

# Chemistry 3719

## Organic Chemistry 1

MWF 11.00-11.50; Rm B112 Cushwa Hall

**Dr. Peter Norris**

**Office:** 6014 Ward Beecher Hall

**Office Hours:** TWThF 12.00-1.00 or by appointment

**Telephone:** (330) 941-1553; **Email:** pnorris@ysu.edu

**Website:** <http://dr-peter-norris.com>

**Instagram:** @norrisorganicchem

**Textbook:** "Organic Chemistry" (3<sup>rd</sup> edition) by David Klein, Wiley publishers. The 2<sup>nd</sup> edition of the textbook is also acceptable (note differences with 3<sup>rd</sup>) and the study guide is recommended, as is the downloadable ChemDraw suite.

**Course Description:** Organic compounds, reactions and theories. Typical preparations and procedures of analysis. Prereq.: "C" or better in Chemistry 1516. Organic compounds form the basis of Biochemistry and Genetics, and organics are the backbone of the pharmaceutical and petroleum industries. The material covered in Chemistry 3719 and 3720 is also relevant to tests used for entry to professional schools in the United States (e.g. PCAT, DAT, MCAT, GRE).

**Course Objectives:** The focus of this course will be to help the student understand the underlying principles of Organic Chemistry. The student will be able to appreciate the relationship between the structure of an organic compound or intermediate and its physical, chemical, and/or spectroscopic properties. The course also provides a basis for other closely related fields that involve organic molecules such as Biochemistry. In the first semester we will cover Chapters 1-11 of the textbook, in that order.

### Course Content, Goals, Learning Objectives

Content	Goals	Learning Objectives
Chapters 1-2	Transition from General Chemistry to the Organic world by reviewing basic chemical concepts, trends, bonding patterns and molecular shapes.	To be able to understand the types of bonding that carbon participates in; use molecule shape and electronegativity to predict properties.
Chapter 3	Survey the common classes of organic acids and bases and their reactivity/stability; learn pK <sub>a</sub> values and their application in acid-base problems.	A sound understanding of the factors leading to reactivity and be able to apply pK <sub>a</sub> values to decide where an equilibrium will lie.
Chapters 4-5	To study the structures of organic molecules in detail as well as the devices used to convey shape and overall 3-dimensional geometry.	An ability to predict structure and geometry by knowing hybridization patterns; know how to work with chirality and stereoisomers.
Chapter 6	Cover the basics of chemical reactivity and organic mechanism; the devices used to express chemical change through making and breaking bonds.	Understand ideas of entropy and enthalpy as applied to organic molecules; be able to use curved arrows to express chemical change.
Chapter 7	To apply the curved arrow notation to substitution and elimination reactions; study the factors that lead to the change in reaction pathway.	Be able to recognize factors that differentiate between substitution and elimination routes; devise syntheses based on product needed.
Chapter 8	A detailed study of addition reactions of alkenes to give functionalized products; use of curved arrows to describe concerted and step-wise processes.	Assimilate the main alkene addition reactions into the synthetic toolkit; be able to predict outcomes and develop complex syntheses.
Chapter 9	Introduce alkynes as unsaturated carbon substrates; study their addition reactions and use as powerful carbon-based nucleophiles in synthesis.	Understand the central role of alkyne anions as nucleophiles in C-C bond construction; be able to incorporate into multistep synthesis.
Chapter 10	Study the radical-based reactions of simple organic substrates, including the stereo- and regiochemical possibilities and outcomes observed.	Be able to spot radical-based mechanisms, use the single-headed arrow notation, and apply radical chemistry to synthetic problems.
Chapter 11	To apply the reactions from the first semester to the task of multistep synthesis; planning sequences and producing end-products efficiently.	Develop an ability to synthesize molecules by employing reactions from the first semester; use retrosynthesis to ensure logical planning.

**Assessment:**

Term exams (3 x 100 pts)	300	
Final, comprehensive, exam	200	<i>Note: there will be no dropped exams in this course.</i>
Online WileyPlus Homework	100	<i>Note: must get at least 70/100 in lab to pass Chem 3719 overall.</i>
3719 Laboratory exercises	100	
<b>Total</b>	<b>700 pts</b>	

The approximate grading scale below will be used *with adjustments made as needed depending upon overall class performance and relative difficulty of exams:*

**Exam Schedule:****Grading Scale:**

Exam 1 (~Ch 1-4): <b>Fri 9/21/18</b>	<b>A</b> 630-700 pts
Exam 2 (~Ch 4-7): <b>Fri 10/19/18</b>	<b>B</b> 560-629 pts
Exam 3 (~Ch 7-10): <b>Mon 11/19/18</b>	<b>C</b> 420-559 pts
	<b>D</b> 349-419 pts
Final (Comprehensive): <b>Mon 12/10/18</b>	<b>F</b> <350 pts

**Online Resources:** The Norris website (<http://dr-peter-norris.com>) contains a large amount of information related to Chemistry 3719 and 3720 including copies of syllabi and links to other useful websites for Organic Chemistry students. A link to the ChemDraw software suite, which is available for download in Chemistry 3719 and 3720, is provided on the Courses page. Practice problems and old exams that complement the course sequence are linked on that same page (large Adobe Acrobat files).

**Request for "Incomplete":** A request for a grade of "Incomplete" (I) in the course will be considered only if more than 60% of the assignments have been completed as scheduled. An "I" will be submitted only when the cause is deemed justifiable and approved by both the instructor and the department chairperson (see *YSU Bulletin*). All incomplete work must be completed by May 1, 2019 otherwise the grade will become an F.

**Students with Disabilities:** In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course please contact me privately to discuss your specific needs. You must be registered with CSP/Disability Services and provide a letter of accommodation to verify your eligibility. You can reach CSP/Disability Services at (330) 941-1372.

**Statement of Non-Discrimination:** Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit [www.yzu.edu/ada-accessibility](http://www.yzu.edu/ada-accessibility) for contact information for persons designated to handle questions about this policy.

**Academic Misconduct:** You are referred to the online YSU Student Code of Conduct (found on the YSU website at: <https://cms.yzu.edu/administrative-offices/student-conduct/student-code-conduct>) for an account of the consequences associated with any academic misconduct. Any attempts at cheating in Chemistry 3719/3719L/3719R will be dealt with severely. If you are caught cheating, for example for copying a lab report, for looking at someone else's paper during an exam, or for using an electronic device during an exam or quiz, **you will at least be given an F grade for the 3719/ 3719L course.** For exams, please bring with you a means of photographic identification; this will be checked at the end of the test. Since the professor grades all of the exam papers any examples of copying will be discovered and dealt with. Be aware that random pages of completed tests will be photocopied. **Do not jeopardize your future by cheating.**