Organic Chemistry I
Chemistry 355, Fall 2018

Credits: 3 credit hours

Prerequisite: "C" or better in CHM 212. Additionally, students who are on their third attempt at this course (i.e. have a combination of two W, D, F or NC grades in previous attempts) must take CHM 254 prior to the third attempt. No individual may take more than 3 attempts at CHM 355.

Instructor: Dr. John Markiewicz
Science Building Room 482
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Phone: 6-3618

Lecture Class: Tuesday/Thursday 4:00–5:15 pm
Science Building room 465 (Detailed schedule below)

Office Hours: T 5:20-6:20 pm;* W 12-1 pm;† R 3-4 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. Additional LA sessions for organic are posted outside of the chemistry library. Specifically professors Dr. Morgan TBA), Dr. O'Connor (TBA), and Dr. Schmitz (TBA) will be available for help in the chemistry library, in addition to TA's (times TBA)

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).

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* On the weeks of 9/5 and 12/5 this office hour will be moved to Thursday
† Held in the Chemistry Library S460

Required Materials:

1. Janice Gorzynski Smith *Organic Chemistry* 5th Ed. McGraw Hill 2017. This book must be purchased along with the access card for online homework. By purchasing a connects access card, you will receive a free e-book online. Additionally, the bookstore has hard copies and binder ready versions for an additional price. WARNING: purchasing connects access from a third party may result in inability to access the version of the online homework intended for this course.
2. Pen/pencil/paper for note taking.
3. Model Kits (can share with group). HGS model #1003A
4. For students who earned a C in CHM 212 and those on their second attempt at CHM 355: *Pushing Electrons* by Daniel P. Weeks, 4th edition, Cengage 2014 (1st, 2nd or 3rd edition also acceptable). The publishers claim that this workbook can be completed within 12-16 hours. The workbook should be done within the first three weeks of class. This book helps you with the basics of assigning formal charges and keeping track of electrons with curved arrows. Many of the students who have failed CHM 355 in the past might have passed if they had mastered the fundamentals taught in this book.

Recommended Materials:

1. Study guide to accompany the assigned text, or another source of solved textbook problems.
2. *Pushing Electrons* by Daniel P. Weeks, 4th edition, Cengage 2014. It is recommended that you complete this workbook within the first 3 weeks of this course. The publisher claims that the workbook can be completed in 12-16 hours.
3. *Organic Chemistry as a Second Language, First Semester Topics* by David Klein Wiley 2017.

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 become familiar with the vocabulary of organic chemistry.
4. Acquire ability to rationalize new chemical reactions and show mechanisms using curved-arrow notation.
5. To be able to plan a synthesis of a new molecule through the appropriate application of synthetic methods

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. Try to attend every 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 5 and work on problems related to the material that we have just discussed. I will assign these groups during the second day of class. I will call on individual groups to give the answer to a problem, and a representative from your group will need to answer. This is a good opportunity to see where your understanding of the material is in relation to your peers. 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. You should set aside at least one hour every day to work on studying for this class. Please do not wait until the week before the test to begin working on problems. When you study, I recommend that you go to a quiet, empty room (possibly in the library) without any distractions. Try earnestly to work the problems without consulting the book or videos on the internet. If you struggle a little bit and then come up with an answer on your own, even if it is wrong, that means you studying correctly. If you look at the problem and right away seek help from the answer key, you will not benefit from pondering about the basics elements of the problem, and you will not fully understand how the correct answer was derived. Excess time spent in practice under non-ideal conditions does not equal proficiency. You only waste your time by watching YouTube videos without working problems on your own. Reading or working problems while watching television is also a waste of time.

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 plan to conduct a one-hour review session two nights before each exam, weather permitting. I plan to hold these after 5 pm in a classroom that may be different from the lecture classroom. See the schedule below. 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

This course is notorious for being difficult, and many students complain that they have to invest a lot of time with little return. This reputation comes from the fact that many students do not study properly. 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 reread 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 is on your 3X5 index card for the exam (see below). I don't want you to simply understand *what* is the correct answer; I want you to understand *why* it is the correct answer.

