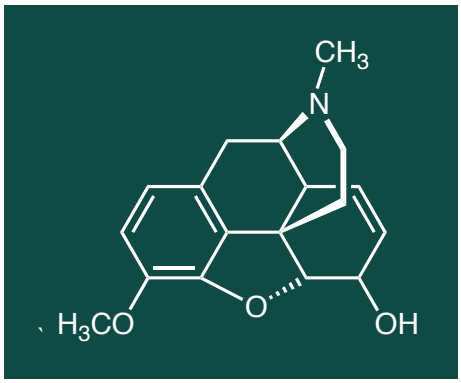
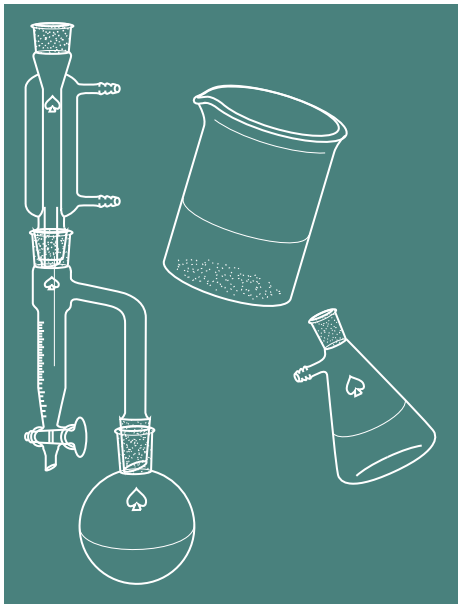


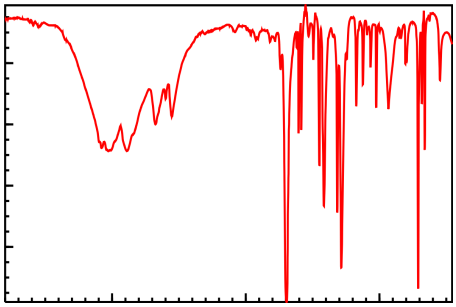


Summer 2019

Organic Chemistry I (221)

Syllabus and Course Information

Prof. Chad Landrie



Oakton Community College

Table of Contents

Syllabus

I. Course Information

Course

Prefix	Number	CRN	Name	Credit Hours	Lecture Hours	Lab Hours
CHM	221-1E1	20251	Organic Chemistry I	4	3	3

Class Schedule

CRN	Type	Time	Days	Location	Dates
20251	Lecture	11:00 am – 12:50 pm	MTWR	156 Lee Center	5/20/19-6/26/19
	Lab	1:00 pm – 3:45 pm	TWR	340 Lee Center	5/21/19-6/26/19

Instructor

Dr. Chad L. Landrie
Associate Professor of Chemistry
Office Room: 109 Lee Center
Office Phone: 847-376-7439
Email: clandrie@oakton.edu; chadlandrie@gmail.com
Website: http://www.chadlandrie.com
Blog: http://chadlandrie.blogspot.com
Twitter: @chadlandrie
YouTube: http://www.youtube.com/user/chadlandrie

Students may also contact me through the clients listed in the table below, particularly during office hours.

Instant Messaging Client	Dr. L's User ID	Client Link/Info
Google Hangouts	chadlandrie@gmail.com	hangouts.google.com
Skype	clandrie	www.skype.com

Office Hours

Day	Time	Location
M	1:00 pm – 2:00 pm	109 or 340 Lee
TWR	4:00 pm – 5:00 pm	109 or 340 Lee

Students who cannot attend during the above times may request an appointment through email or by going to https://chadlandrie.youcanbook.me. Although I will guarantee my availability during the above hours, I am also available at other times when I am not teaching for walk-ins.

Website, D2L, Chemical Database, Blog & Twitter

The URL for the course website is http://oakton.chadlandrie.com. Some of the current content includes course descriptions; instructor contact information; i>clicker instructions and statistics; lecture and lab schedule; lecture notes; and shared files available for download including rubrics, study guides and the course syllabus. Most of these resources will also be available on D2L.

Our Learning Management System (LMS) is Desire to Learn (D2L). D2L (https://d2l.oakton.edu) will be used to make class announcements, disseminate updates to the class schedule, post course content such as lecture slides, post grades, complete homework. Be sure to setup your D2L notifications so that you alerted when a news item is posted, when the schedule has changed or when grades are updated.

An online database of many of the chemicals used in our experiments can be found at: http://stockroom.chadlandrie.com. Relevant information includes physical properties, structure, hazard and safety information, GHS statements, NFPA symbols and spectra (infrared, ultraviolet-visible and mass spectrum). You will use this to complete pre-lab assignments.

A blog (http://chadlandrie.blogspot.com/) and Twitter feed (@chadlandrie) will also be maintained. I aim to use both mediums to educate students about current news in scientific fields, highlight career opportunities and to initiate discussions in organic chemistry. These are for personal interest only and not course requirements.

II. Prerequisites

Successful completion of CHM 122 or CHM 207 or equivalent, with minimum grade of C, or consent of instructor.

III. Course Description

Course is first of two-course sequence (CHM 221 and CHM 222). Content presents theories, structures, and reactions of organic chemistry, including the properties of various functional groups; bonding and structure of organic molecules; properties and reactions of aromatic and aliphatic hydrocarbons and alkyl halides; stereochemistry; spectroscopy, including infrared and nuclear magnetic resonance; reaction intermediates and mechanisms such as nucleophilic substitutions and electrophilic additions; and multi-step organic synthesis. Weekly hands-on lab activities including preparations, separations, and identifications of organic compounds. Identical to CHM 221 except that CHM 223 includes two three-hour labs per week, rather than one three-hour lab per week.

