

Chemistry 295: Introduction to Research Independent Study: Fall 2021

Class Meeting: Monday, 6:00 – 7:15 PM, FFSC 2237

Instructors: (1) Prof. Ross A. Widenhoefer; 2101 FFSC; Tel: 660-1533; e-mail: rwidenho@chem.duke.edu and (2) Jodi Psoter; Tel: 660-5926; jodi.psoter@duke.edu

Course website. This course will use Sakai for posting relevant course information and announcements.

Information about Chemistry 295. Chemistry 295 will meet in person on Mondays from 6:00 - 7:15 PM in FFSC 2237. The topics to be discussed and the assignments are shown on the schedule provided below. This 0.5 credit course is graded using standard letter grades and also provides 0.5 course credit toward the writing requirement (W) for graduation. Students who do not need the writing credit and would prefer to take the course graded S/US should follow the usual procedure. Chem 295 is required for all majors who intend to pursue a BS degree in chemistry with ACS certification and/or who intend to pursue graduation with distinction in chemistry. Although the stated co-requisite for CHEM 295 is "registration for a first course in research independent study in chemistry (CHEM 393) or a related area," the two courses may be taken in different semesters and independent study need not be taken for credit. The minimum requirement is that students enrolled in CHEM 295 work with a faculty mentor to select a topic area for investigation. Any student who is not enrolled in independent study concurrently or has not yet started independent study should see Prof. Widenhoefer at the end of the first-class meeting.

Textbook. No textbook is required for this course. Selected readings are provided online. The department also has a few used copies of A Short Guide to Writing About Chemistry, by H. Beall and J. Trimbur, which may be borrowed for reading.

Assignments. Details are provided in the course syllabus and in each class period. In the first section of the course, Prof. Widenhoefer (RW) and chemistry librarian Jodi Psoter (JP) will present lectures concerning the use of library sources, reading the literature, navigating and searching chemical databases, creating a bibliography, laboratory safety, and the ethics of scientific research. The assignments associated with this portion of the course will focus on collecting primary references that define the proposal topic area, creating a bibliography, and student group presentations on laboratory safety and the ethics of scientific research. The second portion of the course will focus on the process of writing an independent research proposal, which you will complete by the end of the semester and which represents the majority of your CHEM 295 grade. Each week, Prof. Widenhoefer will provide instruction on writing one section of the proposal (See the Guide for Writing a Research Proposal for Chemistry 295) and students will prepare a draft of this section which will be distributed in the following class period for peer evaluation and feedback. Depending on the length of the section, your draft will be evaluated by one or two of your classmates and conversely, you will provide feedback on one or two of your classmate's drafts. Peer feedback rubrics will be provided to focus and structure the comments of peer feedback. Each student will then revise their draft, taking into account the comments of your peers. The peer feedback forms will also be uploaded to the Sakai site via the "Assignments" tab and will constitute a portion of your participation grade for the course.

Class participation. Class participation is a significant component of the course, especially for the group presentations in the first half of the class and the peer feedback workshops in the second half of the

course. Students who are unable to attend a class are expected to inform Prof. Widenhoefer by email prior to the absence, along with/followed by a short-term illness form, a religious observance form, or an athletic participation form that is acceptable within the Community Standard.

Course Grades. This course is graded using regular letter grades or satisfactory/unsatisfactory with a grade of satisfactory being equivalent to C– or better. The assignment of points is shown below. There are no quizzes or exams in this course.

		Points
Research Proposal	1. Title and Abstract	10
	2. Introduction	10
	3. Literature Review	10
	4. Methods	10
	5. Results	10
	6. Bibliography and Citations	5
	7. Appendix A	5
	8. Appendix B	10
Group reports & presentations	• Safety – case presentation	10
	• Ethics in research – case presentation	10
Class Participation	• Class attendance and participation	10
	• Peer feedback	15
Total		115

