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1136-TR-P-CRED-REG-CHEM-212-PR-66546-SPR2013

SYLLABUS

Survey of Organic & Biochemistry

Chem. 212-1 PR

Studio Class, Room #3170

Monday, Wednesday: 6:00 pm — 8:40 pm

Instructor: Ahmed A. Hakeem, Contact: Room 3628, Tel: 773-907-4076; E-mail: ahakeem@ccc.edu

Office Hours: Room #3628 M, W 3:00 pm – 6:00 pm
(By Appointment: 8:45 PM – 9:15 PM)
T, Th 9:30 AM – 11:00 PM
3:15 PM — 5:00 PM

Required Materials: **Text Book:** Introduction to Organic and Biochemistry by Bettelheim, Brown, Campbell, And Farrell (Following options available)

1. ISBN: 049501477X Short textbook (6th Ed.)
2. ISBN: 0495391166 Short textbook (7th Ed.) Online at www.cengagebrain.com
3. ISBN: 0495391166 Short textbook (7th Ed.)
4. ISBN: 0495011975 Full textbook (8th Ed.)
- 5. ISBN: 04950391123 Full textbook (9th Ed.) (Recommended)**
6. ISBN: 0495480169 Short textbook (8th Ed.) + Custom lab manual combination

Lab Manual: Laboratory Experiments for General, Organic & Biochemistry: A custom lab manual, sold with textbook or separately. Following options are available:

1. ISBN: 0495391964 Lab manual (7th Ed.) Online at www.cengagebrain.com.
2. ISBN: 0495477621 Custom lab manual ("ACP Organic and Biochemistry") from [Beck's Bookstore](#).
3. ISBN: 0534401929 Full lab manual (5th Ed.)
4. ISBN: 0495015040 Full lab manual (6th Ed.)

Other Materials

1. Student Lab Notebook or similar with duplicate numbered pages
2. Optional: Molecular Models (strongly advised), Colored pens or pencils for taking notes (three colors plus black)

Course Description: Survey of organic chemistry including: nomenclature and reactions of major functional groups essential to biochemistry, an introduction to the structure and function of bio-molecules, and the metabolism of proteins, lipids, and carbohydrates. Writing assignments, as appropriate to the discipline, are part of the course. **Prerequisite: Chemistry 201 or Consent of Department Chair.**

Credit hrs 4, Contact hrs 6 (3 hrs Lect. + 3 hrs Lab)

Prerequisite: A grade of "C" or better in Chem. 201 & Chem. 203 or consent of the department chair. If you do not have the prerequisites, you need to see me.

STUDENT LEARNING OUTCOMES FOR CHEMISTRY 212:

Upon successful completion of this course the student will be able to:

1. Identify, classify, organize, analyze, and draw structures of organic molecules.
2. Apply the basic rules of organic nomenclature to convert between structures and names.
3. Recall reagents and predict products for a defined set of organic reactions.
4. Draw organic structures consistent with the results of specific chemical tests.
5. Predict the physical properties of organic chemicals based on their structures (e.g. relative boiling point, melting point, and solubility.)

- Analyze the influence of structure and physical properties of organic molecules on their biological properties (e.g. drug action, membrane fluidity, energy storage, cell signaling.)
- Recall details of specific case studies that apply the chemical principles learned in class to biology and medicine (e.g. goiter, thalidomide, AquaDots, Gleevec, vorinostat, etc.)
- Demonstrate proficiency in organic chemical laboratory techniques. (Chemical tests, extraction, filtration, instrumental analysis, molecular model building)

Active Pursuit: In order for students to remain in this course, they must actively pursue the objectives for this course. At midterm, any student who does not complete and turn in all major class assignments, lab reports, essay, and quiz will receive a midterm grade of Administrative withdrawal (ADW). Failure to classroom participation will also result in ADW. An ADW grade has consequences on student's GPA, financial aid, and other aspects of attending Truman. Simply attending the course and not producing the work and /or participating, does not constitute active pursuit.

Course Content: Survey of Organic and Biochemistry including: nomenclature and reactions of major functional groups essential to biochemistry, an introduction to the structure and function of bio-molecules, and the metabolism of proteins, lipids, and carbohydrates. Writing assignments, as appropriate to the discipline, are part of the course. *Prerequisite:* Chemistry 201 or Consent of Department Chair.

