

Organic Chemistry – CHM 2210
Syllabus
Florida Keys Community College

I. Course Information

Course Prefix/Number/Course: CHM 2010 Organic Chemistry I

Credit Hours/Contact Hours: 3 Credit Hours / 45 Contact Hours

Prerequisites for the course: General Chemistry I and II

II. Course Method

This course is designed to meet face to face in the assigned location two days a week – Tuesdays and Thursdays – from 4:00 to 5:15 for 15 weeks.

III. Instructor Information

Instructor: Bruce Gragg

Email: bruce.gragg@fkcc.edu

Office Hours: TTh – 3:00 – 4:00

Phone: 305-296-9081 ex 212

IV. Description Continuing fundamentals of organic chemistry will be introduced.

Classes of compounds that will be studied are; alkanes, alkenes, alkynes, aromatic hydrocarbons and their derivatives. Additionally, the SN1, SN2, E1 and E2 mechanisms for predicting major product formation in reactions will be studied. Reference will be made to day-to-day events that are linked to organic chemistry topics.

V. College-level Competencies

Florida Keys Community College graduates who complete the core curriculum possess the knowledge, skills and values associated with college-educated individuals. Our graduates demonstrate mastery of competencies integrated within the academic disciplines, such as the ability to effectively communicate, seek creative solutions to problems, exhibit cultural awareness, and command basic technological skills.

1. **Communication:** Comprehend and articulate effectively – written and oral communication
2. **Critical thinking:** Demonstrate mastery of problem-solving skills in the discipline
3. **Diversity:** Interpret and evaluate societal and ethical issues, problems and values
4. **Technology:** Utilize technology effectively

VI. Course Calendar

1. The Course Calendar lists the learning activities and assessment measures that comprise this course on a modular basis. These activities and assessments are directly related to learning outcomes that

support the overall course objectives. There are a total of 400 points that can be achieved during this. Students are able to gauge their performance according to this grading scale throughout the duration of the course. The “Student Assessment” column lists all of the assignments required by this course and their due dates. I strongly recommend you print this out and refer to it often.

2. **Students are responsible for following the course calendar.** Consult your calendar before you start a new chapter or section. (Note: Some sections may not be covered in the same order as in the text). If you ever have a question that begins with “When is ___”, the answer is probably already published in this Course Calendar. Looking here first will probably get you a quick answer to your question.
3. **Some Modules will take more than one week to complete. Organic Chemistry I is followed the next term by Organic Chemistry II. If the following material is not all covered by the end of Organic Chemistry I, the next course in the sequence will begin where the first left off.**

Competency	Module/Week	Learning Outcomes	Learning Activities	Student Assessments	Points
1,2,4	<i>Module 1/Week 1</i> Obtain course materials. Introductory lecture on the chemistry of the Hydrocarbons	1. Be familiar with the textbook. 2. Have read the course syllabus and course calendar.	1. Review Chapter one of the textbook. 2. Begin reading Chapter 2 – Alkanes and Cycloalkanes: Introduction to Hydrocarbons.	1. Send me an e-mail at bruce.gragg@fkcc.edu to acknowledge that you received the syllabus at your class e-mail address. Due Date: end of week one	6.67
1,2,4	<i>Module 1/Week 2 - Objectives:</i> Lecture notes over Chapter 2 containing common and IUPAC nomenclature of the alkanes and cycloalkanes.	1. Be able to name the alkanes and cycloalkanes using common and IUPAC nomenclature rules. 2. Create all possible isomers of a given alkane and name them using the IUPAC system of nomenclature.	1. Read sections 1-24 in Chapter 2. 2. Take good class notes and review them before the next class	1. Work on the following problems at the end of chapter 2. Problems – 24, 25, 28, 30, 32, 33, 37. Due Date: End of Module 1.	6.67

