Chemistry 6941: Advanced Organic Chemistry I

M,W 6:35-7:50 pm Williamson 2203

Instructor: Professor Douglas T Genna

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*“Asking a question may lead to a temporary embarrassment, but not asking the question will lead to a permanent embarrassment”*

**General**

This course is a survey of advanced organic chemistry focusing on transformations that you would not normally be exposed to during the undergraduate sequence. Topics of discussion will include but are not limited to: physical organic chemistry, aldol reactions and their derivatives, olefinations, sigmatropic reactions, reductions, oxidations, and cross coupling reactions. The goal of this course is to introduce you to new forms of organic chemistry while enhancing your chemical critical thinking skills.

Prerequisite: I will expect you to know the following concepts: 1) SN2, SN1, El, and E2 mechanisms. 2) definitions of nucleophile, electrophile, leaving group. If you are not comfortable with these concepts please review them and bring yourself up to speed.

**Textbooks**

Advanced Organic Chemistry, Fifth Edition. Part A and B. Carey and Sundberg. *This book is freely available through Ohio Link on the Maag Library Website*

Strategic Applications of Named Reactions in Organic Synthesis. Kurti and Czako. ISBN-13: 978-0124297852.

**Learning Outcomes:**

1. Develop critical thinking skills as it applies to organic chemistry
2. Develop critical thinking skills necessary to plan experiments to support mechanistic hypotheses
3. Develop scientific writing skills
4. Develop the ability to determine the most important aspects of a scientific article

**Grades**

The course will be out of a total of 800 points.

Organic 1 Final (1/23/2023)

Exam 1 – 100 pts (2/27/2023)

Exam 2 – 100 pts (4/12/2023)

Final – 200 pts (5/3/2023) 6:00-8:00 pm

Literature Assignments – 100 pts

Homework – 100 pts

Participation – 100 pts

*Participation:* This is a graduate course, so I expect participation from the class. If you come prepared to class (having read the assigned readings), ask and answer questions, participate in discussions then you will receive the max 100 points. This is an easy 100 points don’t waste them.

*Organic 1 Final:* On the first day of class I will present you with a final exam from my organic chemistry 1 class. You will have two weeks to complete it and bring it back. You can use any resources (except other students) to complete it. It’s open book, open notes, etc. Though the original exam is scored on a 200 point scale, it will be corrected down to 100 points for your class work.

*Exams:* There will be two in class exams and a final on the above dates and they will be pertinent to the material that we are currently discussing in class. As we get closer to exams more information will be provided.

*Homework* will be assigned one week prior to its due date. There will be five assignments each worth 20 pts. You will receive the graded homework back from the next class period.

|  | **Assigned** | **Due** |
| --- | --- | --- |
| **HW 1** | 1/25/2023 | 1/30/2023 |
| **HW 2** | 2/8/2023 | 2/13/2023 |
| **HW 3** | 3/15/2023 | 3/20/2023 |
| **HW 4** | 4/5/2023 | 4/10/2023 |
| **HW 5** | 4/17/2023 | 5/3/2023 |

*Literature Assignments:*

In organic chemistry more than any other chemical discipline it is imperative to stay up-to-date in the current chemical literature. To help aid your immersion in the current literature throughout the course of the semester you will have to choose a current article and write a 1-page maximum summary with schemes. You will have to do this four times. I will provide an example towards the first due date. The paper you choose should be from one of the following journals: Journal of the American Chemical Society, Angewandte Chemie International Edition, Journal of Organic Chemistry, Organic Letters, Chemical Communications, Chemical Science, Nature, or Science. The only requirement for the article is that it was published within the calendar year and it is related to organic chemistry. I do not have to approve your article ahead of time, but if I don’t and I deem it not appropriate for the course, then your grade will reflect this.

Your one page summary should include the following:

1. Relevant background information/historical context.
2. A discussion on why this particular paper/reaction is important
3. The highlights and findings of the paper (substrate scope, reaction shortcomings)
4. Reaction mechanism, if not provided be prepared to perhaps offer one if applicable
   1. Do they perform any mechanistic studies?
5. Are there any failings in the paper? Are there conclusions accurate?

You are not allowed to copy and paste schemes, you have access to chemdraw, so redraw them yourself.

As a written assignment your goal should be to write as a scientist would. Do not use colloquialisms, do not over rely on the first person (especially since this work is not your own).

