CHEM 446 (substitute for **CHEM 490), Chemistry Seminar I, Spring 2023 (1 Credit)**[1]

0.1 | Basic Course Information

***Seminar meeting time and location*:** Friday 1:50 – 2:50 p.m., Halsey Science 456

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Course Description

The student will work with a faculty adviser to prepare a major research paper involving the student's own research or a critical analysis of recent scientific literature on an agreed-upon chemical topic. Students will also prepare a resume. Prerequisite: Chemistry 370 or consent of instructor. Note: This paper will form the basis for the oral seminar you give in CHEM 491

Learning Objectives – Upon successfully completing CHEM 490 you will be able to:

1) Retrieve specific chemical information from the chemical literature
2) Read and understand technical material
3) Prepare effective written scientific papers
4) Find career opportunities for persons with chemical training

Attendance Policies

Whenever possible, you are expected to attend class synchronously, either onsite or virtually. There are several excused reasons for which you may need to miss class, including health issues, childcare issues, and university-sanctioned activities such as field trips. If you need to miss a class during our regular meeting time, please let the instructor know via email as soon as possible. To make up an excused absence, a student must (1) watch the video recording of the seminar; (2) complete an evaluation form for the seminar (if a student seminar); and (3) write a two-page report (double spaced, 12 point font, 1 inch margins) containing a summary of the presentation, and at least two questions that you would have to asked the speaker. This report is due within one week of the absence.

0.2 | Academic Honesty, Integrity, and Fairness

The University of Wisconsin Oshkosh is built upon a strong foundation of integrity, respect, and trust. All members of the university community have a responsibility to be honest and the right to expect honest from others. Any form of academic dishonesty is unacceptable to our community and will not be tolerated. The State of Wisconsin Administrative Code states: "Students are responsible for the honest completion and representation of their work, for appropriate citation of sources and for respect of others' academic endeavors." (§ UWS 14.01)

Plagiarism (representing the work/words of others as your own) or cheating on any assignment will lead to a zero on that assignment, with no opportunity for a make-up or extra credit. The best way to avoid issues of plagiarism is keep track of all sources you read or skim, and work through multiple rough drafts with your advisor. Offenses will be reported to the Dean of Students. A second offense will lead to an F in the course and disciplinary action by the Dean of Students. These sanctions will be applied in accordance with state statutes as specified in UWS 14.01 – 14.06. For more details see the information on the Dean of Students Office website and the portions of Wisconsin State Law referenced there.

[1] This syllabus is based on syllabi shared by past instructors of the Chem 490 seminar course. Note that this Spring 2023 version is highly edited and cut due to this course being run as independent study instead of Chem 490/491.

0.3 | Participants and Responsibilities

Role of the Seminar Director

The seminar director is responsible for scheduling seminars and for helping students find suitable topics and advisors. The seminar director has the ultimate responsibility for assigning course grades.

Role of the Faculty Advisors

Each student will choose or be assigned a faculty advisor who will help determine a suitable topic and guide the student in preparing the seminar paper and oral presentation. In CHEM 490, the student and faculty advisor are expected to meet at least six times during the semester. The faculty advisor will submit periodic reports to the seminar director to indicate the student's level of performance, and whether the student has met the deadlines (see schedule).

Role of the Student

Each student is responsible for scheduling all appointments with his or her seminar advisor and for meeting all deadlines. The student must ensure that the paper is professionally written.