IV. Learning Objectives

Lecture Objectives

1. Apply the three models of bonding–Lewis, valence bond and molecular orbital theory–as well as their extensions–hybridization and resonance–to describe covalent bonding in organic species.
2. Draw and interconvert drawings of neutral and charged organic species using condensed formulae, bond-line formulae, Newman projections, sawhorse projections and Fisher projections.
3. Name organic molecules and functional groups using systematic nomenclature defined by the International Union of Pure and Applied Chemistry (IUPAC).
4. Rank organic species according to physical and chemical properties, including polarity, boiling point, heat of combustion, acidity, solubility, bond strength, stability and reactivity, based on their structural features.
5. Classify isomers as either constitutional or one of the categories of stereoisomer: conformational, configurational, geometrical, optical, enantiomer, diastereomer and meso.
6. Relate analytical data, including optical rotation, infrared (IR) spectroscopy, mass spectrometry, nuclear magnetic resonance (NMR) spectroscopy and ultraviolet (UV) spectroscopy to structural features in organic molecules.
7. Illustrate the thermodynamic and kinetic properties of chemical reactions by constructing a reaction coordinate diagram that illustrates the relative energies of reactants, products, intermediates and transition states as well as quantities of enthalpy and activation energy.
8. Draw mechanisms and transition states for radical reactions and polar reactions as well as the interconversion of resonance structures using curved-arrow notation.
9. Predict the products of and conditions required for: addition reactions of alkenes and alkynes; substitution reactions of alcohols and alkyl halides, alkylation reactions of alkynes; elimination reactions of alcohols and alkyl halides; the Diels-Alder reaction; electrophilic aromatic substitution; and nucleophilic aromatic substitution.
10. Identify and describe the physical and chemical properties of conjugated systems and aromatic compounds.
11. Design synthetic routes to organic molecules using retrosynthetic analysis.

LABORATORY OBJECTIVES

1. Minimize risk to self and others by adhering to documented and verbalized laboratory safety policies.
2. Operate instrumentation, such as an infrared spectrometer, melting point device, and polarimeter, independently to acquire data relevant to an experiment.
3. Assemble glassware apparatuses to perform techniques such as distillation, extraction and chromatography.
4. Document laboratory procedures, observations, analyses and conclusions in a laboratory notebook according to scientific standards.

V. Academic Integrity and Student Conduct

STUDENT ACADEMIC INTEGRITY POLICY

Students and employees at Oakton Community College are required to demonstrate academic integrity and follow Oakton's Code of Academic Conduct. This code prohibits:

- cheating,
- plagiarism (turning in work not written by you, or lacking proper citation),
- falsification and fabrication (lying or distorting the truth),
- helping others to cheat,
- unauthorized changes on official documents,
- pretending to be someone else or having someone else pretend to be you,
- making or accepting bribes, special favors, or threats, and
- any other behavior that violates academic integrity.

There are serious consequences to violations of the academic integrity policy. Oakton's policies and procedures provide students a fair hearing if a complaint is made against you. If you are found to have violated the policy, the minimum penalty is failure on the assignment, and a disciplinary record will be established and kept on file in the office of the Vice President for Student Affairs for a period of 3 years.

Please review the Code of Academic Conduct **and** the Code of Student Conduct, both located online at: http://www.oakton.edu/studentlife/student-handbook.pdf

COURSE POLICIES

a.	Academic Dishonesty:	All violations of *The Code of Academic Conduct* will be addressed according to the *Student Academic Integrity Policy*.
b.	Lecture Attendance:	Students are expected to attend every lecture on-time. On-time is 2-5 minutes early. Attendance is recorded each time the i>clicker is used in class. There will not be opportunities to makeup i>clicker points that are lost due to absences. Lecture attendance will also be used at the end of the semester to evaluate students on the borderline of the course curves.
c.	Laboratory Attendance	Attendance at all laboratory sessions is mandatory. Failure to attend a laboratory session will result in a score of zero for that lab's worksheet score. No laboratory experiments can be made up. Students with approved, extenuating circumstances (e.g., severe illness, death in the family) may be allowed to complete a supplementary assignment or worksheet pertaining to the missed experiment.
d.	Laboratory Tardiness	Students who are more than 5 minutes late for a laboratory will not be allowed to participate and will receive a score of zero for that lab's worksheet score. The first few minutes of the lab time are especially important since the instructor reviews safety and hazards.

e.	Missed Quizzes:	Failure to take a quiz due to absence will result in a score of zero. No quizzes will be made up. At least 12 quizzes will be administered. Only the top ten scores will be counted.
f.	Missed Exams	Failure to take an exam due to absence will result in a score of zero. No makeup exams will be given. If a student misses an exam and has an approved, and documented, extenuating circumstance (e.g., severe illness, death in the family), the final exam percentage will be used in place of the missing exam with a 5% deduction. (Missing exam % = Final exam % - 5%). The final exam will be administered on the last day of student attendance for this course. The final exam may not be taken early.
g.	Incompletes	Incompletes will only be granted for students showing proof of extenuating circumstances that prevented them from completing the course. Incompletes will not be given for students who are simply dissatisfied with their progress in the course or who are unable to handle their total course load. When an incomplete is assigned, the work already completed and its respective scores will be used for evaluation (i.e., no work may be redone).
h.	Exam/Quiz Errors	Students that suspect a grading or adding error on any exam, quiz or assignment must bring the original to Dr. L for review within one week after the date in which it was returned was returned. Exams and quizzes that have been written on or manipulated may not be submitted for review.
i.	Official Scores	Dr. Landrie maintains the official scores, point total and grades for each student. The D2L course website is updated often, but may not reflect the official, current record. Students may see Dr. Landrie anytime during office hours to obtain a grade report with their current, official scores and estimated course grade.
j.	Written Homework	Assignments and their due dates can be found on the class schedule. Two points will be deducted from the score for each day an assignment is late, including weekends. Extensions to these deadlines will only be granted when there are extenuating circumstances that can be documented. Students are expected to complete homework individually. While some amount of group work is expected and encouraged, blatantly copying answers from a peer is considered plagiarism and will be addressed according to the *Student Academic Integrity Policy*. Accept in the case of theft, all involved parties will be held responsible for plagiarism.
k.	OWL Homework	OWL in an online homework platform. Assignments are organized by lecture. OWL assignments are available one day before the lecture and due one day after the lecture by 11:55 pm. For example, the OWL assignment for a Tuesday lecture is available at 12:05 am on Monday and due by 11:55 pm on Wednesday. Late submissions incur a penalty of 50%.
l.	Laboratory Worksheets	Laboratory worksheets must be completed individually. Students will work in groups during the laboratory; however, all laboratory worksheets must be completed individually. Copying any part of a peer's worksheet will be considered plagiarism and will be addressed according to the *Student Academic Integrity Policy*. Accept in the case of theft, all involved parties will be held responsible for plagiarism.
m.	Worksheet Deadlines	All worksheets are due the following class period regardless of whether a lab is completed that day. Late worksheets will be assessed a 2 point penalty per day.

