

# CHEM 689 Syllabus - Cooperative Education in Chemistry

**Instructor:** Al Fischer, PhD

**Office Hours:** By appointment at [calendly.com/dralfischer](https://calendly.com/dralfischer) (Meet on MS Teams)

**Availability:** See my calendar

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**Course Information:** [alphonse.github.io/chem689](https://alphonse.github.io/chem689)

## Overview

*CHEM 689 - Cooperative Education in Chemistry* provides graduate students with an applied project or internship focused on the management, upkeep, and business aspects of a chemical analysis lab. This may include maintaining instruments, developing methods, conducting literature searches and market research, developing price structures, and/or developing new instrumentation, dependent on student interest and project availability. The course satisfies the applied project/internship component of the Chemistry M.S. Professional Science Concentration. Students are required to work a minimum of 120 hours to satisfy the 6 credit hour internship. The scheduling and duration will be negotiated and approved by the student, the student's faculty advisor, and the internship supervisor. Prerequisites include a minimum of 9 hours of graduate courses, minimum B average in graduate work, and approval of department head, advisor, and cooperative education coordinator.

## Student Learning Outcomes

To achieve a *satisfactory* grade, students will:

- Demonstrate an ability to perform routine upkeep of scientific instrumentation and/or ability to train others on the use of chemical instrumentation.
- Develop a routine method for analytical services of a specific type (e.g. "cannabinoid analysis", "natural product screen in species X", or "water quality analysis") and/or develop new analytical equipment.
- Conduct a cost analysis and develop pricing for the proposed method and/or equipment.
- Communicate the method, cost analysis, and proposed pricing in a written report.

## Required Course Materials

**Technology:** Students will need a laptop computer meeting Chemistry and Physics' minimum computer requirements. A web browser and internet connection will be necessary for communicating with your instructor. Microsoft Teams will be used for tracking time, tasks, and communicating with your instructor. It is recommended that students install the Microsoft Teams desktop and/or mobile app(s) on their device(s). MS Teams is available for installation through the WCU Office365 web portal.

A standard office suite (e.g. word processor, spreadsheet program, etc) will be necessary for completing work.

**Lab Notebook:** A laboratory notebook will be provided for you. The notebook remains property of WCU and must be relinquished to your instructor at the end of the semester.

### Personal Protective Equipment:

- **Gloves** will be provided for you and should be worn when necessary.
- **Goggles/Safety Glasses** can be provided if you do not already have your own. You must wear goggles at all times while in the lab.
- **Lab Coats** can be provided if you do not already have your own. You should wear one when working with especially hazardous chemicals, especially concentrated acids and bases.

### Other Protective Equipment:

- **Face Masks** must be worn at all times. Surgical-style or N95 masks are preferred as these are most effective at blocking aerosols. Neck gaiters should be avoided. Please see “Masking for a Friend” to learn where to get masks if you don’t have any.

## COVID19 Policies

This course will use a *Hybrid Face-to-Face* format, meaning that students can expect >50% of course activities to occur in person. During all in-person meetings, students *must*:

- Wear a face mask at all times (see “Masking for a Friend” statement below).
- Practice social distancing (maintain a distance of 2 meters from other individuals as much as possible).
- Practice good hygiene practices and follow CDC guidelines to minimize spread of COVID19.
- Avoid coming to class if you experience and cold, flu, or COVID19 symptoms, have been diagnosed with COVID19, or have been in contact with someone who’s tested positive for COVID19 within the last 14 days.

Note that these policies are subject to changes as the COVID19 pandemic grows or shrinks and recommended best-practices continue to develop.

### Masking for a Friend

As the WCU Community Creed articulates, members of the WCU community are expected to live by high standards of academic and personal integrity and embrace their responsibility as a member of the Catamount community. In recognition of this responsibility, and in response to the best available science and current guidance from the Centers for Disease Control and Prevention, every student must wear a mask or other cloth face-covering that covers their nose and mouth while in this classroom. Students who do not have a mask will be asked to leave the classroom and only return when they follow this basic public health recommendation. Following this simple, science-based guideline will help ensure the safety of the entire Catamount community.