0.4 | Evaluation of Performance

Final papers will be evaluated on the basis of their content, quality of writing, and the degree to which they meet the indicated guidelines (e.g. length and appearance, use of suitable references, etc.). Refer to the attached Seminar Evaluation Form and Rubric for more information. The student's seminar advisor will critically read the paper and recommend a grade to the seminar director. Based on this recommendation, as well as their own evaluation of the paper, the seminar director will assign a preliminary grade for the paper. The preliminary grade will be adjusted for any demerits due to late assignments. To obtain a passing grade, students must meet with their advisor a minimum of six times (pass/fail) and complete the following assignments (all but final paper are pass/fail):

- Literature Search – finding at least 5 key references
- Annotated Bibliography
- Career Planning Exercise
- Resume
- Outline of Paper
- 5 Page Draft
- 15 Page Draft
- 20-25 Page Final Paper

A deduction of one-third of a grade from your final grade (i.e. final grade = A; with no resume submitted then the final grade becomes an A-) will be applied for each missed assignment or meeting. Each unexcused absence from class or absence that is not made up will result in a reduction by one-third of a letter grade. Five absences, whether excused or not, may constitute failure for the course.

Written work, ACS Formatting, and Turnitin: All written assignments should be constructed and edited using appropriate academic writing style, spelling, grammar, and punctuation. All assignments should use American Chemical Society (ACS) format for in-text citations and the reference list, unless you and your advisor specifically agree upon another format consistent with a peer reviewed journal. A quick summary of ACS reference formatting style for the endnote list may be found here: https://pubs.acs.org/doi/full/10.1021/acsguide.40303. All assignments will be automatically submitted to Turnitin via Canvas.

Incompletes: Incompletes will be granted only when required by University policy. Specifically, the student must have completed two-thirds of the assigned work. This consists of a 15 page rough draft of the seminar paper, which the student's advisor and the seminar director deem acceptable. If the student does not meet these requirements, he or she will receive a failing grade. Exceptions will be

made only in cases of illness or injury. A student with an Incomplete grade in CHEM 490 may not register for CHEM 491 Chemistry Seminar II.

0.5 | Process for Creation of a Seminar Paper

Writing a research paper is a multi-step process. This semester in CHEM 490, you will select an advisor and topic, and then follow the steps listed in the diagram below to develop your topic from an idea into your final paper.

Selecting an Advisor and Topic

A seminar paper describes recent research in Chemistry or in a closely related field. Students who have done or are currently doing research may write a paper on their own and related research, provided that their research advisor agrees. In such a case, the student's research advisor will also act as the seminar advisor. Students who will not be describing their own research should discuss possible topics with faculty members before making a selection. The topic is expected to evolve as literature references are studied. If you are not sure who would be an appropriate advisor for your preferred topic, contact the seminar director before or immediately following the first seminar meeting for assistance in finding an advisor. A seminar topic should meet the following criteria: (1) It has a substantial component of chemistry; (2) It concerns research near the forefront of science which is described in recent articles from the primary literature; (3) The seminar director approves the topic; and (4) a faculty member is willing to act as an advisor.

Literature Search - Find References

Reference types: References can be classified as primary, secondary, tertiary, and quaternary. Primary references include articles in peer-reviewed journals that publish original scientific papers (*e.g., Journal of the American Chemical Society*). Secondary references include single-topic review articles or monographs (*e.g., Accounts of Chemical Research*, *Chemical Reviews*). Usually, the author of a secondary reference is an active researcher in the field. Tertiary references include textbooks (*e.g., Advanced Organic Chemistry*) and specialized encyclopedias (*e.g., Encyclopedia of Chemical Technology*). Quaternary references include most encyclopedias, all news articles, and most general articles in trade magazines (*e.g. Chemical and Engineering News*).

Each student is to rely, for the most part, on **recent primary chemical literature**. References to secondary literature are appropriate but should be limited. References to tertiary and quaternary literature should be kept to an absolute minimum.