n.	i>Clicker Cheating	Under no circumstances may a student cast votes for another student. Students caught with more than one i>clicker during lecture will have the i>clickers in their possession confiscated. Users of all clickers confiscated will receive a zero for the i>clicker portion of the course.
o.	Assigned Reading	Students are responsible for reading the textbook sections listed in the class schedule *prior* to the lecture covering those sections. Quizzes may cover assigned reading before the material is presented in lecture.
p.	Laboratory Safety Procedures	Students must follow all laboratory safety procedures outlined in this syllabus and in Appendix A of the laboratory manual. Failure to follow these safety protocols may result in a loss of laboratory notebook points (2 points per violation) or earned grade of zero for that laboratory and dismissal from the laboratory for severe violations (e.g. eating or drinking in the lab). Additionally, students are expected to read all hazard and safety information for the chemicals they will be using during the laboratory. These details can be found online at http://stockroom.chadlandrie.com/
q.	Goggles	All students must wear goggles in the lab at all times when chemicals, glassware or instruments are being used or when instructed by the Professor. Students not wearing goggles will be warned once; subsequent violations will result in the loss of two points for each violation.
r.	Email Communication	Announcements will be made through the D2L *Announcements* feature. Students are responsible for checking their D2L *Announcements* at least once daily. It is recommended that students sign up for D2L notification to receive announcements by email and/or phone.

VI. Outline of Course Topics

LECTURE TOPICS

Textbook: McMurray, J. *Organic Chemistry*, 9th ed.; Cengage: Boston, MA, 2016.

1. Structure and Bonding
   a. Atoms, Electrons and Orbitals
   b. Covalent and Ionic Bonding
      i) Models of Bonding in H_2: Lewis, valence bond and molecular orbital theory
      ii) Polar covalent bonds and electronegativity
      iii) Electrostatic potential maps
      iv) Valence electrons, formal charge and the octet rule
   c. Structural formulas of organic molecules
      i) Introduction to classes of hydrocarbons (alkanes, alkenes, alkynes and arenes)
      ii) Condensed formula and bond-line formula drawings
      iii) Constitutional isomers and stereoisomers
      iv) Resonance structures
   d. Shapes of simple organic molecules
      i) Valence-Shell Electron Repulsion Theory (VSEPR)
      ii) Molecular dipole moments
   e. Hybridization model of bonding
      i) sp^3, sp^2, and sp hybridization of carbon
      ii) bonding in ethane, ethylene and acetylene
      iii) bonding in water and ammonia: hybridization of oxygen and nitrogen
      iv) relationship of carbon s-character to electronegativity and bond-strength
2. Acid-Base Properties of Organic Species
   a. Arrhenius, Bronsted-Lowry and Lewis definitions

   b. Acid-base equilibria and conjugates; Calculting K_{eq} from pK_as
   c. Reaction coordinate diagrams and relationships between ΔH, K_a and pK_a
   d. Mechanism of protonation and deprotonation using curved-arrow notation
   e. Structural effects on acid strength
      i) Enthalpy of reactants and products
      ii) Resonance stabilization of anionic conjugate bases
3. Alkanes
   a. IUPAC nomenclature of branched alkanes
   b. Trends in physical and chemical properties of alkanes
      i) boiling point, equilibrium vapor pressure, heat of combustion
      ii) Van der Waals forces: London-dispersion forces
   c. Conformational stereoisomers of ethane, butane and higher alkanes
4. Cycloalkanes
   a. Shapes and bond angles of cylcoalkanes
   b. Angle strain and heat of combustion
   c. Conformations of cyclohexane
      i) Axial and equatorial bonds
      ii) Chair inversion (ring-flipping)
   d. Conformational analysis of mono and disubstituted cyclohexanes
5. Stereochemistry
   a. Molecular chirality
      i) Carbon chirality center
      ii) Planes and points of symmetry as tests for achiral molecules
   b. Enantiomers and their physical properties
   c. Cahn-Ingold-Prelog *R*-*S* notation
   d. Optical activity
   e. Diastereomers, meso forms and their physical properties
   f. Chirality centers other than carbon
      i) Sulfur (sulfoxides) and nitrogen (amines)
      ii) Pyramidal inversion of nitrogen
   g. Fisher projections
6. Analytical Techniques for Characterizing Organic Molecules
   a. Mass Spectrometry
   b. Infrared Spectroscopy
   c. Nuclear Magnetic Resonance
   d. Ultraviolet-visible spectroscopy
7. Kinetic and Thermodynamic Properties of Chemical Reactions
   a. Reaction coordinate diagrams (intermediates, enthalpy of reaction, activation energy)
   b. Transition-state theory and reaction rates
   c. Hammond postulate
   d. Drawing transition-states
8. Alcohols and Alkyl Halides
   a. IUPAC nomenclature and classes of alkyl halides and alcohols
   b. Trends in physical properties (boiling point, solubility, polarity)
      i) Intermolecular forces: dipole-dipole
      ii) Intermolecular forces: London-dispersion forces
   c. Preparation of alkyl halides from alcohols by substitution reactions
      i) Reactivity of alcohols and hydrogen halides toward substitution
      ii) Mechanisms of S_N1 and S_N2 processes
      iii) Structure, bonding and stability of carbocations
      iv) Nucleophiles and Electrophiles
      v) Stereochemistry of S_N1 reactions
      vi) Nucleophilic substitution of alkyl sulfonates
      vii) Solvent effects on the rate of substitution
   d. Preparation of alkyl halides by radical halogenation of alkanes
      i) Structure, bonding and stability of carbon free radicals
      ii) Regioselectivity of chlorination and bromination; Hammond's postulate
9. Alkenes and their Elimination Reactions

