**Valencia College (Osceola Campus) – Fall 2015**

**SYLLABUS**

1. **Course Title**: Organic Chemistry–II

**Course Alpha-Numeric**: CHM2211C – 18026

**Contact Hour Breakdown**: 4 credit hours, 3 hour class, 3 hour lab

1. **Course Outline** can be found online via Atlas.
2. **Lecture**
	1. **Day & Time**: Monday 12:00 pm – 2:45 pm
	2. **Building/Room Number**: Osceola campus, building 4, room 306
3. **Laboratory**
	1. **Day & Time**: Wednesday 12:00 pm – 2:45 pm
	2. **Building/Room Number**: Osceola campus, building 4, room 414
4. **Instructor**
	1. **Name**: Dr. Timothy Barnett, MA, PharmD
	2. **Office Building/Room**: Osceola campus, building 4, room 318
	3. **Phone**: 407-582-4974 or 407-299-5000, Ext 4974
	4. **Email**: tbarnett10@valenciacollege.edu
5. **Office Hours**: Office hours are posted on the office door(s), on the website, and are listed below. Questions and concerns can also be addressed via email (listed above). In addition, tutoring assistance is available.

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| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| OC: 8:00 am – 8:30 amOC: 11:15 am – 12:00 pmOC: 2:45 pm – 3:45 pm | OC: 8:00 am – 8:30 amOC: 11:15 am – 12:00 pmOC: 2:45 pm – 3:45 pm | OC: 8:00 am – 8:30 amOC: 11:15 am – 12:00 pmOC: 2:45 pm – 3:45 pm | OC: 8:00 am – 8:30 amOC: 11:15 am – 12:00 pmOC: 2:45 pm – 3:45 pm | Online: 8:00 am – 9:00 am |

1. **Required Texts and Materials**:
	1. “Organic Chemistry”, Paula Yurkanis Bruice, 7th Edition, 2014.
	2. TI30x series scientific calculator or equivalent scientific calculator.
	3. A bound composition notebook.
2. **Optional Texts and Materials**: “Organic Chemistry”, Paula Yurkanis Bruice, 7th Edition, 2014 Solutions Manual/Study Guide.
3. **Supplemental Materials**: All course materials will be available via Blackboard.
4. **Course Prerequisites**: Minimum grade of C in CHM 2210C.
5. **Course Description**: Continuation of CHM 2210C with laboratory devoted to multistep synthesis.
6. **Competencies Addressed**: Valencia faculty have defined four interrelated competencies (Value, Think, Communicate, and Act) that prepare students to succeed in the world community. These competencies are outlined in the College Catalog. In this course, through classroom discussion, group work, projects, labs, and other learning activities, you will further develop your mastery of these core competencies.

Specifically, during exams, quizzes, and laboratory assignments, you will be asked to communicate your knowledge of the information in a coherent manner with the use of relevant information to support your answer/opinion/analysis/claim. Your thinking skills will be developed in all aspects of this course; specifically, critical thinking skills will be necessary in order to internalize chemical concepts and problem-solving skills, as well as communicate answers effectively. Value competencies will be addressed in terms of valuing the usefulness of the scientific method in real-life scenarios, as well as understanding basic scientific information in order to be able to understand the relevance of current scientific discoveries in relation to your life. Finally, the act competency skills will be developed throughout the development and execution of a project or laboratory exercise using concepts and skills developed in the classroom.

1. **General Education Outcomes**: The general education program at Valencia is an integral part of the A.A. Degree program and is designed to contribute to the student’s educational growth by providing a basic liberal arts education. A student who completes the general education program should have achieved the following outcomes:
	1. **Cultural and Historical Understanding:** Demonstrate understanding of the diverse traditions of the world, and an individual’s place in it.
	2. **Quantitative and Scientific Reasoning:** Use processes, procedures, data, or evidence to solve problems and make effective decisions.
	3. **Communication Skills:** Engage in effective interpersonal, oral, and written communication.
	4. **Ethical Responsibility:** Demonstrate awareness of personal responsibility in one's civic, social, and academic life.
	5. **Information Literacy:** Locate, evaluate, and effectively use information from diverse sources.
	6. **Critical Thinking:** Effectively analyze, evaluate, synthesize, and apply information and ideas from diverse sources and disciplines.

