7:00 PM – 9:50 PM (Sec 2516) |
| Prerequisite: A "C" or "CR" grade or higher in CHEM 115 or equivalent. | |
| **Other office hours may be scheduled by appointment.**  **\*Always check 30-252 if I’m not in 30-220** | |

**II. SCOPE OF COURSE**

This course is designed to continue the formal chemical education of nursing students and allied health students who do not require a full year of organic chemistry for their pre-professional preparation. This course will focus on the nomenclature, physical properties and reactions of major functional groups essential to biochemistry and function of biomolecules, and the metabolism of proteins, lipids, nucleic acids and carbohydrates. The structure of organic molecules will be explored by the functional group approach so that the role of organic molecules in biological processes may be understood. The biochemistry will also be limited to that body of information and principles most pertinent to human physiological processes.

**III. TEXTBOOKS AND MATERIALS**

* **Text:** Introduction to Organic and Biochemistry, by Bettelheim,’ Brown and March, 7th edition.
* **Lab Book:** GC Chem. 116 lab notebook, available at the bookstore.
* **Homework:** Online Web-Based Learning (OWL) access code
* A 3-ring binder for taking and saving class notes.
* An ink pen for laboratory write-up (no writing of lab reports with pencil).
* Approved safety glasses or goggles (available in the book store).
* Fine Tip Black Sharpie pen

Note

* Calculators are generally not needed or allowed on quizes or exams
* (The Study Guide to accompany Bettelheim, Brown and March is useful but not required.)

**IV. Student Learning Outcomes**

Upon successful completion of this course CHEM 116 (Introductory Organic and Biochemistry), students will have the skills to

* + 1. Demonstrate a working knowledge of the language of organic and biochemistry.
    2. Employ the concept of organic functional groups to predict both chemical and physical properties of an organic molecule.
    3. Apply the concept of structure and function to predict properties of biomolecules.

**V. COURSE OBJECTIVES**

The general objectives of the course are:

* 1. To extend the elementary patterns of thought initiated in the introduction to chemistry to the study of organic and biochemistry;
  2. Learned to recognize the common organic functional groups and be able to apply the IUPAC rules for organic nomenclature
  3. Describe the major chemical, physical properties and reactions of the major classes of organic compounds.
  4. Become acquainted with how the stereochemistry of a molecule affects its reactions and properties
  5. Recognize and describe the structural features and characteristics of the four major classes of biochemical (carbohydrates, lipids, proteins an nucleic acids.)
  6. Understand the major metabolic pathways of carbohydrate and lipid catabolism and protein anabolism.

**VI. METHOD OF INSTRUCTION**

The course is taught by the lecture/demonstration method. The instructor relies heavily on student participation during the course of each lecture. This requires that students thoroughly review class notes between each class meeting and read the portions of the textbook pertinent to the topics scheduled for each session of the class. Plan to spend two hours per lecture hour and one hour per lab hour per week for studying, ***minimum.***

**VII. METHOD OF EVALUATION**

Each student’s grade in the course shall be determined by his/her performance on Exams, quizzes, online homework assignments, laboratory reports, poster project and a comprehensive final examination. Each student may accumulate a total of 1000 points. No make-up exams or quizzes shall be given unless arrangements are made in advance of foreseen absences or immediately following unforeseen absences due to documented sickness or family trauma.

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| Each activity shall be weighted as follows: | |  | The final course grade will be assigned utilizing the following scale: | |
| Activities | Points |  | Total Points | Course Grade |
| Exams (4) | 400 |  | 1000-900 | A |
| Quizzes (9-10) | 100 |  | 899-880 | A- |
| Online Homework/assignments | 100 |  | 879-800 | B |
| Laboratory Reports | 200 |  | 799-780 | B- |
| Poster Project | 100 |  | 779-760 | C+ |
| Final exam | 100 |  | 759-670 | C |
| Total | \_\_\_\_  1000 |  | 669-550  Below 549 | D  F |

Please note, however, that anyone on the borderline, but with test scores substandard to the higher grade, WILL NOT receive the higher grade. Less than a 55% average on the exams (including final), or on the labs will earn an F.

*Exams:*Students who come in late will not be given extra time on the exam. Exams will contain a variety of question formats, including short answer, fill in the blanks, matching, multiple choice, problems, etc. Make-up exams will only be given before the test or if the instructor prefers, in the time period between the exam date and the return of exams. All students *must* take the final examination, *at the scheduled time.* Your exams will **ALWAYS BE CUMULATIVE**

*Quizzes:*Quiz will be administered at the beginning of either the lecture or lab period on the week shown below. Students who come in late will not be given extra time.

*LabORATORY:* You are expected to read the experiment before coming to lab. **Students who come to lab with only a copy of the post lab questions or data sheet will not be permitted to perform the experiment.** You must hand in the pre lab quiz before lab begins (or receive a zero on that portion of the lab). The post lab questions will usually be due the next lab session, so it is a good idea to look over these questions the day before. There are no **make-up** laboratory experiments. No pre-lab, post-lab, or data sheets will be accepted from students who miss the lab period.