1,2,4	<p><i>Module 2/Week 3</i></p> <p>Objectives: Chapter 3 – Alkanes and Cycloalkanes: Conformations and cis-trans Stereoisomers.</p> <p>1. Learn the terms and techniques used in conformational analysis of the alkanes.</p> <p>2. Learn how to predict the most stable isomer from a group of isomers.</p> <p>3. Study the nomenclature of Polycyclic ring systems.</p>	<p>1. Know how to classify different conformers as to type.</p> <p>2. Be able to rank a group of isomers according to stability.</p> <p>3. Know how to name simple polycyclic ring systems.</p>	<p>1. Read sections 1-16 in Chapter 3.</p> <p>2. Take good class notes and review them before the next class</p>	<p>1. Read Chapter 3 and work problems: 19, 20, 27a-g.</p> <p>2. Exam I at the end of Module 2.</p> <p>Due Date: End of Module 2.</p>	<p>1. Exam I 100 points</p> <p>2. 6.67</p>
1,2,4	<p><i>Module 3/Week 4</i></p> <p>Objectives – Chapter 4 – Alcohols and Alkyl Halides this will take about two weeks to complete.</p> <p>1. Study the IUPAC nomenclature rules for naming Alcohols and Alkyl Halides.</p> <p>2. Study how alcohols and alkyl halides are made.</p>	<p>1. Know how to name alcohols and alkyl halides using the IUPAC system of nomenclature.</p> <p>2. Be able to make alcohols and alkyl halides from different substrates.</p> <p>3. Be able to explain why certain carbocations and free</p>	<p>1. Activities – read chapter 4 carefully and be prepared to ask questions over material that is giving you trouble.</p> <p>2. Take good class notes and review them before the next class.</p>	<p>1. Work problems: 23, 24, 39, 40, 41, 43,44, 51 at the end of the chapter.</p> <p>Due Date: End of Module 3.</p>	6.67

	Learn about S _N 1 and S _N 2 mechanisms.	radicals are more stable than others.			
1,2,4	<p><i>Module 4/Week 5</i> Continuation of Chapter 4</p> <p>1. Study the IUPAC nomenclature rules for naming Alcohols and Alkyl Halides.</p> <p>2. Study how alcohols and alkyl halides are made.</p> <p>Learn about S_N1 and S_N2 mechanisms</p>	<p>1. Know how to name alcohols and alkyl halides using the IUPAC system of nomenclature.</p> <p>2. Be able to make alcohols and alkyl halides from different substrates.</p> <p>3. Be able to explain why certain carbocations and free radicals are more stable than others.</p> <p>2.</p>	<p>1. Activities – read chapter 4 carefully and be prepared to ask questions over material that is giving you trouble.</p> <p>2. Take good class notes and review them before the next class.</p>	<p>1. Work problems: 23, 24, 39, 40, 41, 43, 44, 51 at the end of the chapter.</p> <p>Due: End of week 5</p>	6.67
1,2,4	<p><i>Module 5/Weeks 6-7</i></p> <p>Objectives: Chapter 5 – Structure and Preparation of Alkenes: Elimination Reactions</p> <p>1. Learn the common and IUPAC nomenclature for the alkenes.</p> <p>2. Learn about the E₁ and the E₂ mechanisms that explain how alkenes are</p>	<p>1. Be able to name simple alkenes by the IUPAC system and know the names of the common alkenes.</p> <p>2. Be able to demonstrate how the E₁ and E₂ mechanisms work.</p> <p>3. Be able to rank a series of isomeric alkenes from the least</p>	<p>1. Activities – read chapter 5 carefully and be prepared to ask questions over material that is giving you trouble.</p> <p>2. Take good class notes and review them before each class.</p>	<p>1. Work problems: 28, 30, 33, 34, 36, 37, and 40 at the end of the chapter.</p> <p>Due: End of Module 5</p>	6.67