Through classroom discussion, group work, projects, labs, and other learning activities, you will develop skills to attain competency in these outcomes. See the competencies addressed above for communication skills and critical thinking skills development. In addition, we will be exploring ethical responsibility during class analyses, address quantitative and scientific reasoning in labs and/or during project development and implementation and address information literacy during projects and/or labs.

1. **Major Learning Outcomes with Evidence**: At completion of course, students should be able to demonstrate a knowledge of organic chemistry and be able to:
2. **Demonstrate understanding of spectroscopy of organic compounds.**
	* 1. Utilize basic spectroscopic methods for identification and characterization of organic compounds.
3. **Demonstrate understanding of the properties, reactions, and mechanisms of organic compounds.**
	* 1. Recognize organometallic reagents and their properties such as bond polarity; understand and predict reactions of organometallic reagents.
		2. Name aromatic and carbonyl compounds utilizing IUPAC nomenclature and draw molecules given names.
		3. Define and recognize aromatic compounds and the importance of resonance and aromaticity; understand and predict reactions and mechanisms of aromatic compounds.
		4. Demonstrate knowledge of the chemical properties and reactions of carbonyl compounds; understand and predict reactions and mechanisms of carboxylic acid derivatives, ketones, and aldehydes.
		5. Discuss the acidity of organic acids and the importance of resonance and inductive effects.
		6. Relate carbonyl chemistry to real-world applications.
4. **Perform multistep synthesis.**
	* 1. Demonstrate proficiency in the use of reagents in a sequential manner in order to carry out multistep syntheses.
		2. Carry out multistep syntheses in the laboratory.
5. **Apply the scientific method to solve real-world problems, observe and communicate laboratory results, and draw conclusions based upon those results.**
	* 1. Perform single and multistep syntheses in the laboratory.
		2. Perform basic organic chemistry techniques in the laboratory for the separation, purification, and characterization of organic molecules.
		3. Write in a lab notebook and include procedure, observations, calculations, and conclusions.
6. **Topic Covered**:
7. **Unit 10 ½**
	* 1. Review of Reagents in Organic Chemistry Tool Box
		2. Review of Nucleophilic Substitution Reactions of Alkyl Halides, Elimination Reactions of Alkyl Halides, and Competing Reactions
		3. Designing Multistep Synthesis – Part I
8. **Unit 11**
9. Reactions of Alcohols, Ethers, Epoxides, Amines, and Sulfur Containing Compounds
10. **Unit 12**
11. Orgamometallic Compounds
12. **Unit 14 – Part I**
13. Mass Spectrometry (MS)
14. **Unit 14 – Part II**
15. Infrared (IR) & Ultraviolet (UV) Spectroscopy
16. Combining Mass Spectral and Infrared Data
17. **Unit 15**
18. Nuclear Magnetic Resonance (NMR) Spectroscopy
19. Combining Mass, Infrared, and NMR Spectral Data
20. **Unit 19 – Part I**
21. Reactions of Benzene
22. **Unit 19 – Part II**
23. Reactions of Substituted Benzenes
24. **Unit 16**
25. Carbonyl Compounds I: Reactions of Carboxylic Acids and Derivatives
26. **Unit 17**
27. Carbonyl Compounds II: Reactions of Aldehydes and Ketones
28. More Reactions of Carboxylic Acid Derivatives
29. Reactions of α, β–Unsaturated Carbonyl Compounds
30. **Unit 18**
31. Carbonyl Compounds III: Reactions at the α–Carbon of Carbonyl Compounds
32. **Unit 29**
33. Biological & Medicinal Chemistry
34. **Unit 20 (time permitting)**
35. More About Amines
36. Reactions of Heterocyclic Compounds
37. **Major Topics/Concepts/Skills/Issues**:
	1. Acquire core vocabulary, concepts, and problem-solving processes (concept ramifications) pertaining to the history and application of chemical theories.
	2. Develop ability to communicate basic chemical concepts and problem-solving processes effectively.
		1. All written materials must be in proper English and include accurate spelling, grammar, and punctuation.
	3. Develop appreciation of the scientific method as an effective problem-solving approach.
	4. Apply scientific method principles to solve real-world problems.
38. **Testing/Means of Evaluation**:
39. The last day to withdraw from the class is: Friday, November 15th, 2015.
40. The final grade will be calculated by the weighted total of all homework, quizzes, laboratory assignments, and examinations and/or projects.
41. Weighted grade breakdown:
	* + 1. Laboratory: 25%
			2. Projects: 30%
			3. Quizzes: 15%