***Failure to obey the safety regulations in lab will result in a grade of*** ***zero for the labs involved.* You** **must** **pass the** **lab** **in** **order** **to** **pass** **the** **course.**

**Do not leave the laboratory without checking with the instructor (me). Your work space (hood, balances etc.) needs to be clean as well as the equipment you used. The content of your locker needs to be clean as you are sharing it. Chemicals need to be returned to their source space. Containers need to be capped. ~Lab needs to be left as found! ~**

Because of potential safety problems, children may not attend lab. This will include not being in the adjacent computer area while the parent is in lab. Also no lab work may be done without an instructor present in the laboratory.

*Homework / Assignments:*Homework will be assigned for each chapter covered. Homework collection and grading will be handled by the Online Web-Based Learning (OWL) System. A code must be purchased in order to access this system. Further instructions are given at the website: <http://owl.cengage.com>

Assignment will be given periodically in class along with its deadline. These assignment will be hand graded and will help provide feedback if you had understood the concepts being taught.

*Poster Project:* For this project you will work individually to complete a poster on the organic /biochemical molecule of your choice (your “pet molecule”). You will gather a variety of information on your molecule and present it to the class in the form of a poster. First, each person will give a brief verbal tour of the poster and answer any questions from their classmates, and then you will have free viewing time so students can spend more time looking at posters they find interesting.

**Basic Guidelines for Beginning your Research:**

1. The poster board should be about 3 ft tall x 4 ft wide (this will be provided on the day of the poster or you can supply your own poster board):

* Must include visual media (chemical structures, pictures, graphs etc.);
* Text must be large enough to read from a few feet away.

2. Information presented should include the following (if possible):

* IUPAC and common name for molecule;
* Molecular structure and chemical formula;
* Physical properties (color, physical state at STP, molar mass, density, melting and boiling points, solubility);
* Where molecule is found in nature;
* History (who discovered it and when, who determined structure, who first synthesized it, etc.);
* Synthesis (if applicable, how is your molecule synthesized?); show the synthetic scheme (reaction or reactions);
* Chemical reactivity (what reactions of interest does your molecule undergo, either in living systems, in the environment or in the laboratory?); Be sure to write out the reactions;
* Toxicology (How dangerous is this molecule, what is the side effects?);
* Information of interest (what is most interesting about your molecule, why did you select it?); the chemical reactivity and synthesis may be included in this section;
* Include a list of references (at least 3 sources other than your textbook and the other sources must not all are from the internet).

**VIII. Academic Policies**

***Attendance:*** Your attendance at all class meetings is expected. Any absence in the first two weeks of the semester will result in your being dropped from the course. Excessive absence **(more than 3 unexcused absences)** may also result in your being dropped from the course or receiving a failing grade. All absences will be considered unexcused until explain and appropriate documentation provided (from doctor, police etc…)

* Attendance will be taken at the beginning of each class period. If you arrive after this time, you must come by after class to change from being marked absent too late. **Being late for class three times will count as one absence.**
* If a regular class meeting is missed, it is the student's responsibility to obtain any assignments or instructions that were given by the instructor.

***Academic Integrity:*** Please be aware of the College's and the Chemistry Department's academic integrity policy. In particular, exam work and lab results are to be entirely your own. Penalties from a zero on an exam to expulsion are available.

Cheating” includes but is not necessarily limited to:

1. The possession or use of unauthorized materials such as crib notes or unauthorized copies of exam material.
2. Copying from another person’s quiz or allowing another person to copy one’s examination material.
3. Copying another person’s laboratory data and turning it in as one’s own or allowing another person to copy one’s data.
4. The possession or use of a personal communication device during exams or quizzes.

***Disruptive Behavior:*** Due to the intensity of the information in the lecture and laboratory classes, classroom disruptions will not be tolerated. In Grossmont classrooms and laboratories, **all cellular telephones and pagers must be turned off or switched to silent or vibrator mode**. Electronic entertainment devices are to be turned off and headphones removed. Students being disruptive will be asked to leave the class.

***Drop Procedure:*** After the first two weeks of the semester, students must assume responsibility if they wish to drop the course. Do not rely on the instructor to complete the paperwork if you decide to drop the course. If a student does not follow the drop procedure correctly, a final grade of F will be issued for the semester.

**Chemistry Tutoring:** Peer tutoring will be available in the Science Learning Center (30-252). Chemistry tutoring is also available on the second floor of the library. You can also come to the instructor’s office hour to get help on your chemistry.

**Supervised Tutoring Referral:** Students are referred to enroll in the following supervised tutoring courses if the service indicated will assist them in achieving or reinforcing the learning objectives of this course:

1. IDS 198, Supervised Tutoring to receive tutoring in general computer applications in the Tech Mall
2. English 198W, Supervised Tutoring for assistance in the English Writing Center (Room 70-119); and/or
3. IDS 198T, Supervised Tutoring to receive one-to-one tutoring in academic subjects in the Tutoring Center (Room 70-229, 619-644-7387).