How to Find References: The internet has many sources of information, but few are peer reviewed so should be used cautiously. The best way to identify chemistry references is with a **SciFinder search** of the Chemical Abstracts and MedLine databases. Web of Science is also another website that searches databases. Polk Library offers access to other research databases for STEM, such as Web of Science, which might be better depending on your discipline. You should discuss with your advisor which database is the most useful for you to search. The Canvas class site has a link you can use to create a SciFinder account. The account works on UW Oshkosh computers; if you are off campus, log in through the Polk Library website. If you need assistance with the search, schedule a meeting with your advisor, the seminar director, or a reference librarian. Another way to identify appropriate references is to start with a key reference and find the references that its authors cited. You can then take those papers and look up their references. You can find newer articles that cite your key reference by using Web of Science, part of Web of Knowledge. Use the link in Canvas and then click on *subscriber login*. No password is required.

How to Get the References that You Need: Many journal articles are available electronically via the Polk library website or in the library's physical holdings. If Polk library does not have what you need, you may order the article through their interlibrary loan program. Articles usually arrive in a few days. However, for some items (especially books) it may take longer. Universal Borrowing, from other UW System institutions, may be a faster way to get books.

Annotated Bibliography

Each student is expected to prepare a well-researched, scholarly paper. To help with this, you will be creating an annotated bibliography where you will read current articles from the primary literature, then use your own words to describe experiments and their results. In addition, you should analyze the information, using your own knowledge of chemistry to make significant conclusions. Compile the citations for the references you want to use for your paper, using American Chemical Society format (see the *ACS Quick Style Guide, https://pubs.acs.org/doi/full/10.1021/acsguide.40303*). For each reference, do the following:

- List what information from the article will be used in your seminar paper (i.e. synthetic steps & spectra for a molecule; instrument design)
- Explain why you find the reference to be interesting
- Explain how the information in the reference is relevant to your paper topic.

Outline

The next stage in writing the paper is to organize your information by creating an outline. Create your outline from the information in your annotated bibliography. Papers will need an introduction which provides context for their topic, including the background and significance; the main body which describes experiments and discusses results; and a conclusion in which you apply your knowledge of chemistry to analyze, synthesize, and interpret the information, drawing conclusions about the current state of research on the topic and describing areas in which more research is needed. Other headings and subheadings may be used to help the reader understand the organization of your paper.

Formatting Guidelines for Drafts and Final Paper

Following the outline, you will be submitting a 5-page draft, a 15-page draft, and the final 20-25 page finished paper. All submissions must be double-spaced, in 12 point font, with 1 inch margins, and at least 23 lines of text per page. Indent new paragraphs rather than skipping lines, unless you are starting a new section. To avoid plagiarism be sure that ideas and information, in addition to direct quotes and paraphrases, from references are indicated with in-text citations (superscript numbers in the order the references are first used that match the numbering of the endnote list).

The **Final Paper** will include:

1. A title page with the title, the author's name, the name of the faculty advisor, and an abstract of 80 to 120 words in length.
2. The text of the paper which typically contains the following sections: Introduction, Results and Discussion, and Conclusion. More sections and subsections can be used as needed. The paper should be 20-25 pages long, excluding the title page, references, figures, and tables.
3. A list of references as the last section (endnotes), in an appropriate format (ACS).
4. All figures and diagrams must be attached at the end of the manuscript. These do not count toward the 20-25 pages. Number each figure (Figure 1, Figure 2, etc.) and provide a caption.

The evaluation form and rubric that will be used to grade your paper is attached to the end of this syllabus.

0.6 | Specific Activities in CHEM 490

Due Date	Milestones for this course
2nd Class	Find a faculty member who agrees to act as your seminar advisor. Select a **topic** with your advisor and formulate an overall plan for the paper (1st meeting). Submit your topic and advisor's name on Canvas.
Before 3rd Class	Meet your advisor to plan and execute an online literature search (2nd meeting). Submit exported results of SciFinder search with at least five promising articles, and your search terms (words, phrases, structures, CAS numbers, etc…).
Before 4th Class	Read papers and submit an annotated bibliography, *in ACS format*, of at least five key references (from primary or secondary scientific literature). Share the references and bibliography with your advisor.
Before 5th Class	Meet your advisor to discuss your bibliography, decide if more references are needed (3rd meeting).
Before 5th Class	Submit a draft resume.
Before 6th Class	Submit a detailed outline and share it with your advisor.
Before 7th Class	Meet your advisor to discuss your outline and plan your draft (4th meeting).
Before 8th Class	Submit a draft of your paper (at least 5 pages). Share it with your advisor.
Before 9th Class	Meet with your advisor to discuss your 5 page draft (5th meeting).
Before 10th Class	Submit a 15 - 20 page draft. Share it with your advisor.
Before 11th Class	Meet with your advisor to discuss your 15 page draft (6th meeting).
Before 13th Class	Submit your final, 20-25 page paper. Provide a copy to your advisor.