			4. Homework: 10%
			5. Cumulative Final Examination: 20%
42. Unannounced quizzes will be given in either an individual or group setting to reinforce knowledge.
43. In general, at least one quiz over every chapter can be expected.
44. There will be a total of three individual projects and one cumulative final examination. Projects must be completed by the due date.
45. Project #0: Student Resume
46. A student resume must be completed and emailed or handed to the professor by the beginning of class on Monday, September 14th, 2015.
47. Project #1: Interpreting Mass and Infrared Spectral Data
48. Project #2: Interpreting Mass, Infrared, and NMR Spectral Data
49. Project #3: Budgeted Multistep Synthesis Reaction
50. This project will require an in–class individual presentation.
51. Cumulative Final Exam: Wednesday, December 16th, 2015 from 10:15 am – 12:45 pm
52. NO MAKE-UP QUIZZES, EXAMINATIONS, LABS OR PROJECTS WILL BE GIVEN. Homework, lab reports, and projects must be completed by the due date. Therefore, your attendance is mandatory.
53. The grading scale is as follows:
	* 1. ≥90.0%: A
		2. 80.0 – 89.9%: B
		3. 70.0 – 79.9%: C
		4. 60.0 – 69.9%: D
54. <60.0%: F
55. **Attendance Requirements**:
	1. Attendance will be taken each day at the beginning of class and each lab. Poor attendance will affect your final grade. Only properly documented excuses will be considered, and all missed material must be made up on the student’s own time.
	2. If a student has more than two absences occurring before the withdrawal date, the student may be withdrawn from the class by the instructor receiving a grade of W.
56. **Academic Support Services:**
	1. Students who require additional services must ensure the instructor receives proper documentation from the Office for Students with Disabilities. Accommodations will not be made until the instructor has the required documentation.
	2. Exams must be completed during or prior to the classroom exam time.
57. **Classroom Rules**:
	1. Programmable calculators and cell phones are not allowed on any quizzes, exams or in class. Only scientific calculators (i.e. TI30x series) can be used.
		1. Sharing calculators during exams and quizzes is prohibited.
	2. Cell phone and pagers must be turned off before entering class and lab. If they go off during class or lab, the student will be excused for the remainder of that class. In addition, if they go off during an exam or quiz, a student will be given a zero for the day and then excused from the class for that day.
58. **Laboratory**:
	1. Students will be asked to keep a laboratory notebook.
	2. Students must read the lab prior to entering the lab and complete designated pre–lab information in their lab notebook.
	3. Laboratory reports will generally be due 1 week following completion of the experiment unless otherwise indicated.
	4. Specific laboratory requirements will be discussed during the scheduled course time.
59. **Laboratory Safety (Abbreviated List)**:
	1. No student is allowed to work in the laboratory without a lab instructor present.
	2. Personal protective equipment (PPE), such as protective eyewear (e.g. safety goggles) and gloves will be worn at all times when working with hazardous chemical and biological materials or other hazardous items.
		1. Contact lenses are not recommended.
	3. Dress sensibly.
		1. Close-toed and close-heeled shoes (such as sneakers) are required at all times in the laboratory room.
		2. Sandals, Crocs, and flip-flops are always prohibited in the laboratory. Shoes should have a low and closed heel with a flat bottom. Socks, that cover the ankle, are required.
		3. Chemical resistant aprons or appropriate lab coats (with the underlying clothing) will be worn that completely cover the shoulders, chest, and abdomen. (See instructor for particular details.)
		4. Legs will be covered to the knee or lower.
		5. Loose fitting jewelry or clothing that may become entangled in laboratory equipment or pose any other danger is prohibited.
	4. Food, drink, chewing gum, candy, or tobacco products should not be visibly present in the laboratory room.
		1. Do not put anything in your mouth while working in the laboratory.
	5. Direct contact with any corrosive material will be immediately flushed with lots of water for no less than 15 minutes.
	6. Heating devices, such as Bunsen burners, will only be used when authorized by the instructor.
	7. If special precautions or accommodations are required, please supply documentation from the Office for Students with Disabilities or a medical professional.