	<p>prepared.</p> <p>3. Learn how to predict the most stable of a series of alkene isomers.</p>	<p>stable to the most stable and explain why.</p>			
1,2,4	<p><i>Module 5 / Week 7</i></p> <p>Objectives: Chapter 5 – Structure and Preparation of Alkenes: Elimination Reactions</p> <p>1. Learn the common and IUPAC nomenclature for the alkenes.</p> <p>2. Learn about the E₁ and the E₂ mechanisms that explain how alkenes are prepared.</p> <p>3. Learn how to predict the most stable of a series of alkene isomers.</p>	<p>1. Be able to name simple alkenes by the IUPAC system and know the names of the common alkenes.</p> <p>2. Be able to demonstrate how the E₁ and E₂ mechanisms work.</p> <p>3. Be able to rank a series of isomeric alkenes from the least stable to the most stable and explain why.</p>	<p>1. Activities – read chapter 5 carefully and be prepared to ask questions over material that is giving you trouble.</p> <p>2. Take good class notes and review them before each class.</p>	<p>1. Work problems: 28, 30, 33, 34, 36, 37, and 40 at the end of the chapter.</p> <p>Due: End of Module 5</p>	6.67
1,2,4	<p><i>Module 6 / Week 8</i></p> <p>Objectives – Chapter 6: Addition Reactions of Alkenes</p> <p>Note: Chapter 6 is much the reverse of Chapter 5. Thus, we will only spend one week on it even though</p>	<p>1. Know how to prepare alcohols and alkyl halides from alkenes.</p> <p>2. Understand how modern polymers are made and the initiation process for these reactions.</p>	<p>1. Activities – read chapter 6 carefully and be prepared to ask questions over material that is giving you trouble.</p> <p>2. Take good class notes and review them before each class.</p>	<p>1. Work problems: 26 and 34 at the end of the chapter.</p> <p>2. Exam II</p> <p>Due: End of Module 6 / Week 8.</p>	6.67 Exam II 100 points

	<p>there is a lot of material.</p> <p>1. Learn to use Markovnikov's law to predict the final products of electrophilic addition reactions of alkenes.</p> <p>2. Study what causes carbocation rearrangements and how to predict when they will occur.</p>				
1,2,4	<p><i>Module 7 / Week 9</i></p> <p>Objectives – Chapter 7: Stereochemistry</p> <p>1. Learn about the importance of optical activity in compounds with chiral centers.</p> <p>2. Study the concepts of optical isomerism, racemization, and absolute configuration.</p>	<p>1. Know that the right or left “handedness” of a molecule determines its chemical nature and reactivity</p> <p>2. Be able to separate an enantiomeric pair of optical isomers.</p>	<p>1. Activities – read chapter 7 carefully and be prepared to ask questions over material that is giving you trouble.</p> <p>2. Take good class notes and review them before each class.</p>	<p>1. Work problems: 31,33,35,38, 44, and 50. at the end of the chapter.</p> <p>2. Exam II</p> <p>Due: End of Module 7/Week 9.</p>	6.67
1,2,4	<p><i>Module 8/Weeks 10-11</i></p> <p><i>Chapter 8 – Nucleophilic Substitution</i></p> <p>Objectives –</p> <p>1. Learn how to transform one functional group into another</p>	<p>1. Students will know how to use the “tools” in their chemistry</p>	<p>1. Read the Chapter carefully and take good lecture notes on a daily basis.</p> <p>2. Work recommended exercises in the lecture portion of the text and work questions; 20, 22, 25, 32, 33, 40, 44, 49, 50, and 51.</p>	<p>1. Attendance and class participation.</p> <p>2. Work all homework problems and assist in their solution in class.</p> <p>Due Date: No later than the end of</p>	6.67 6.67

