

Organic Chemistry I

Chemistry 355, Fall 2016

- Credits:** 3 credit hours
- Prerequisite:** “C” or better in CHM 212. Additionally, if this is your third attempt at this course (i.e. have a combination of two W, D or F grades in previous attempts) you must take CHM 254 prior to the third attempt.
- Instructor:** Dr. John Markiewicz
Science Building Room 482
markiewicz@marshall.edu
Phone: TBA
- Lecture Class:** Tuesday/Thursday 9:30-10:50 am
Room 473 (Detailed schedule below)
- Office Hours:** M 2-3 pm; W 10-11 am; Th 5-6 pm; or by appointment. I welcome drop-in visits, but I cannot guarantee that I will be available to help you during non-office hours.
- University Policies:** By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to www.marshall.edu/academic-affairs/policies/. Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment
- Catalog Description:** Organic Chemistry I. I, II, S. A systematic study of organic chemistry including modern structural theory, spectroscopy, and stereochemistry, application of these topics to the study of reactions and their mechanisms and application to synthesis. 3 lec. (PR: C or better in CHM 212).
- Required Materials:**
1. T.W Graham Solomons, Craig B. Fryhle and Scott A. Snyder Organic Chemistry 11th Ed. Wiley 2014. This book is available in hard cover, binder ready and e-book versions. Only one is required.
 2. Pen/pencil/paper for note taking

Recommended Materials:

1. Study guide to accompany the assigned text, or another source of solved textbook problems.
2. Molecular models

Learning Objectives:

1. To be able to use the fundamental concepts to solve problems of a routine nature, and also those problems requiring creativity, ingenuity and critical thinking
2. To demonstrate mastery of the fundamental concepts of organic chemistry including the structures, reactions, and reactivity trends.
3. To be able interpret spectral data and assemble a variety of clues to determine molecular structure.
4. To become familiar with the vocabulary of organic chemistry.

Practicing to Achieve the Learning Objectives:**A day or two before the lecture:**

Assigned reading should be completed before coming to class. I don't expect you to master the material before class. I want you to read it once and have figured out parts where you feel comfortable, and other parts where you are unsure or have questions. If you come to class without a basic idea of the material that we will be covering, you will be overwhelmed, and your retention of the material will be diminished. Before class, please print out the lecture notes.

Classroom lecture:

The format is a series of PowerPoint slides, as well as notes written on the blackboard/whiteboard. During the lecture, I will skip over some slides and use the blackboard. I will present the material somewhat differently than is presented in the lecture notes, but the essential material is already written for you in the PowerPoint slides. I highly recommend that you take notes during all parts of the lecture. When I lecture, I will focus on those things in each chapter which I think are the hardest to understand, and will try to present alternate explanations and examples to those in the book. If I don't spend much time on something, it doesn't mean I don't think it is important. It may just mean that the book does a good job of explaining that topic. You are responsible for all of the material in the book regardless of whether we covered it in class. At certain points in the lecture, we will break into small groups of 4-6 and work on problems related to the material that we have just discussed. These problems are not graded. This is an opportunity to see where your understanding of the material is in relation to your peers. You may find that you understand problem A better than everybody else, while you can get help with problem B and C from your friends who know those better than you. I highly encourage you to meet with your study groups outside of class to work on practice problems and to study for exams.

After class on the same day as the lecture:

You should attempt the assigned homework and practice problems. You really need to be exposed to the material 3 times to adequately absorb it. I feel that it is most efficient to have these 3 different times not too far apart.

See me outside of class.

Office hours are a good time to meet with me to discuss areas that give you difficulty. You may come alone, or with a group (maybe your study group). Office hours are set aside for you. You are top priority, and I will not feel bothered.

Review Session

I intend to conduct a one-hour review session two nights before each exam. I plan to hold these between 7 and 8 pm in a classroom that may be different from the lecture classroom. I will announce these at the beginning of the lecture before exam day. Attendance at review sessions is optional. However, if you do come, I expect that you attempted practice problems and you have questions to ask me. Do not expect that I will go over everything you need to know for the exam. I will just go over what you ask me. I will primarily work problems on the board. I may spend the whole hour talking about one subset of the material if that is what the students at the review session want. You can think of the review session as an additional office hour, but hopefully there will be a lot more students there asking questions.

Study Tips

Some students find it helpful to highlight the text book and make notes or rehash their class notes. This may work for you, but when I took organic, I found it was not helpful. I found it most helpful to work problems and then go back and read the material when I didn't understand something. If an area gives you more difficulty, practice those type of problems more until you get it. Work as many problems as you can. In this course, you will learn to solve a variety of different problems that require approaches that are not common elsewhere. Some students find it helpful to do every (or nearly every) problem in the book. Some students find flash cards helpful to learn reactions. Put each new reaction on an index card, and go through them all twice a day. I do not encourage memorization as a strategy for this course, but you are welcome to try this technique if you like. If you have particular trouble with something, put it on your 3X5 index card for the exam (see below).

Your success will be evaluated using three exams, a number of quizzes, and a final exam (see Schedule and Grading Policies below).