		1. Please inform your instructor or supervisor if you have any medical condition that may compromise your safety in laboratory. This can be done in confidence in a meeting between you and your instructor/supervisor.
		2. The laboratory environment often times will involve the use of and/or exposure to chemicals or other hazardous substances/equipment.  If you are pregnant or plan on becoming pregnant during this course and are concerned about your exposure to these chemicals or hazardous substances/equipment, please see your instructor to discuss possible alternative arrangements.  Students are also invited to contact Mr. Ryan Kane, Title IX Coordinator/Equal Opportunity Officer, 407-582-3421, [rkane8@valenciacollege.edu](https://webmail.valenciacollege.edu/OWA/redir.aspx?SURL=LB9zMvs8LLQOnzTY3yLQe1RDL5P-ds6YJXujFmFPNr_uURndXKDSCG0AYQBpAGwAdABvADoAcgBrAGEAbgBlADgAQAB2AGEAbABlAG4AYwBpAGEAYwBvAGwAbABlAGcAZQAuAGUAZAB1AA..&URL=mailto%3arkane8%40valenciacollege.edu), regarding requests for alternative arrangements relating to pregnancy.
	8. Locate and learn how to use all of the safety equipment in the laboratory. This includes, but is not limited to, emergency safety showers, eyewashes, fire extinguishers, fire blankets, emergency shut-off valves, etc.
	9. Do not use any laboratory equipment or materials without proper instruction and/or training and proper supervision.
	10. Notify your instructor or laboratory supervisory personnel if any laboratory equipment is not working properly or is broken or damaged.
	11. Emergency equipment, exits, and aisles will not be obstructed at any time.
	12. Avoid crowding and haste and maintain an environment free from clutter.
	13. Report all spills, accidents and injuries to your instructor other laboratory supervisory personnel immediately, regardless of how minor.
	14. Students will not attempt to clean up chemical spills until consulting with your instructors or laboratory supervisory personnel.
	15. Broken glass will be immediately cleaned up by utilizing a dustpan and broom or other approved device.
		1. Do NOT handle broken glass with your hands.
		2. All broken glass will be placed ONLY in designated broken-glass containers.
	16. Recap all bottles, especially those containing chemicals or biological materials, immediately after use.
	17. Do not deviate from lab procedures or attempt unauthorized experiments without the instructor’s approval.
	18. Do not allow liquids (i.e. water) to come into contact with electrical equipment, outlets, or cords.
		1. Handle electrical cords with dry hands and remove electrical plugs from outlets by pulling on the plug and not the cord.
	19. Wash hands thoroughly with soap and water after handling all chemicals or biological materials.
	20. Clean your work table, other worked-in areas, glassware and equipment used immediately after completion of the experiment or activity.
	21. Dispose of all waste materials into the designated area(s) as instructed.
		1. All solid waste will be disposed of in approved and designated containers. Do NOT use laboratory sinks for disposal of any solid waste.
	22. Liquid wastes will be disposed of in approved and designated containers unless instructed to dispose of into the laboratory sinks.
	23. Turn off all equipment if you leave the lab at any time or at the end of lab.
60. Check that all water faucets, gas outlets, and/or other valves are turned off before you leave lab.
61. **Honor Code/Plagiarism:**
	1. Plagiarism, or the use of another source’s words and/or ideas without acknowledgement, is sternly prohibited. All assignments done outside of class (including but not limited to projects, homework, labs, or quizzes), which involve sources other than the stated textbook, will require proper bibliographic documentation. Students caught plagiarizing will be dismissed from class with a grade of F. If you have any questions about proper documentation procedures, ask your instructor.
		1. In this course, you may never cut and paste, copy, or write verbatim anything from any source; this includes information from the textbook, lab manual, and all other resources.
	2. Cheating on any assignment will result in dismissal from the course with a grade of F.
		1. Cheating consists of but is not limited to the following:
			1. Completing any exam or quiz with the aid of outside sources, unless specifically designated by the instructor.
			2. Copying of homework, lab notebooks, lab write–ups from another student.
			3. Copying of homework, lab notebooks, lab write–ups from a source without proper bibliographic documentation.

*The above schedule and procedures in this class are subject to change at the instructor’s discretion. 08/15.*