a. IUPAC nomenclature and geometrical isomers (cis/trans and *E/Z* notation)
b. Physical properties and relative stability by degree of substitution
c. Preparation of alkenes by dehydration of alcohols, dehydrohalogentaion of alkyl halides and elimination of alkyl sulfonates
    i) Mechanisms of E1 and E2 reactions
    ii) Stereoselectivity
    iii) Regioselectivity: Zaitsev and Hofmann rules
    iv) Anti eliminations in E2 reactions: stereoelectronic effects
    v) Rearrangements in alcohol dehydration
    vi) Competition between substitution and elimination reactions

10. Alkenes: Addition Reactions
    a. Hydrogenation: Stereoselective syn addition of H_2
    b. Electrophilic addition of hydrogen halides and sulfuric acid
        i) Regioselectivity: Markovnikov's rule
        ii) Mechanistic basis for Markovnikov's rule
    c. Hydroboration-oxidation
        i) Syn-addition (concerted) mechanism for hydroboration
        ii) Regioselectivity
    d. Halogen addition and halonium ions
    e. Formation of vicinal halohydrins through anti-addition
    f. Free-radical addition of hydrogen bromide
    g. Epoxidation
    h. Ozonolysis
11. Alkynes
    a. IUPAC nomenclature
    b. Acidity of terminal alkynes
    c. Alkylation of acetylenes
    d. Preparation through double dehydrohalogenation
    e. Addition reactions of alkynes
        i) Hydrogenation
        ii) Stereoselective hydrogenation to *cis*-alkenes (Lindlar catalyst)
        iii) Metal-ammonia reduction to *trans*-alkenes
        iv) Halogenation
        v) Hydration to ketones and hydroboration-oxidation to aldehydes
12. Conjugation in Alkadienes and Allylic Systems
    a. Classes, stability, bonding and resonance energy of dienes
    b. Substitution reactions of allylic and benzylic halides
    c. Preparation by elimination reactions
    d. Addition of hydrogen halides and halogens: kinetic and thermodynamic pathways
    e. Diels-Alder reaction: mechanism and regioselectivity
13. Arenes and Aromaticity
    a. Structure and stability of benzene
        i) Frontier molecular orbitals of benzene and its closed-shell configuration
        ii) Resonance energy: heat of hydrogenation of benzene vs. (*Z*)-1,3,5-hexatriene
        iii) IUPAC nomenclature of substituted derivatives of benzene
    b. Aromatic and Antiaromatic Species, Including Ions
        i) Huckel's rule and closed-shell configurations
        ii) Molecular orbital diagrams from Frost circles
        iii) Heterocyclic aromatic compounds
    c. Electrophilic aromatic substitution (S_E-Ar)
        i) Arenium ions and the mechanism of S_E-Ar
        ii) Nitration, sulfonation, halogenation
        iii) Friedel-Crafts alkylation and acylation
        iv) Synthesis of alkylbenzenes by acylation-reduction (Clemmensen/Wolf-Kishner)
        v) Substituent effects on regioselectivity (orth-para directors, meta-directors)
        vi) Substituent effects on rate (activating and deactivating groups)
    d. Nucleophilic aromatic substitution
        i) Nitro-substituted arenes

ii) Addition-elimination mechanism

LABORATORY EXPERIMENTS

The laboratory activities and experiments can be found in the laboratory manual for the course. Ten of the following experiments will be completed.

1. Orientation to the Laboratory and Calibration of Equipment
2. Physical Properties of Organic Compounds
3. Solubility
4. Purification of a Solid by Recrystallization
5. Extraction
6. Constitution Isomers and Nomenclature
7. Molecular Modeling and Conformers
8. Chirality and Stereoisomers
9. Fractional Distillation
10. Infrared Spectroscopy
11. Steam Distillation
12. Preparation of an Alkene
13. Dichlorocarbene Addition to an Alkene
14. Introduction to Synthesis
15. Chromatography
16. Preparation of *tert*-pentyl chloride
17. Reactivities of Alkyl Halides: S_N1 and S_N2 Reactions
18. Dehydrohalogenation: An E2 Reaction
19. Nuclear Magnetic Resonance Spectroscopy
20. TLC Separation and Analysis of Analgesics
21. Isolation of the Active Ingredient in a Commercial Analgesic
22. A Diels-Alder Reaction
23. Nitration of Methyl Benzoate
24. Preparation of Acetylsalicylic Acid (Aspirin)