	using appropriate substrates and reagents.	toolbox to change one functional group for another.		week 11.	
1,2,4	<p><i>Module 9/Week 12-13</i> Chapter 9 – Alkynes</p> <p>Objectives –</p> <p>Note: week thirteen is Spring Break, so two weeks are being allotted for Module 9.</p> <p>1. Learn how Alkynes are produced and their uses.</p>	<p>1. Students will be able to describe how Alkynes are obtained in nature and made synthetically.</p>	<p>1. Read the Chapter carefully and take good lecture notes on a daily basis.</p> <p>2. Work recommended exercises in the lecture portion of the text and work questions: 16, 17, 18, 25, 26, and 29.</p>	<p>1. Attendance and class participation.</p> <p>2. Work all homework problems and assist in their solution in class.</p> <p>Due Date: No later than the end of week 13.</p>	<p>6.67</p> <p>6.67</p>
1,2,4	<p>Module 10/ Week 14-15</p> <p>Chapter 10 – Conjugation in Alkadienes and Allylic Systems</p> <p>Objectives –</p> <p>1. Learn the importance of allylic groups and the enhanced reactivity of allylic hydrogens.</p> <p>2. Study the synthesis and reactions of the different categories of dienes. Special attention will be paid to the Diels-Alder reaction.</p>	<p>1. Be able to predict the major reaction products when there are competing sites on the starting material.</p> <p>2. Be able to classify a diene as to type and show a reaction scheme to make the desired product in acceptable yield.</p>	<p>1. Read the Chapter carefully and take good lecture notes on a daily basis.</p> <p>2. Work the recommended exercises in the lecture portion of the text and work questions: 23, 24, 28, 30, 32, and 42.</p>	<p>1. Attendance and class participation.</p> <p>2. Work all homework problems and assist in their solution in class.</p> <p>3. Exam III</p> <p>Due Date: No later than the end of week 15.</p>	<p>Exam III</p> <p>100 Points</p> <p>6.67</p>

1,2,4	Module 11/Week 16 Complete all course work and Exam III		1. Submit the on-line Course Evaluation	Due Date: No Later Than The Last Class Day	
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VII. Materials

Required Textbook: Organic Chemistry, 8th edition, Francis Carey and Robert Giuliano

Publisher: McGraw Hill

ISBN- 978-0-07-340261-1

VIII. Grading Scale (This is Standard Through Out the College)

The following grade scale will apply to this class:

- A: 90 % or above
- B: 80 - 90 %
- C: 70 - 80 %
- D: 60 - 70 %
- F: below 60 %

IX. Class Policies

E-mail Communications: All class e-mail communications should be conducted using your FKCC student e-mail address. The prime responsibility for timely communications rests with you - the student.

Important Note: If I have not responded to your e-mail or voicemail by the end of the day after you left the message, you should assume that I did not receive it and leave another message.

Late Work

- Any assignment not submitted by the date and time specified in the Course Calendar is considered late, unless you have contacted me and I have approved an extension in advance.
- The above policy does not apply to the final exam or any other assignment that may be due during the Final Exam period. No assignments due during the last week of classes will be accepted late to allow me to submit the course grades to the college on time.
- If you are out of contact and miss a deadline due to an extenuating circumstance, I expect you to contact me as soon as possible to discuss the situation. No exceptions will be made to the above policies unless you can provide documentation of the situation that I consider adequate.

Class Participation

Class participation is a subjective assessment by your instructor based on attendance and class preparation and involvement.

Withdrawal Policy

1. Students may withdraw without academic penalty from any course by the established deadline published in the College's calendar. This will result in a grade of 'W' for the course and will not count against the student's GPA.
2. Students will be permitted a maximum of two withdrawals per course. Upon the third attempt, the student **WILL NOT** be permitted to withdraw in accordance with State of Florida regulations and will receive an earned grade for that course.
3. It is the responsibility of the student wishing to withdraw from the course to do so by the date published in the College Academic Calendar.
4. Students who abandon the course or do not withdraw themselves by the published deadline are subject to receiving a grade of F.
5. An instructor may withdraw a student from courses for excessive absences and/or non-attendance up to the 70% point in the semester.

Exams and Quizzes

There will be three equally weighted exams. Each contributing 100 points toward your class grade.

Extra Credit Work

In general, I do not permit students to complete extra credit assignments to improve their grade. To earn the grade you desire, work hard all semester.

How Much Study Time You Should Expect To Devote To This Course

1. Most educators recommend that students spend 1-2 hours outside of class studying and completing assignments for every hour spent in class. For a typical 3 credit hour class, this translates into a total of 6-9 hours every week per course. This is a guideline. Some classes will require more time and effort than this guideline and some will require less, and the time any individual student will need to spend will vary. You should expect the study time you will need in any class will be toward the high side of the guideline until at least after the first exam or quiz. Then you can compare the effort you expended with the results you earned and make any adjustments necessary.
2. This class covers a lot of material and there are some concepts that may be difficult to grasp. Experience has shown that students who are successful in this class generally have study time totals on the higher of the scale.
3. Few students do well in this course if they are spending fewer than 5 or 6 hours studying every week. If you do not have a strong background in this subject, your study time will almost certainly need to be on the higher end of the scale if you want to earn a good grade.