The first summaries I will be highly critical, but lenient on grading. If there isn’t improvement in the highlighted areas between assignments your grade will reflect that as well (i.e. items I am lenient on in the beginning, I will not be lenient on as the semester goes on).

The due dates for the literature assignments are below:

|  | Due |
| --- | --- |
| Lit 1 | 2/8/2023 |
| Lit 2 | 3/1/2023 |
| Lit 3 | 3/29/2023 |
| Lit 4 | 4/26/2023 |

# Statement of Non-Discrimination from the University:

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 the Equal Opportunity and Policy Development & Title IX website for contact information for persons designated to handle questions about this policy.

**Student Accessibility**

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. To coordinate reasonable accommodations, you must be registered with the Accessibility Services, located in Kilcawley Center Room 2082. You can reach Accessibility Services at 330-941-1372

**Academic Integrity/Honesty**

As outlined in The Student Code of Conduct, all forms of academic dishonesty are prohibited at Youngstown State. This includes plagiarism, the unauthorized use of tools or notes in taking tests or completing assignments, fabrication of data or information used for an assignment, working with others without permission from the instructor, and more. A student who is believed to have violated the academic integrity policy will meet with the instructor to discuss the allegations. The student may accept responsibility for the violation and any sanctions selected by the instructor, or they have the right to ask for a hearing before a hearing panel. The full Academic Integrity Policy can be found in Article III of The Student Code of Conduct, while further information on University procedures for alleged academic integrity violations can be found in Article V.

If you are caught cheating, you will at least be given an F grade on that particular assignment and perhaps for the entire course. Do not jeopardize your future by cheating.

**Incomplete Grade Policy**

An incomplete grade of “I” may be given to a student who has been doing satisfactory work in a course, but, for reasons beyond the control of the student and deemed justifiable by the instructor, has not completed all requirements for a course when grades were submitted. A letter grade MAY NOT be changed to an “I” (Incomplete) after the term has ended and grades have been recorded. For Fall Term courses, the final date to complete an “I” will be March 1 of the following term; for Spring Term courses, September 1; for Summer Term courses, October 1. These dates can only be extended with the approval of the instructor and the Dean of the College where the course is taught. Forms for extension of the deadline may be obtained and after obtaining the proper signatures, this form must be submitted to the University Records office 24 hours before the original deadline (i.e. for Fall Term courses, March 1 of the following term).

**Classroom Safety and Health Protocols (COVID-19)**

Youngstown State University has been and will continue to implement evidence-based protocols to monitor and suppress coronavirus in accordance with public health guidelines. YSU will work directly with local public health officials to determine what guidelines are appropriate to implement within the context of our local community and will update protocols as needed. Faculty and students are expected to abide by all safety and health policies implemented by the University’s Office of Environmental Occupational Health and Safety as well as all applicable local, state, and federal mandates. YSU recommends that all faculty and students become fully vaccinated. Everyone must continue to perform a daily health assessment and report COVID through the reporting form to YSU COVID Support Staff. The following COVID-19 protocols must be considered during the current coronavirus pandemic for Fall 2021 instruction.

**GENERAL CLASSROOM GUIDELINES**

All individuals, regardless of vaccination status are required to wear face coverings in indoor public settings on campus

Individuals on campus are encouraged to physically distance according to their personal needs

Disinfecting wipes/sprays will be provided in classrooms that are used for face-to-face course instruction

Faculty and students should wipe down their work areas at the beginning and end of each class

Any concerns/issues should be communicated immediately to EOHS

**INSTRUCTOR SAFETY PROCEDURES**

Faculty must use assigned seating in their classrooms to help contact tracing if a fellow classmate were to be exposed to COVID-19

Daily attendance must be performed to determine which students are present for the class to help contact tracing fellow classmates

Faculty should use hand sanitizer before and after touching computers or other shared classroom items.

Faculty using classroom technology such as computers should sanitize the keyboard, mouse etc. prior to use

**STUDENT SAFETY PROCEDURES**

Students must always follow the YSU Safety and Health Guidelines while on campus and attending class

Students should wash their hands frequently in between classes and use hand sanitizer as needed

If you must cough or sneeze, be sure to cover your mouth even with a mask on, using your arm at the elbow joint

Given the uncertainties surrounding the ongoing coronavirus pandemic, these protocols are subject to change based on state and federal health guidelines. Changes will be communicated promptly through the usual communications channels. Please visit the University Coronavirus Information page for more information.