VII. Methods of Instruction

a.	Lectures	Lectures will be presented using digital presentation software and an overhead projector. The lecture topics will be taken from the current course textbook as well as from outside sources at the instructor's discretion. Following class, lecture will be posted on the course website for students to download.
b.	i>Clicker	i>Clicker questions will be asked during each lecture; students will vote on the correct multiple choice answer using their i>clickers. These questions will also serve to initiate discussion and to measure whether concepts are being understood as they are taught.
c.	Skill Builder Exercises	Several times throughout the semester, the lecture period will be used to complete activities designed to help students master problem solving in organic chemistry. The activities will be completed in groups and as a class to give students the opportunity to observe how others, including the instructor, solve organic chemistry problems.
d.	Homework	The instructor will assign written and online homework that compliments the lecture and textbook material. Since all questions are not graded for correctness, it is the student's responsibility to ensure each question is mastered by studying solutions to similar problems, working with colleagues and seeking assistance from the instructor.

e.	Laboratory Experiments	Students will conduct several experiments in organic chemistry designed to connect the concepts learned in lecture to practical experiences. These experiments will include learning analytical techniques, such as melting point determination, thin-layer chromatography, gas chromatography, NMR spectroscopy, infrared spectroscopy and gas chromatography. Students will also synthesize organic compounds using classical and contemporary chemical reactions in organic synthesis.
f.	D2L Multimedia	Multimedia such as practice worksheets, handouts, instructional videos and practice quizzes will be posted to D2L.

VIII. Course Practices Required

a.	Writing Skills	Students are expected to write at the college level on homework, exams and written assignments. College level writing includes adherence to rules of grammar, the ability to organize thoughts into a logical order using cohesive paragraph structures, and legible handwriting for written assignments.
b.	Communication Skills	Students are expected to communicate the language and ideas of organic chemistry orally as well through their writing. All students will be asked to answer questions during class and to participate in discussions and oral presentations. Students are also responsible for communicating with their peers and their instructor when they need help. Students are encouraged to ask questions and to seek out answers to help them master the course content.
c.	Computer Skills	Students will require basic computer skills to complete homework assignments, to complete written assignments using a word processor, to search the academic literature using online databases, to access the course website and to view their course grades using the D2L online course management system and to communicate with the instructor through email.
d.	Organization and Time Management	Students are responsible for checking the class schedule to determine when assignments are due, what advanced reading is required prior to each lecture and when exams and quizzes will be given. Students are expected to read the listed sections in the schedule before they are covered in lecture. Students are responsible for using the class schedule to plan their studying activities prior to quizzes and exams. Students are responsible for determining when prelab entries must be completed in their lab notebooks.
e.	Critical Thinking	Students are expected to solve problems in organic chemistry that require them to summarize, analyze, and apply concepts. While memorization is an important skill and needed in parts of the course, it is not the primary method of learning and success cannot be obtained solely through it.

IX. Instructional Materials

1.	Required:	McMurray, J. *Organic Chemistry*, 9th ed., 2016; Cengage: Boston, MA. ISBN: 978-1-305-08048-5 or McMurray, J. *Organic Chemistry Loose Leaf,* 9th ed., 2016; Cengage: Boston, MA. ISBN: 978-1-305-70102-1.
2.	Required:	OWLv2. This is the Cengage online homework platform. An access code is bundled with the loose-leaf text sold by the Oakton Bookstore. It can also be purchased directly from Cengage.
3.	Required:	*CHM 221/223 – Organic Chemistry I Laboratory Experiments*.

4. Recommended: *Student Lab Notebook*, Hayden-McNeil, ISBN: 978-1-930882-74-4 (Or similar; Must be spiral-bound and contain at least 50 carbonless sets. The notebook must contain carbonless copies that can be torn out each week.)
5. Required: Chemical splash goggles (indirectly vented). The goggles must seal completely around the face. Shield-type or glasses-type are not allowed
6. Recommended: i>Clicker (1 or 2); MacMillan (www.iclicker.com); ISBN: 1429280476. If students do not wish to purchase their own i>Clicker, one will be loaned to them at the beginning of each class.
7. Recommended: Molecular model set. Preferred set is "MOLECULAR VISIONS Organic, Inorganic, Organometallic" in a green plastic box. Sold by Darling Models, INC. ISBN: 978-09648837-1-0.

X. Methods of Evaluating Student Progress

Summary of Point Distribution

The course will be graded according to individual performance on each of the following assessment items:

Course Activity	Points		No.		Total Points	%
i>Clicker	40	x	1	=	40	4%
Homework - Written	5	x	10	=	50	5%
Homework – OWL (online)	3	x	20	=	60	6%
Quizzes	10	x	10	=	100	10%
Skill Builder	10	x	3	=	30	3%
Semester Exams	150	x	2	=	300	30%
ACS Exam	70	x	1	=	70	7%
Final Exam	200	x	1	=	200	20%
Laboratory Worksheets (average * 100)	100	X	1	=	100	10%
Laboratory Exam	50	x	1	=	50	5%
Course Total					**1000**	**100%**

Description of Graded Course Activities

a. i>Clicker — The i>clicker will be used in most of the lectures this semester. Generally, 5-10 questions will be asked during each lecture to reinforce a concept just covered or to determine students' preconceptions and understanding of the required reading. These questions will appear on the projector screen as part of the lecture slides. One point will be awarded to each student that answers the question; one additional point will be given for the correct answer. The questions may be reviewed later by downloading the lecture slides or by viewing the i>clicker page within the course website.

b. Written Homework — Assignments covers the material presented in the lecture and textbook readings. Content typically spans 2-4 lectures. Problem types are similar to those that will be found on exams. Each homework assignment is worth 4 points. A random set of questions will be graded out of 4 points for correctness. Not all questions are graded.

c. OWL Homework — OWL is an online homework platform. Many of the problems are the same as those found in the textbook. There is approximately one assignment for each lecture in the course. Problems will encourage student mastery by allowing multiple attempts, providing hints and embedding links to the Ebook and other resources.