Academic Honesty & Plagiarism

1. Students are expected to respect and uphold the standards of honesty in submitting written work to instructors. Though occurring in many forms, plagiarism in essence involves the presentation of another person's work as if it were the work of the presenter. Any cheating or plagiarism will result in

disciplinary action to be determined by the instructor based on the severity and nature of the offense. It is the student's responsibility to review the College's policy on Academic Honesty.

2. Collaboration and discussion is encouraged in all course aspects other than actually completing the assigned work (quizzes, exams, homework, projects, etc). Indeed, collaboration often leads to increased understanding of the material being covered. If you have questions about an assignment, I encourage you to speak up and ask questions about it.
3. Plagiarism is a form of fraud and will not be tolerated. You are expected to do your own work. Copying text or images from any source and claiming it as your own is considered plagiarism. Submitting copied text as most or all of your answer on a homework or project is also a form of dishonesty, even if you cite the source. I want to read YOUR words, not someone else's words. Using quoted text to support your answer will not usually be necessary in this class.
4. If I catch you in any form of academic dishonesty, you will receive a grade of zero for that assignment. If I catch you a second time, you will earn a failing grade for this class and be reported to the College.

Attendance Policy

1. I will monitor student attendance and participation in educational activities on a weekly basis.
2. An instructor may withdraw a student from courses for excessive absences and/or non-attendance up to the 70% point in the semester.

Delays in Getting the Textbook

Having regular access to the textbook is a requirement for this class. Whenever possible students should have the text in hand before the first day of class each semester, but there will be times that students are unable to get the text until after the class begins. If you are in this situation, follow the guidelines below. These guidelines are intended to be general enough to apply to all classes you take, and they may not all apply to this class. Not having the text is not an acceptable excuse for doing no work at all in this class.

1. The FKCC library has reserve copies of the textbook available for student use. These textbook copies cannot be removed from the library.
2. During the first week of the semester, complete all of the administrative items. This includes printing the Syllabus and the Course Calendar and Assessment Measures.

The above guidelines will probably not be enough to replace the text entirely, but they will allow you to learn enough to participate in the discussion forums each week. This participation is critical to your grade and also for attendance purposes.

Sources of Technical Assistance

If you are having any technical difficulties, please contact the Office of Distance Learning helpline at 305-809-3177 Monday—Friday 8:00AM to 4:00PM or email your question to FKCC.helpdesk@online.fkcc.edu.

Special Needs

If you have any special needs or requirements pertaining to this course, please discuss them with the instructor early in the term. If you have special needs as addressed by the Americans with Disabilities Act (ADA) and need assistance, please notify the Office for Students with Disabilities at 305-809-

3292 via email at: karla.malsheimer@fkcc.edu or the course instructor immediately. Reasonable efforts will be made to accommodate your special needs.

Community Decorum

A positive learning experience depends upon respect among all members of this classroom community. Disregard or disrespect for the process, the group or toward any individual will result in removal from the class and may result in you being dropped from the course. Respectful discourse in discussion and email areas is expected and anonymous posting will not be tolerated.

Sexual Predators

Federal and State law requires a person designated as a “sexual predator or offender” to register with the Florida Department of Law Enforcement (FDLE). The FDLE then is required to notify the local law enforcement agency where the registrant resides, attends or is employed by an institution of higher learning. Information regarding sexual predators or offenders attending or employed by an institution of higher learning may be obtained from the local law enforcement agency with jurisdiction for the particular campus, by calling the FDLE hotline (1-888-FL-PREDATOR) or (1-888-357-7332), or by visiting the FDLE website at www.fdle.state.fl.us/sexual_predators. If there are questions or concerns regarding personal safety, please contact the Campus Security Officer on your campus.

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