Laboratory work: The lab component consists of approximately 11 experiments plus 1 take home assignment (information about ingredients in food or cosmetics). You need to read the lab and be familiar with the laboratory procedure(s) you will be using.

NB: Prior to the scheduled lab period, students are required to have (1) carefully read the experimental write-up and (2) complete any pre-lab assignment prior to the beginning of the lab period. Pre-lab assignments are to be handed in at the *beginning* of the lab period. All experimental data are to be recorded in *ink directly* into your notebook. Do not write on pieces of scrap paper or paper towel as they tend to get lost.

Lab Reports Use *word processing* for all text, however, calculations and chemical equations may be handwritten. The report should be on **8 1/2 x 11 paper** with *no fringe edges* and should have the appearance of a professional report. Pages should be named and stapled together. Reports should be submitted one week after performing the experiment. There will be two points deduction for every class day late. No lab report will be accepted if it is more than two weeks late. Each lab report is worth 15 points. There are no make-up labs and all labs must be performed during the scheduled lab session.

Your report should include the following:

1. Cover sheet (1 pt)

The **cover sheet** should appear as follows

Course #: _____ Section #: _____

Name of the Experiment: _____

Your name: _____

Date performed: _____

Date submitted: _____

2. Abstract (2 pts): A brief summary (not more than 5 sentences) of the experiment which includes *what* you did, the *method used* and a brief statement regarding *your results* or lack of.

3. Methods (2 pts): A narrative of the experimental procedure in your own words. Known procedures need not be rewritten. Rather the references need to be cited and any modifications done to the published method stated.

4. Results (2 pts): A brief narrative of the experimental results.

5. Discussion (2 pts): Discuss the relationship between your experimental results and the expected results. Give plausible reasons (not limited to experimental errors) for any differences. Include the relevance of the results and your experience doing this experiment in relation to the stated objectives.

6. References (1 pts): List your sources. For example: Handbook of Chemistry and Physics, the proper citation of the handbook, texts or websites.

7. Figures, Tables, Data, and Spectra (2 pts): This section includes your tabulated data and results, calculations, graphs, and spectra.

8. Answers to questions (3 pts): Pre and post laboratory questions

Note: Laboratory performance points are included in the scores. Failure to follow correct laboratory techniques, and laboratory safety protocols will reduce your score.

*This is a lab course and as such you will need to satisfactorily complete the labs in addition to maintaining the letter grade in order to pass this course.

Quizzes: A quiz will be given every week, generally on Mondays, at the beginning of the class except if an exam is scheduled. No make-up quizzes will be given.

As a department policy, no electronic dictionaries, palm computers, cell phones are allowed during quizzes or exams.

Exams: Three interim exams and one final exam (total four exams). No make-up exams will be given. The approximate exam dates are given in the schedule.

Evaluation: Your grade will be based on your performance in the following. (25% from each will determine the final grade).

10 Quizzes (20 pts each)	200 pts	(25%)
11 Labs + 1 Take Home Assignment (15 pts each)	180 pts	(25%)
3 Interim Exams (100 pts each)	300 pts	(25%)
1 Final Exam (100 pts)	<u>100 pts</u>	<u>(25%)</u>
	Total	780 pts (100%)

The following scale will be used to assign letter grades:

A	90%
B	80%
C	70%
D	60%
F	<60%

Homework: Doing homework is essential to success in this class. Homework will be assigned to you in the class / through the blackboard.

Attendance: Your attendance is required at all classes. Absence in the first two classes will result "NSW". Absence in the exam, quiz, or lab will score '0'. Excessive absence or late arrival will result in non-active pursuit of the course leading to being dropped from the course or receiving an F. It is the responsibility of the student to contact the instructor regarding missing work. There will be no make up exam, quiz or lab.

Academic Support Services: Your success in this class is important to me. The following support services are available to student at Truman College:

Tutoring Center: Students are encouraged to get tutoring help with their assignments in room L129, 773-907-4785, www.trumancollege.edu/student-services/tutoring.