Practice Exam Questions

Practice exams from last semester will be available on blackboard. Extra practice problems will also be available. The answer keys for the practice exams will not be available until 2 days before the actual exam (posted after the review session). This is because many students do not use these study materials properly. Many students give up prematurely when trying to answer a question, and they look at the answer before much effort has been extended. You are supposed to earnestly attempt to do the problems without looking at the key. You should only check your work after you have done your best to answer the question. If you wish for the best training, take the practice exam and time yourself under conditions similar to the actual exam (no distractions, breaks, or looking at the book or internet). Note which problems you get wrong, and which problems cause you to take the most time and which ones cost you the least amount of time. The actual test material may differ substantially from that given on the practice exams, especially since we have recently aquired a different textbook.

Your success will be evaluated using three exams, online homework, an assignment using model kits, and a final exam (see Schedule and Grading Policies below).

Grading Policy:

Three In-Class Exams

You will receive three in-class exams in addition to a final exam 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, and free response. 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 pK_a chart in the exam. 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. I do not plan on including bonus questions on the exam, but I reserve the right to do so if I see fit. Bonus questions are typically set at a very high level relative to the rest of the exam.

Final

The final exam is mandatory and cannot be dropped. The final will be given on **Saturday, December 8, 2018**. The final exam will consist of questions chosen by all of the organic faculty members. You will *not* be allowed to bring a calculator, model kit, or an index card with notes. No tables of data will be given. It is expected that you have sufficiently practiced solving problems to the point that you no longer need to look at the card or charts. The other rules are the same as for the first three exams.

Exam Schedule and Makeup Exams

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 a qualifying excuse, you will receive a zero on the missed exam. In order for a makeup exam to occur, you must go through the student affairs office and they must email me to certify your excused absence. The make-up day for excused absences is Saturday, April 29, immediately 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.

Exam Extended Time Penalty

The exams are typically rigorously timed and end at a specific time, usually when the class period officially ends. I do not typically come around and collect the exams at this time. It is your responsibility to make sure that I have your exam when the allotted time is up. When I say "the exam has ended," you must immediately come to me and give me your exam. For every minute after that time that I do not have your exam, I will subtract 10 points from your score. Since the exams are typically out of 100 points, after 10 min you will have a zero. I will tell you when there are 5 minutes remaining, so you should not lose points accidentally with this method.

Online Homework

Homework is assigned for each chapter via McGraw-Hill Connect online. You will need to login with the code you bought from the bookstore. If you did not buy an access code from the bookstore, access can be accessed online by following the link on blackboard. Do not go to access Connects separately, as you will be on a generic session, and your homework grades will not be reported to your instructor. For most questions, you have two-three attempts to get the correct answer. For each attempt at a question beyond one, the total possible points you can earn will decrease. The online homework is similar to an open-book quiz. You are not allowed to work with others, and your session is timed (typically 6 hours). Do not wait until just before the deadline to attempt the homework. Whatever work you have completed by the deadline will be turned in at that time for grading. No late assignments will be accepted. Do not underestimate the importance of the homework assignments!

Molecular Model Kit Passport

This assignment is due on Tuesday, October 30st, 2018 at noon. Although there is only one due date, it is intended for you to have worked on this a little each week. Feel free to submit the assignment as early as October 25th, if you wish. For each section, build the model requested, and take your photograph along with the model. Paste the picture in the passport when you are done. This assignment is to be uploaded to Blackboard® as a digital copy, and no hard copies will be accepted.

Computation of your final average

Your average in the course will be calculated from a combination of online homework, your model kit passport, 3 exams and a final. The material on exam one is typically much easier than the other exams, and is therefore worth slightly less. All exams are cumulative due to the nature of the course. It is important that you master the material on exam one to a high degree, otherwise extraordinary effort will be needed to catchup to be on track for success on exam 2, etc. Earning an A on exam one does not guarantee passing this course.