Note that masks do little to protect the person wearing the mask; rather, they minimize the chances that someone who is already sick will spread the disease to others. When you come to class in your mask, you’re not only protecting your friends, peers, and instructors in the room with you, but also their friends, family, and loved ones, especially those in high-risk populations. Students who miss class because they are not wearing a mask will not be able to make up the work missed. Students who do not have masks can obtain them at the locations below:

- University Center - Main Information Desk (2nd floor)
- Hunter Library - Circulation Desk
- Belk Building – CET Dean’s Office (Room 161)
- Health and Human Sciences Building – CHHS Dean’s Office (Room 201)
- Biltmore Park Instructional Site – 3rd floor Information Desk

# Grading

## Grading Methods

This course is graded on a Satisfactory/Unsatisfactory (S/U) scale. Neither S nor U is used in calculating the GPA, but an S allows hours of credit while a U does not.

Your final grade will be judged based on: (1) your punctual completion of laboratory responsibilities; (2) your log sheets; (3) your laboratory notebook; (4) your final report and summary data. A general plan for the specific nature of these items will be discussed at the beginning of the semester, but is subject to change as necessary throughout the semester.

Each of these 4 categories is worth 100 points; your final grade will be determined by taking the weighted average of the four categories (weightings in parentheses below). **You must have an average >82.9 to receive an 'S' in the course.**

1. **Laboratory Responsibilities (35%):** You will be assigned certain upkeep and/or training responsibilities each week that are meant to give you an idea of what it takes to keep an instrumentation facility running. You must check off these tasks in Microsoft Teams each week *after* you've completed them. If you fail to complete your tasks your instructor may have to complete them for you, in which case you will have points deducted from your grade.
2. **Log Sheets (10%):** Time sheets are kept electronically in Microsoft Teams.
3. **Notebooks (20%):** You will be issued a laboratory notebook. You should follow the the CHEM 689 Lab Notebook Guidelines found on the course website. Electronic data (spectra, chromatograms, spreadsheets, etc.) should be stored on the NEON server without exception. All data files and your notebook remain property of WCU and must be turned in by the end of the semester.
4. **Final Report (35%):** Your final report is due the day before finals start at 23:59:59 via email. Please see Dr. Fischer's writing tips for guidelines. Specific requirements may vary based on your project and will be determined on a case-by-case basis.

## Course Policies

**Communication:** Maintaining open communication is essential! Please communicate regularly with your instructor using email or Microsoft Teams, email, and/or in person. Please check your email and Microsoft Teams regularly throughout the semester for messages from your instructor.

**Attendance:** Your attendance will be monitored via your time logged in Microsoft Teams. You are expected to work at least 120 hours to satisfy the attendance requirements. For a 1-semester internship, this corresponds to about 9 hours per week. Scheduling and duration will be negotiated and approved by the student, the student's faculty advisor, and the internship supervisor.

*If you experience any symptoms of COVID-19, cold, flu, or other contagious sickness please do NOT come to lab! Likewise, do not attend if you have been in contact with someone who has tested positive for COVID-19 or is suspected to have COVID-19. Please maintain diligent communication with your instructor during these situations and appropriate accommodations will be made.*

You should arrange *excused absences* with your instructor *ahead of time*. An excused absence is any official University-sanctioned event, a contagious sickness, or medical issue that either presents a severe limitation to your ability to attend class or puts the health/safety of others in the class at risk. You are responsible for completing work missed during your absence.

**Laboratory Safety:** Each student **must** complete research lab safety training each semester. This training will be completed in person. You will verify your training via an online survey no later than the end of the second week of classes. All safety procedures must be followed at all times. This includes wearing long pants, closed-toe shoes, safety glasses or goggles (depending on the work you're doing) and gloves (when necessary).