0.7 | Required Regulatory Statement

"Students are advised to see the following URL for disclosures about essential consumer protection items required by the Students Right to Know Act of 1990: https://uwosh.edu/financialaid/consumer-information/."

0.8 | Other Useful Information

Respecting the diversity of our community

Diversity drives innovation, creativity, and progress. At the University of Wisconsin Oshkosh, the culture, identities, life experiences, unique abilities, and talents of every individual contribute to the foundation of our success. Creating and maintaining an inclusive and equitable environment is of paramount importance to us. This pursuit prepares all of us to be global citizens who will contribute to the betterment of the world. We are committed to a university culture that provides everyone with the opportunity to thrive. Therefore, all members of our community are expected to treat each other with respect and apply intellectually rigorous critical analysis to all their interactions with others (e.g. activities, discussions, arguments, etc...).

There are lots of support services on campus

If you have an emergency, mental health issue, suffer harassment, have food insecurity, …, see the campus resources information ("Where to get help…") in the class Canvas site.

0.9 | Seminar Paper Evaluation Form

Student Name Advisor Semester

_? _**1. Format**
☐ Typed, double spaced
☐ 12 point type
☐ 1 inch margins
☐ at least 23 lines of text per page
☐ Page numbers
pages long (body 20-25 pages)
☐ title page
☐ reference list
☐ figures and tables attached

? **2. Organization**
Title page:
☐ Title
☐ Author's name
☐ Advisor's name
☐ Abstract (80-120 words)
Text with subsections, at least:
☐ Introduction
☐ Experiments & Results
☐ Conclusions

? 3. Grammar & Spelling

? 4. Mathematical Representations

? 5. Quality Figures & Tables
☐ captioned
☐ support the text

? 6. Citations/References
☐ mostly primary sources
☐ mostly recent sources
☐ cited in text
☐ ACS format

? **7) Scientific Accuracy**

? 8) Depth of Coverage

? 9) Synthesis and Interpretation

rubric for evaluation of seminar paper content (categories 6-9)

Expectations for paper content	Advanced	Intermediate	Novice	Unsatisfactory
6. Citations and References	mostly primary mostly recent cited in text ACS format	mostly primary mostly recent cited in text ACS format	5 primary + recent; minor errors in citation, reference format	< 5 primary + recent or failed to cite a reference
7. Scientific Accuracy	no significant errors	few errors in advanced material	minor errors in material covered in classes	major errors in material covered in classes
8. Depth of Coverage	information not familiar to professors	information rarely covered in classes	mostly information covered in classes	fails to explain how experiment connects to results and conclusions
9. Synthesis and interpretation	beyond what is presented in references	minor misunderstanding	only repeating references	serious misunderstanding

seminar paper grading scale

A range	B range	C range	D range	F
≥ 20 pages long; no more than 1 error in categories 1-5; advanced in categories 6-9	≤ 2 errors from categories 1-5; at least intermediate in categories 6-9	≤ 4 errors from categories 1-5; intermediate in at least two of the categories 6-9; no unsatisfactories	≤ 6 errors from categories 1-5; at least novice in categories 6-9	fails to meet the D range requirements

Comments

Advisor Recommended Grade ?

Final Grade from Director (includes demerits for missed deadlines) ?