To add any of these courses, students may obtain Add Codes at the Information/Registration Desk in the Tech Mall. All Supervised Tutoring courses are non-credit/non-fee.  However, when a student registers for a supervised tutoring course, and has no other classes, the student will be charged the usual health fee.

***Student Accessibility:*** Students with disabilities who may need accommodations in this class are encouraged to notify the instructor and contact Disabled Student Services & Programs (SDP&S) **early in the semester** so that reasonable accommodations may be implemented as soon as possible.  Students may contact DSP&S in person in room 11o or by phone at (619) 644-7112 (7119 is TTY for deaf).

**IX. IMPORTANT Dates**

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| Last to drop without receiving a “W” | August 30th, 2013 |
| Last day to apply for P/NP | September 20th , 2013 |
| Last day to drop a class | November 8th , 2013 |
| Holidays | **Labor Day : September 2**  **Veterans' Day: November 11**  **Thanksgiving: November 28, 29, 30** |

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**I reserve the right to make changes to the syllabus and schedule as I or the class see fit.**

Chemistry 116 – Fall 2013 Lecture/ Lab Schedule

**This is a tentative schedule. If there is any change in an Exam date, you will be informed in advance.**

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| **Week** | **Dates** | **Topics** | **Reading** | **Laboratory** |
| 1 | Aug 19th  Aug 21st | * Introduction * Alkanes | Chap 1,2 | Check-in  Exp 14: molecular models VSEPR worksheet |
| 2 | Aug 26th  Aug 28th | * Alkanes * Alkenes and Alkynes   Last “drop day without W” Aug 30th | Chap 2,3 | Quiz 1  Exp #1: molecular models |
| 3 | Sept 2nd  Sept 4th | Labor Day break   * Alkenes and Alkynes | Chap 3 | Wed: Exp #2 Properties of Hydrocarbons |
| 4 | Sept 9th  Sept 11th | * Aromatics * Alcohols, Ethers and Thiols **poster topic due** | Chap 4,5 | Mon: quiz 2 / Exp #2 Properties of Hydrocarbons  Wed: quiz 2/ exam review |
| 5 | Sept 16th  Sept 18th | * **Exam 1: Sept 16th**  **Ch 1,2,3,4** * Alcohols, Ethers and Thiols | Chap 5 | Exp #4 Alcohols |
| 6 | Sept 23rd  Sept 25th | * Aldehydes, Ketones | Chap 9 | quiz 3  Exp #5 Aldehydes and Ketones |
| 7 | Sept 30th  Oct 2nd | * Carboxylic Acids * Carboxylic Anhydrides,   Esters, and Amides | Chap 10 , 11 | quiz 4  Exp #6 Aspirin and carboxylic acids |
| 8 | Oct 7th  Oct 9th | * Amines * **Exam II: Oct 9th**   **Ch 5,9,10,11** | Chap 8 | Exp #7 Amines, amides and amino acids |
| 9 | Oct 14th  Oct 16th | * Chirality * Carbohydrates | Chap 6,12 | quiz 5  Exp #8 Carbohydrates |
| 10 | Oct 21st  Oct 23rd | * Carbohydrates * Lipids   **Expanded Outline due** | Chap 12, 13 | quiz 6  Exp: Why Does Lipstick Stick to Lips? Lecture Catch up |
| 11 | Oct 28th  Oct 30st | * Lipids * Proteins | Chap 13, 14 | quiz 7  Exp #11 Organic qualitative |
| 12 | Nov 4th  Nov 6th | * Proteins * **Exam III: Nov 4th**   **Ch 6,8,12,13**  (Last day to withdraw Nov 8th) | Chap 14 | Exp #3 Recrystalization |
| 13 | Nov 11th  Nov 13th | * Veterans’ Day break * Enzymes | Chap 15 | Wed: Exp12 : Investigating the Enzyme Activity of Catalase, |
| 14 | Nov 18th  Nov 20th | * Enzymes * Nucleotides   **Poster rough draft due** | Chap 15,17 | Mon: quiz 8 / Exp 12: Investigating the Enzyme Activity of Catalase,  Wed: quiz 8 /Exp 13: Extraction of Nucleic Acids from Strawberries/ lecture catch up |
| 15 | Nov 25th  Nov 27th | * Gene Expression * Metabolic Pathways | Chap 18, 19 | Mon: quiz 9 / Exp13: Extraction of Nucleic Acids from Strawberries/ lecture catch up  Wed: quiz 9/ exam review/ checkout |
| 16 | Dec 2nd  Dec 4th | * Metabolic Pathways * **Exam IV: Dec 4th**   **Ch 14,15,17,18** | Chap 19 | Poster Session |
| 17 | Dec 9th  Dec 16th | Review  Final exam 6:05 pm -8:05 pm |  | Mon: Checkout/ additional review |