d. Quizzes — Quizzes will be given on the dates listed in the class schedule. At least ten quizzes, each worth 10 points will be assigned. The top ten scores will count toward the

		final grade. Quizzes will test mastery of topics presented in previous lectures as well as the assigned reading that should be completed prior to each lecture. These aim to prepare students for upcoming exams. Problems types will be similar.
e.	Skill Builder	Five times during the semester students will work in groups to complete critical thinking problems. The activities will give students the opportunity to observe how others, including the instructor, solve organic chemistry problems. Their primary objective is to help review for upcoming exams.
f.	Semester Exams	Exams will cover material presented during lecture as well as assigned readings. Question formats will include drawing reactants or products in reaction schemes, multiple choice, short answer, essay, drawing reaction mechanisms and ranking. Skill Builders, Quizzes, Sapling and i>Clicker should be used as examples of each question type. A study guide listing the topics, questions types and approximate point distribution will be distributed one week prior to each exam.
g.	ACS Exam	The American Chemical Society exam is multiple-choice. This exam is worth 100 points and will be used mainly to ensure that all sections are meeting minimum standards for proficiency in organic chemistry.
h.	Final Exam	The final exam is cumulative. The format of the exam will be similar to the three semester exams. A study guide will be distributed one week prior to the exam.
i.	Laboratory Worksheets	For each experiment, students will complete a laboratory worksheet in which they will summarize hazard and safety information for the chemicals used, record data and observations during the experiment and answer questions pertaining to the experiment. These worksheets should be used to prepare for the lab exam. Lab notebook entries (e.g, procedure and observations) will be included.
j.	Laboratory Exam	A laboratory exam will be administered at the end of the term. It will cover the theory, techniques and results of the experiments performed.

COURSE EVALUATION, "THE CURVE"

The word "curve" means many different things to many different people. This course is not graded on a traditional *Bell curve*. In other words, there is no set number of As, Bs, Cs and Ds that must be earned. However, I will determine the minimum point values required to earn a letter grade for each component of the course. These limits will not be determined in advance since I cannot predict the difficulty of exams and quizzes and do take into account how well I've taught a topic or explained an assignment. Students may gauge their progress by viewing the limits on the course website or D2L for each course component as well as the course total. These limits vary slightly each semester since variations in exam difficulty, teaching quality and grading styles cannot be avoided. However, the approximate course curve will likely be:

80% (800 pts), A; 70% (700 pts), B; 55% (550 pts), C; 45% (450 pts), D

XI. Other Course Information

STUDENTS WITH DISABILITIES

If you have a documented learning, psychological, or physical disability, you may be entitled to reasonable accommodations or services. To request accommodations or services, contact the Access and Disability Resource Center at the Des Plaines or Skokie campus. All students are expected to fulfill essential course requirements. The College will not waive any essential skill or requirement of a course or degree program. For more information or to request accommodations, contact the ADRC at:

URL: http://www.oakton.edu/studentservices/disability_services/

Location: Rm 2400 Des Plaines Bldg
Phone: 847-635-1759

Religious Holidays

Oakton Community College recognizes the broad diversity of religious beliefs of its constituencies. The college has embraced a practice of shared responsibility in the event a religious observance interferes with class work or assignments. Students who inform instructors in advance of an intended absence for a major religious observance will not be penalized. The instructor will make reasonable accommodation for students, which may include providing a make-up test, altering assignment dates, permitting a student to attend another section of the same course for a class period or similar remedies. Instructors are not responsible for teaching material again. Instructors should inform students of this practice at the beginning of the semester so that arrangements can be made accordingly. Similar consideration is accorded to faculty, staff and administrators and is provided for in their respective contracts.

Title IX

Oakton Community College is committed to maintaining a safe campus environment emphasizing the dignity and worth of all members of the community and complies with all Title IX requirements.

Resources and support for

- pregnancy-related and parenting accommodations; and
- victims of sexual misconduct

can be found at http://www.oakton.edu/title9

Change of Health Status

Students who have a change of health status need to contact me as soon as possible. For accommodations specifically related to pregnancy or post-pregnancy-related parenting, contact me and consult the Title IX policy http://www.oakton.edu/title9. If you are pregnant or become pregnant during the semester, you have the option to meet with me to discuss reasonable accommodations that may be necessary. It may not be possible to grant accommodations after the fact, so it is better to prepare in advance for any possible scenarios.

Students First

Oakton has implemented an academic intervention program, and I am a participating faculty member. I am committed to your success in this course and at this college. I may, therefore, refer you to other individuals and/or services available to help you achieve academic success. Please understand that these referrals are intended to supplement, not replace, interactions you may have with me during office hours or in class. They are intended to provide a support network for your academic and personal success at the College. As such, please help us help you by responding promptly and appropriately to these referrals. If you have any questions regarding this program, please don't hesitate to ask.

College Closures

If the college closes due to an emergency, such as flooding, please check your email and course D2L shells for communication from me regarding how learning will continue to take place if the college is closed for an extended period of time. Also, don't forget to sign up for Alert Oakton to receive notifications of college closings or emergencies.

Recording Policy

Electronic video and/or audio recording is not permitted during class unless the student obtains written permission from the instructor. In cases where recordings are allowed, such content is restricted to personal use only. Any distribution of such recordings is strictly prohibited. Personal use is defined as use by an individual student for the purpose of studying or completing course assignments.

For students who have been approved for audio and/or video recording of lectures and other classroom activities as a reasonable accommodation by Oakton's Access Disabilities Resource Center (ADRC), applicable federal law

requires instructors to permit those recordings. Such recordings are also limited to personal use. Any distribution of such recordings is strictly prohibited.

Failure to abide by this policy will result in disciplinary action through the Code of Student Conduct.