Student Success and Leadership Institute (SSLI): Other support services for students to achieve educational goals. Room 1435, 773-907-4714, www.trumancollege.edu/student-services/ssli

TRIO Student Support Services: For low-income students, first generation college students, or students with disabilities who need academic support, room 1435, 773-907-4797, www.trumancollege.edu/trio. Registration is required at the start of each semester.

Disability Access Center: If you have any concerns about participating or accomplishing the required course work because of a disability or medical condition, please see me after class, and also visit Ms. Linda Ford in the Student Services office. The Disability Access Center verifies needs pursuant to the American Disabilities Act (ADA), determines academic accommodations, and issues accommodation letters. Room 1428, 773-907-4725; www.trumancollege.edu/student-services/dac; Registration is required at the start of each semester.

FERPA: Family Educations Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student's educational needs. This law prohibits the faculty from revealing about students or students records over the phone or unsecure e-mail. The CCC e-mail meets FERPA requirements. www.ed.gov/policy/gen/guid/fpo/ferpa/index.html

Important things to remember:

1. Be familiar with the academic integrity policy. It appears in the student handbook. Cheating of any kind or taking of anyone else's work will not be tolerated.
2. Turn off all cell phones while in class.
3. Any assignment handed in late will have points off. **(2 points daily after the due date)**
4. Frequently check blackboard for any notices.
5. You are responsible for everything said in class even if you are not there.
6. Remember to read this syllabus (it is for your information) and refer to it from time to time.

ADA: Your success in this class is important to me. If you have any concerns about participating or accomplishing the required course work because of a disability or medical condition, please see me after class, and also visit Ms. Linda Ford in the Student Services office. Students must obtain written permission from her before any specific accommodations for disabilities are afforded.

Academic

Dishonesty: "Academic dishonesty" is a serious offense, which includes but is not limited to the following: Cheating, complicity, fabrication, falsification, forgery, and plagiarism. Cheating involves copying another student's paper, exam, quiz or use of technology devices to exchange information during class time and/or testing. It also involves the unauthorized use of notes, calculators, and other devices or study aids. In addition, it also includes the unauthorized collaboration on academic work of any sort. Complicity, on the other hand, involves the attempt to assist another student to commit an act of academic dishonesty. Fabrication and falsification, respectively, involve the invention or alteration of any information (data, results, sources, identity, and so forth) in academic work. Another example of academic dishonesty is forgery, which involves the duplication of a signature in order to represent it as authentic. Lastly, plagiarism involves the failure to acknowledge sources (of ideas, facts, charges, illustrations and so forth) properly in academic work, thus falsely representing another's ideas as one's own." - p. 39, CCC Student Policy Manual

TOPICAL OUTLINE

(A). List of Lecture Topics:

- Topic 1: Revision of Electronic Configuration, Bonding, VSEPR Theory
- Topic 2: Introduction to Organic Chemistry and Organic Functional Groups
- Topic 3: Alkanes: Structure and Nomenclature
- Topic 4: Alkenes and Alkynes: Nomenclature, Structure and Reactions:
- Topic 5: Benzene and its Derivatives
- Topic 6: Alcohols, Ethers, and Thiols
- Topic 7: Chirality and the Handedness of Molecules
- Topic 8: Amines
- Topic 9: Aldehydes & Ketones
- Topic 10: Carboxylic Acids
- Topic 11: Carboxylic Esters, Amides, and Anhydrides
- Topic 12: Carbohydrates
- Topic 13: Lipids
- Topic 14: Proteins
- Topic 15: Enzymes
- Topic 16: Chemical Communicators: Neurotransmitters and Hormones
- Topic 17: Nucleotides, Nucleic Acids, and Heredity

(B). List of Labs / Experiments:

Lab check-in, chemical hygiene plan, safety instructions, quiz, and lab tour (eyes wash, fire hydrants, emergency shower, waste disposal, balances, and microscale laboratory kits)*

- Lab 1: Identification of Hydrocarbons
- Lab 2: Structure in Organic Compounds: Use of Molecular Models I
- Lab 3: Identification of Alcohols and Phenols
- Lab 4: Isolation of Caffeine from Tea Leaves
- Lab 5: Stereochemistry: Use of Molecular Models II
- Lab 6: Properties of Amines and Amides
- Lab 7: Identification of Aldehydes and Ketones
- Lab 8: Preparation of Soap
- Lab 9: Reducing and Non-reducing Sugars/ Paper models of Carbohydrates
- Lab 10: Isolation and Identification of Casein
- Lab 11: Separation of Amino Acids by Paper Chromatography
- Lab 12: Take Home Assignment: Structures and toxicity (MSDS) information in Food and Cosmetics

Tentative Schedule (Spring 2013)

Below is a tentative schedule of lecture topics, labs, quizzes, and exams. The schedule/list of topics and lab experiments are subject to change. Students will be notified of changes, if any.