Online homework	10%
Model kit passport	5%
Exam 1	19%
Exam 2	22%
Exam 3	22%
Final exam	22%

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; it is unlikely that the cutoffs will be lowered. Do not count on the possibility that I will lower or even round your weighted average in order to give you the next highest grade. You should never feel unsure of your projected final grade. I typically update the grades on Blackboard® once a week, either on Friday or Monday, although the exams typically require about one week from the date given for grading to be completed.

Electronic Material for the Course.

Copies of lecture notes are made available via Blackboard. Practice exams, extra practice questions, and exam keys are also available from Blackboard. Access to these materials requires that you are registered for this course. Please be considerate of the environment and avoid printing more than you need. Please do not distribute copies of these materials to students outside of this course. If your friend from another course would like something, please direct them to me. I am usually happy to send copies to other individuals, but only I should do this. Please do not upload copies of the course materials, including practice exams and keys, to any file-sharing websites. Much time and effort have gone into the preparation of these materials, and I do not want to subject them to the risk of plagiarism.

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.

Tentative Lecture Schedule

	date	chapter	CHM 355 Fall 2018 topic	LA extra Credit avail.	Model Kit Exercise
T	21-Aug	1	Introduction; The Basics: Bonding and Molecular Structure	1	1
R	23-Aug	1	The Basics: Bonding and Molecular Structure	1	2
T	28-Aug	2	Acids and Bases	1,2	
R	30-Aug	3	Functional Groups and Intermolecular Forces	2,3	
T	4-Sep	4	Nomenclature and Conformations of Alkanes and Cycloalkanes	2,3	3,4
R	6-Sep	4	Nomenclature and Conformations of Alkanes and Cycloalkanes	3,4	5,6
T	11-Sep	1-4	EXAM 1	4	
R	13-Sep	5	Stereochemistry	5	7
T	18-Sep	5	Stereochemistry	5	8
R	20-Sep	5	Stereochemistry	5	9,10
T	25-Sep	6	Understanding Organic Reactions	5,6	
R	27-Sep	7	Alkyl Halides: Nucleophilic Substitution	6	11
T	2-Oct	7	Alkyl Halides: Nucleophilic Substitution	6	12,13
R	4-Oct	8	Alkyl Halides: Elimination Reactions	7	14
T	9-Oct	8	Alkyl Halides: Elimination Reactions	7,8	
R	11-Oct	1-8	EXAM 2	8	
T	16-Oct	9	Alcohols, Ethers and Related Compounds	9	15
R	18-Oct	9	Alcohols, Ethers and Related Compounds	9	16
T	23-Oct	9	Alcohols, Ethers and Related Compounds	9	
R	25-Oct	10	Alkenes, Transformations	9	17
T	30-Oct	10	Alkenes, Transformations	10	**Passport Due noon**
R	1-Nov	10	Alkenes, Transformations	10	
T	6-Nov	11	Alkynes, Synthesis	10	
R	8-Nov	11	Alkynes, Synthesis	10	
T	13-Nov	11	Alkynes, Synthesis	11	
R	15-Nov	1-11	EXAM 3	11	
T	20-Nov		Thanksgiving Break (no class)		
R	22-Nov		Thanksgiving Break (no class)		
T	27-Nov	12	Oxidation and Reduction	11	
R	29-Nov	12	Oxidation and Reduction	12	
T	4-Dec	12	Oxidation and Reduction	12	
R	6-Dec	12	Oxidation and Reduction/(Review)*	12	
S	**8-Dec**	1-12	FINAL EXAM 10 AM **Location TBA**		

Tentative schedule of optional review sessions:

Exam 1	F	7-Sep
Exam 2	M	8-Oct
Exam 3	M	12-Nov
Final	R	6-Dec

All out-of-class review sessions planned for 5:20-6:20 pm in S 465. (weather permitting; will not be rescheduled)