Lecture and Laboratory Schedule

The lecture and laboratory schedules can be found at http://oakton.chadlandrie.com/. They will be updated weekly as changes are made. Student will also receive notifications in class and through the D2L *Announcements* feature when changes are made to the schedule.

Refund Dates and Withdraw Deadlines

These dates can be found by logging into my.Oakton.edu (Self-Service Banner → *Concise Student Schedule*).

Important Dates

All of the dates below can be found in the College's Academic Calendar. You may view this online at: http://www.oakton.edu/academics/acad_calendar/index.php .

Date	Item
5/20/2019	Classes Begin
5/27/2019	Memorial Day, No Classes
Check my.oakton.edu	Last day to withdraw and have courses dropped from record.
Check my.oakton.edu	Last day to withdraw with a "W" from a summer course.
6/26/19	Last day of student attendance (in this course)

Laboratory Safety Procedures and Policies

1. General – Applies to all Oakton laboratories

1.1. Students are not allowed in lab rooms unless an instructor is present
1.2. No eating or drinking is allowed in the lab at any time.
1.3. No application of cosmetics.
1.4. All laboratory supplies must be treated with respect. This includes but is not limited to: glassware, models, cadavers, slides, microscopes, laboratory equipment, and chemicals.
1.5. Proper attire must be maintained in the labs at all times
  1.5.1. No open-toed shoes of any kind including sandals and flip flops
  1.5.2. No shorts or skirts above the knee – exposure of skin surfaces should be minimized
  1.5.3. No dangling jewelry or baggy clothing
  1.5.4. Long hair should be pulled back or confined
1.6. Mouth pipetting is not permitted. Mechanical pipetting devices should be provided
1.7. Wash hands thoroughly with soap and water after handling chemicals of any kind or live or preserved specimen.
1.8. Wash hands thoroughly with soap and water before leaving the lab. Keep hands away from eyes and face.
1.9. Wear the appropriate PPE (goggles, gloves, lab coats, etc.) as deemed necessary for that particular laboratory exercise or as directed by the instructor.
1.10. All reagent bottles or containers should be kept tightly closed to minimize accidental spills.
1.11. All spills and accidents should be reported immediately to the instructor. Waste and broken material should be disposed of according to the specific guidelines developed for that laboratory exercise. Broken glass must be disposed of with a dustpan and broom.
1.12. Faculty, staff and students should know the location of: emergency exits and evacuation plans, fire extinguishers, eye wash stations, fire blanket, safety showers, first aid kit, phone and emergency numbers. Students should not be allowed into the prep area unless supervised.
1.13. Students who may be pregnant or may have a significant health issue should inform the instructor of such issues so that appropriate decisions can be made regarding student safety.

2. Safety Procedures for Chemistry Students

2.1. Be Prepared Before Coming to Lab
  2.1.1. Read over the assigned laboratory procedures. Respond to any pre-class questions and/or complete any assigned pre-laboratory work.
  2.1.2. Be aware of any hazards associated with the chemicals you will be using and the proper method of disposal for any wastes you will be generating.
  2.1.3. Dress appropriately. You should be well covered - no shorts above the knees, sandals or bare midriffs (even when you stoop over) preferably with older, cotton clothes (jeans and a cotton shirt or tee are fine). Avoid bulky clothes or hanging necklaces. Hair longer than shoulder length – on both men and women – should be tied back or confined. Do not wear valuable jewelry to lab.

2.2. Familiarize Yourself With the Laboratory Facilities During the Check-in Lab
  2.2.1. Learn the location and how to properly use the laboratory safety equipment including safety goggles, eye washes, shower, fire blanket, and fire extinguisher.
  2.2.2. Identify the lab exits and locate the closest fire alarm box.
  2.2.3. Check out the posted laboratory evacuation plan.
  2.2.4. Become familiar with laboratory references, including chemical labels, for checking on chemical hazards.
  2.2.5. Become familiar with the appearance and proper name of the equipment in your assigned drawer(s) and other commonly used equipment in the cupboards and drawers around the laboratory.

2.3. Conduct yourself in a responsible and safe manner during all laboratory periods.
  2.3.1. Wear SAFETY GOGGLES at all times when you are in the laboratory.

2.3.2. Be on time to the lab so that you hear the safety review and other introductory material.
2.3.3. Place book bags and winter coats, scarves, etc. in the designated areas.
2.3.4. Follow written and verbal instructions carefully. If you are required to develop your own procedure (i.e. during a lab practical or for a special project), please have your procedure checked and approved by your instructor before implementing.
2.3.5. Perform only the assigned activities/procedures. Use only the prescribed equipment and chemicals. Check labels and instructions carefully.
2.3.6. Keep work areas clean. Keep floors, aisles, and passageways clear of obstructions. Avoid leaving drawers and cupboards open.
2.3.7. Do not eat, drink, or smoke in the laboratory.
2.3.8. Conduct yourself in an appropriate manner – no horseplay. Walk and don't run. Be respectful toward your fellow students, instructor and the facilities.
2.3.9. While conducting an experiment in the laboratory, keep your hands away from your eyes and face. Wash your hands thoroughly after completing the laboratory experiment.
2.3.10. Replace tops on containers of chemicals immediately after use. Keep coasters under the acid reagent bottles
2.3.11. Most of all, be alert and proceed with caution in all laboratory activities.
2.3.12. Students should not be in the stock area unless accompanied by their instructor.