Week	Day	Date	Lecture Topic/Quiz/Exam/Lab
1	Monday	1/14	Introduction of Course Learning Outcomes, Goals, Syllabus/Attendance/Screening
	Wednesday	1/16	Topic 1: Revision of Electronic Configuration, Bonding and VSEPR Theory
2	Monday	1/21	Martin Luther King Holiday
	Wednesday	1/23	Topic 2: Introduction to Organic Chemistry and Organic Functional Groups
3	Monday	1/28	Topic 3: Alkanes — Structure and Nomenclature
	Wednesday	1/30	Quiz 1 (20 min. Topics 1 & 2) Lab Check-in, Safety Instructions/Safety Videos/Safety Quiz
4	Monday	2/4	Quiz 2 (20 min, Topic 3) Topic 4: Alkenes and Alkynes — Nomenclature, Structure and Reactions
	Wednesday	2/6	Lab 1: Identification of Hydrocarbons
5	Monday	2/11	Quiz 3 (20 min, Topic 4) Topic 5: Benzene and its Derivatives
	Wednesday	2/13	Lab 2: Structure in Organic Compounds: Use of Molecular Models I
6	Monday	2/18	President's Day Holiday
	Wednesday	2/20	Quiz 4 (20 min, Topic 5) Lab 3: Identification of Alcohols and Phenols
7	Monday	2/25	Topic 6: Alcohols, Ethers, and Thiols
	Wednesday	2/27	Lab 4: Isolation of Caffeine from Tea Leaves

8	Monday	3/4	Exam 1 (1 hr, Topics 1 thru 6) Topic 7: Chirality — The Handedness of Molecules
	Wednesday	3/6	Lab 5: Stereochemistry: Use of Molecular Models II
9	Monday	3/11	Quiz 5 (20 min, Topic 7) Topic 8: Amines
	Wednesday	3/13	Lab 6: Properties of Amines and Amides
10	Monday	3/18	Quiz 6 (20 min, Topic 8) Topic 9: Aldehydes & Ketones
	Wednesday	3/20	Lab 7: Identification of Aldehydes and Ketones
11	Mon - Sun	3/25-3/31	Spring Break
12	Monday	4/1	Quiz 7 (20 min, Topic 9) Topic 10: Carboxylic Acids
	Wednesday	4/3	Topic 11: Carboxylic Anhydrides, Esters, and Amides Lab 8: Preparation of Soap
13	Monday	4/8	Quiz 8 (20 min, Topics 10-11) Topic 12: Carbohydrates
	Wednesday	4/10	Lab 9: Reducing and Non-reducing Sugars / Paper Models of Carbohydrates
14	Monday	4/15	Exam 2: (1 hr, Topics 7 thru 11) Topic 13: Lipids
	Wednesday	4/17	Lab 10: Isolation and Identification of Casein
15	Monday	4/22	Quiz 9 (20 min, Topic 12-13) Topic 14: Proteins
	Wednesday	4/24	Topic 15: Enzymes Lab 11: Separation of Amino Acids by Paper Chromatography Lab 12: Take home assignment
16	Monday	4/29	Quiz 10 (20 min, Topics 14-15) Topic 16: Chemical Communicators — Neurotransmitters and Hormones
	Wednesday	5/1	Topic 17: Nucleotides, Nucleic Acids, and Heredity Molecule Building
17	Monday	5/6	Exam 3: (1 hr, Topics 12 thru 17); Take home assignment due Study Guide for Final Exam/Review
	Wednesday	5/8	Final Exam (Comprehensive, Topics 1 thru 17), Short Answers / Multiple Choice