Duke Reader Project. Chem 295 will participate in the Duke Reader Project, which offers you the opportunity to obtain feedback on your proposal from a Duke alumnus or employee who has professional experience relevant to your project. *Participation in the Duke Readers Project is optional*, but highly encouraged. If you decide to participate, you must sign up and will be matched with a volunteer who has professional experience related to your project. After you have been matched with a volunteer, the expectation of the Duke Reader Project is that you will (1) initiate an introductory meeting where you and your reader get to know each other and discuss your writing assignment; (2) e-mail a draft of the *Introduction* and *Literature Review* sections of your proposal to your reader (11/01), who will provide feedback within a week through written comments and/or in person (virtual) meeting; and (3) e-mail a draft of your full proposal to your reader (11/22), who will provide feedback both on the revisions you have made to the *Introduction* and *Literature Review* sections and provide additional comment on the *Methods* and *Results* section of the proposal, again through written comments and/or in person (virtual) meeting. To sign up for the Duke Readers Project and learn more about the program visit <https://sites.duke.edu/dukereaderproject/>.

Sample Research Proposals. Examples of meritorious CHEM 295 research proposals from past years are provided on Sakai.

Tentative Schedule for CHEM 295, 2021 Fall

Class	Date	Workshop Topics	Assignment
1	8/23	<ul style="list-style-type: none"> • Introduction (RW) • Use of library source and course guide (JP) • Appendix B (JP/RW) 	<ul style="list-style-type: none"> • Identify your project and primary reference • Install Endnote and ChemDraw • Set up a SciFinder account
2	8/30	<ul style="list-style-type: none"> • Reading the literature (JP/RW) • Safety discussion (RW) 	<ul style="list-style-type: none"> • read primary reference • Submit part 1 of Appendix B (sakai)
3	9/6	<ul style="list-style-type: none"> • Endnote, Web of Science and Pubmed (JP) 	<ul style="list-style-type: none"> • Collect primary references • Submit part 2 of Appendix B (sakai) • Schedule initial meeting with Duke Reader (optional)
4	9/13	<ul style="list-style-type: none"> • Scifinder (JP) and Reaxys (RW) 	<ul style="list-style-type: none"> • Prepare safety presentations
5	9/20	<ul style="list-style-type: none"> • Safety presentations (S) 	<ul style="list-style-type: none"> • Continue searching and reading references, submit Appendix B (sakai), and create endnote library
6	9/27	<ul style="list-style-type: none"> • Ethics discussion (RW) 	<ul style="list-style-type: none"> • Prepare ethics presentations
	10/4	<ul style="list-style-type: none"> • Fall Break - no class 	
7	10/11	<ul style="list-style-type: none"> • Ethics presentations (S) 	<ul style="list-style-type: none"> • Read and annotate primary references
8	10/18	<ul style="list-style-type: none"> • Proposal – Overview and Introduction (RW) • Discussion of Peer feedback/rubrics (RW) 	<ul style="list-style-type: none"> • Prepare draft of <i>Introduction</i>
9	10/25	<ul style="list-style-type: none"> • Literature review (RW) • Effective use of graphics (RW) • Peer feedback – <i>Introduction</i> (S) 	<ul style="list-style-type: none"> • Prepare draft of <i>Literature Review</i> • submit peer feedback of <i>Introduction</i> (sakai)
10	11/1	<ul style="list-style-type: none"> • Methods section (RW) • Peer feedback – <i>Literature Review</i> (S) 	<ul style="list-style-type: none"> • Prepare draft of <i>Methods</i> • submit peer feedback of <i>Lit. Review</i> (sakai) • Submit Introduction and Literature Review to Duke reader (optional)
11	11/8	<ul style="list-style-type: none"> • Results section & Appendix A (RW) • Peer feedback – <i>Methods</i> (S) 	<ul style="list-style-type: none"> • Prepare drafts of <i>Results</i> and <i>Appendix A</i> • submit peer feedback of <i>Methods</i> (sakai)
12	11/15	<ul style="list-style-type: none"> • Abstract and Title (RW) • Peer feedback – <i>Results & Appendix A</i> (S) 	<ul style="list-style-type: none"> • Prepare draft of <i>Abstract and Title</i> • submit peer feedback of <i>Results & Appendix A</i> (sakai)
13	11/22	<ul style="list-style-type: none"> • Peer feedback – <i>Abstract and Title</i> (S) 	<ul style="list-style-type: none"> • submit peer feedback of <i>Abstract and Title</i> (sakai) • Submit full proposal to Duke reader (optional)
14	11/29	<ul style="list-style-type: none"> • Final Proposal Due 	<ul style="list-style-type: none"> •