2.4. Execute laboratory techniques knowledgeably and safely
2.4.1. Never taste any chemicals.
2.4.2. Never inhale any chemical directly. On occasion you may be directed to check an odor, but this is done by wafting the material toward you, not by placing your nose directly over the container and inhaling.
2.4.3. Never carry hot equipment or hazardous chemicals through a cluster of students.
2.4.4. Never add water to acids; you should add acid (slowly. Carefully, and with stirring) to water.
2.4.5. Use Bunsen burners only when directed by your instructor to do so.
2.4.6. When heating any chemicals (in a test tube or flask), be sure that it is an open system and that the opening is not directed toward yourself or other students.
2.4.7. Chemicals are generally transferred in the approximate amount needed and taken to the student's lab bench. Only use transfer techniques that have been demonstrated by your instructor. Never return chemicals to the original container because they could be contaminated. Instead, dispose of any excess or waste chemicals in the prescribed manner.
2.4.8. Moving chemicals from one place to another in the lab should generally not be necessary. If it is, it must be done very carefully.
2.4.9. NEVER PIPETTE BY MOUTH. Instead use a bulb or an automatic pipette.
2.4.10. Ordinarily you will not need to bend, break or insert glass tubing into rubber stoppers. If you do have occasion to do any of these activities, be sure to use the techniques demonstrated by your instructor.
2.4.11. If you have need to insert or remove an electrical plug, be sure that your hands are dry and apply pressure directly to the plug, not the cord.

2.5. Minimize risk and danger to self and others in case of an accident and when disposing of chemical waste.
2.5.1. Any chemical spills need to be reported to your instructor and cleaned up immediately using the appropriate neutralizing agents and/or disposal procedures.
2.5.2. If you get chemicals on your skin (hands, face or elsewhere) or clothes, wash immediately with copious amounts of water, and report the incident to your instructor.
2.5.3. Chemicals in your eye are very serious. Use an eye wash in the lab to irrigate the eye with water for several minutes; report the incident to your instructor.
2.5.4. If a glass piece of equipment is broken, use the brush and trash scoop in the lab (with the green/white container for broken glass) to clean up any glass. Dispose of broken glass in the box designated for that purpose.
2.5.5. If a person's hair or clothing catches fire, drop and roll to smother the fire. Another near-bye person should immediately get the fire blanket and assist with smothering the fire. The fire extinguisher can also be used. Report the incident to your instructor.
2.5.6. If chemicals or papers on your lab bench catch on fire, remain calm and attempt to smother the fire by placing a larger object (preferably inflammable) over it. A watch glass put over the top of a

small beaker containing burning liquid works wonders. The fire extinguisher may also be used. Report the incident to your instructor.

2.5.7. Report any accident such as burns, chemical contact with skin or clothes, cuts, or scratches, no matter how minor, immediately to your instructor.

2.5.8. If you notice smoke or fire, notify your instructor.

2.5.9. Follow your instructor's directions in the case of any accident and/or need to evacuate the lab.

2.5.10. For the disposal of chemical waste, follow directions given in the laboratory text and/or by your instructor. Some chemical wastes may be safely washed down the drain. However, many solid and liquid chemical wastes must be discarded into designated containers maintained in one of the hoods of each laboratory. Chemical wastes are not discarded in the regular waste containers. The latter are used exclusively for paper and plastic dry waste.

3. Safety Policies for Dr. Landrie's Students

3.1. No coats, book bags or personal belonging, other than a lab notebook and writing utensil, may be stored on lab benches or floors. All personal belonging must be stored in cabinets to prevent chemical contamination.

3.2. Keep track of your combination lock and ensure it is locked before leaving the lab. Combinations will be posted to D2L during the second week of classes.

3.3. Do not sit in stools when conducting an experiment. Stools are provided for non-laboratory activities only.

3.4. Ensure you are properly trained before using an instrument in the instrument lab (341). Ask your instructor if you unfamiliar with operating procedures.

3.5. Do not enter the research lab (342) unless accompanied by your instructor.

3.6. Each student must read the Hazard and Safety Information for every chemical they will use in experiments. This information is found online at http://www.chadlandrie.com/OCCcheminventory. This information must be summarized in the *Pre-Lab* section of their notebook entry.

I have received, reviewed, understand, and agree to follow these safety procedures for the chemistry laboratories.

CHM-Course:	221-Organic Chemistry I
Section-CRN:	1E1-20251
Instructor:	Dr. Chad Landrie

Drawer #:	
Combination Lock Serial #:	
Combination:	

Printed Name:	
Signature:	
Date:	

i>Clicker

I. Introduction

i>Clicker is a response system that allows you to respond to questions that are posed during lecture. Generally, 5-10 questions will be asked during each lecture to reinforce a concept just covered or to determine student's preconceptions and understanding of reading assignments. These questions will appear on the projector screen as part of the lecture slides. One point will be awarded to each student that answers the question; one additional point will be given for the correct answer. The questions may be reviewed later by downloading the lecture slides from the course website or by viewing the i>clicker page within the course website. In order to receive credit, you will need to register your i>clicker remote online according to the instructions in the following section.

II. Obtaining an i>Clicker

PURCHASE

You may purchase an i>clicker from the vendor's website (www.iclicker.com) or through Amazon.com. Either i>clicker 1 or i>clicker 2 may be purchased for this course. Once purchased, you may use your i>clicker in any of your classes requiring them that semester or in the future. Simply follow each instructor's registration instructions separately. You may also loan your i>clicker to peers for use in their classes; however, only one individual can use an i>clicker in a single class at a time. In other words, two students in the same class cannot share one i>clicker.

LOAN

Students that do not wish to purchase an i>clicker will obtain a loaned i>clicker from their instructor at the beginning of each class. The same i>clicker must be used throughout the semester. Be sure to make a note of the identification tag on the front of the i>clicker during your first use so that you are always using the same i>clicker for each class. At the end of class, the i>clicker must be returned to the instructor. If you purchase an i>clicker later in the semester and would like to use it instead of your loaned i>clicker, you must bring the purchased i>clicker to your instructor so it can be registered to your name.