Grading Policy:**Exams/Final**

You will receive three hour exams and a final in the course. The exam questions may be similar to those done in class and any practice problems I provide. The final will be

cumulative. The exams are inherently cumulative due to the nature of the subject, but the material that you have not been tested on will be front and center. For example, you cannot write a reaction as required in chapter 8, if you cannot write structural formulae as you learned in chapter 1. The exams will be a combination of multiple choice, short answer and written. The structure of the final is likely to be written by all of the instructors in the course. You may bring a simple calculator (not capable of storing more than 3 memory slots of numerical data; not capable of storing text; not your cell phone or a laptop; if you bring a calculator, you must know how to use your own calculator), but I don't expect you will really need one or use it that often. You should bring your model kits partially assembled to the exam. You may *not* use the textbook, a computer (including phones), or your notes from class. You may bring a single 3X5 index card with hand-written notes. It can have anything you like on it, but it must be written in your own handwriting. I will include a small pKa chart in the exam. After we cover spectroscopy, I will include charts with summarized IR and NMR peak positions. For the final, you may bring all of your index cards from the four exams, plus a new one specific for the final. No collaborating or talking with others during exams, please; I will consider this cheating. No texting or cellphone use during exams. I will also consider this cheating.

Quizzes

You will receive short quizzes during the course. Unannounced quizzes will be given the first 5 minutes of lecture. If you are late, and you miss the quiz, it will count as one of your drops. All of the quizzes count equally, and I will drop one of every 5 you take. There are no make-ups, any missed quizzes will count as your drops.

Computation of your final average

Your average in the course will be calculated using either of two methods; your final average will be whichever is higher.

Method 1

Quizzes	25%
Exams (2)	50%
Final	25%

Method 2

Quizzes	25%
Exams (3)	60%
Final	15%

The scale of 60% = D, 70% = C, 80%=B and 90% = A will be used

I do not scale each exam. The above "cut-offs" are guaranteed, however I do reserve the right to use lower values. For example an A can be set to 88, but never 92. You should never feel unsure of your projected final grade. You may visit me anytime during office hours to check your standing in the course throughout the semester.

Exam Schedule

Please note, I do not reschedule exams. The only exception would be if the University is closed on that day. Should I fall behind in lecture, I might put less material on the exam, but it will occur on its scheduled day.

Make-up exams will only be given for University excused absences as defined in the catalog. If you do not have an excuse, you will receive a zero on the missed exam. Note: computation with Method 1 above allows you to get a zero or do poorly on one exam without jeopardizing your final grade. The make-up day for excused absences is Saturday Dec 10, 2016 after the final. The make-up exam is unlikely to be the one the class took. More likely it will be a previous exam given on the same material from the same textbook by a different instructor.

Support Services

Marshall University offers a variety of support services to students:

- [Tutoring Center Online](#)
- [Writing Center Online](#)
- [Libraries](#)
- [Textbook Service](#)
- [Disabled Student Services](#)
- [Campus Resources](#)
- [Technical Help](#)
- [VISTA Help](#)

“Policy for Students with Disabilities: Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone 304 696-2271 to provide documentation of their disability. Following this, the DSS Coordinator will send a letter to each of the student’s instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, please visit <http://www.marshall.edu/disabled> or contact Disabled Student Services Office at Prichard Hall 11, phone 304-696-2271.

CHM 355, Fall 2016

Schedule of Topics

T	23-Aug	1	The Basics: Bonding and Molecular Structure
R	25-Aug	1	The Basics: Bonding and Molecular Structure
T	30-Aug	2	Families of Carbon Compounds: Functional Groups
R	1-Sep	4	Nomenclature and Conformations of Alkanes and Cycloalkanes
T	6-Sep	4	Nomenclature and Conformations of Alkanes and Cycloalkanes
R	8-Sep	4	Nomenclature and Conformations of Alkanes and Cycloalkanes
T	13-Sep	4	Nomenclature and Conformations of Alkanes and Cycloalkanes
R	15-Sep	1, 2, 4	EXAM 1
T	20-Sep	5	Stereochemistry
R	22-Sep	5	Stereochemistry
T	27-Sep	5	Stereochemistry
R	29-Sep	3	Acids and Bases
T	4-Oct	6	Ionic Reactions: Nucleophilic Substitution and Elimination Reactions
R	6-Oct	6	Ionic Reactions: Nucleophilic Substitution and Elimination Reactions
T	11-Oct	6	Ionic Reactions: Nucleophilic Substitution and Elimination Reactions
R	13-Oct	6	Ionic Reactions: Nucleophilic Substitution and Elimination Reactions
T	18-Oct	1-6	EXAM 2
R	20-Oct	9	IR, Nuclear Magnetic Resonance and Mass Spectrometry
T	25-Oct	9	IR, Nuclear Magnetic Resonance and Mass Spectrometry
R	27-Oct	9	IR, Nuclear Magnetic Resonance and Mass Spectrometry
T	1-Nov	7	Alkenes and Alkynes I: Properties and Synthesis
R	3-Nov	7	Alkenes and Alkynes I: Properties and Synthesis
T	8-Nov	7	Alkenes and Alkynes I: Properties and Synthesis
R	10-Nov	8	Alkenes and Alkynes II: Addition Reactions
T	15-Nov	8	Alkenes and Alkynes II: Addition Reactions
R	17-Nov	8	Alkenes and Alkynes II: Addition Reactions
T	22-Nov		Thanksgiving Break
R	24-Nov		Thanksgiving Break
T	29-Nov	8	Alkenes and Alkynes II: Addition Reactions
R	1-Dec	1-9	EXAM 3
T	6-Dec	10	Radical reactions
R	8-Dec	1-10	FINAL EXAM 10 AM