Lab coats may be required when working with strong acids or bases. Any noxious or volatile chemicals must be used only in a fume hood. All waste must be disposed of properly; if you have any questions about waste disposal please ask your instructor or the Research Operations Manager.

**Instrument Safety:** Students should not use instruments that they have not been trained on. If you are unsure how to complete a task on an instrument ask your instructor for clarification or training. It is better to do something late after asking for help than to do something wrong and damage an instrument. Students should keep the instruments they use and the space around clean and free of clutter.

**Chemical Hygiene:** The instrumentation lab is a common area shared by many students and faculty. Students should leave their workspace clean at all times. Dirty glassware should be cleaned before leaving for the day, shaken dry, and immediately put away. All chemicals and samples must be clearly labeled at all times; the label should include the name of the compound, the user's initials, and the date. Samples should never be left in any instrument or autosampler, except when actively running. Weekly cleaning duties may be assigned as needed and failure to complete your assigned tasks will negatively impact your grade.

**Laboratory Access:** The instrumentation lab is open from 8AM to 5PM daily. Students should arrange to complete their lab work during this time, and should not be in the lab after hours (except under special circumstances with prior arrangement). A key may be obtained from Ms. Diann Ferguson in the Chemistry Main Office; a \$10 deposit is required.

**Inclement Weather & Other Emergencies (including COVID19):** Please check the University website for campus closings during times of bad weather, local, state, or national emergencies, and/or pandemics. Your health and safety is a priority when traveling. Use common sense when attempting to get to campus and notify your instructor if you are unable to safely make it. Announcements will be made via e-mail and/or Microsoft Teams if class must be canceled when the University has not officially closed and/or if we are otherwise unable to meet in person.

**Composition-Condition Marks:** Proper mastery of the English language will be considered when assessing written work. A student whose written work fails to meet acceptable standards will be assigned a composition-condition (CC) mark by the instructor on the final grade report. All undergraduates who receive two CC grades prior to the semester in which they complete 110 hours at WCU are so notified by the registrar and are required to pass English 300 or English 401 before they will be eligible for graduation. This course must be taken within two semesters of receiving the second CC and must be passed with a grade of C (2.0) or better. Students needing assistance with writing are encouraged to get help from WaLC. All written work submitted for this class may be checked with SafeAssign.

## Institutional Policies

**Course Recording and Broadcasting:** Students may make visual or audio recordings (Recording) of any class related content, using any approved recording device (e.g., smart phone, computer, digital recorder, etc.) upon the **prior permission of the instructor** and subject to the following restriction(s). The Recording, along with the video capture of visible course materials (e.g., visible PowerPoint slides and/or visible lecture notes), shall be limited to the student's personal, course related, educational use and shall be subject to all applicable copyright laws and institutional policies. The student may not transfer, transmit, or otherwise disseminate the Recording to any third party, including classmates, without the permission of the instructor. Any violation of these restrictions, or any other restriction verbally communicated by the instructor, may subject the student to the provisions of the WCU Academic Integrity Policy, the WCU Code of Student Conduct or both.

**Accommodations for Students with Disabilities:** Western Carolina University is committed to providing equal educational opportunities for students with disabilities. The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights for persons with disabilities. Among other things, this legislation requires that students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Office of Accessibility Resources located in Killian Annex or call

828-227-2716. For additional information, visit [go.wcu.edu/oar](http://go.wcu.edu/oar).

**Academic Integrity Policy and Reporting Process:** This policy addresses academic integrity violations of undergraduate and graduate students. Graduate students should read inside the parenthesis below to identify the appropriate entities in charge of that step of the process. Students, faculty, staff, and administrators of Western Carolina University (WCU) strive to achieve the highest standards of scholarship and integrity. Any violation of the Academic Integrity Policy is a serious offense because it threatens the quality of scholarship and undermines the integrity of the community. While academic in scope, any violation of this policy is by nature, a violation of the Code of Student Conduct (Code) and will be addressed as outlined in that document. If the charge occurs close to the end of an academic semester or term or in the event of the reasonable need of either party for additional time to gather information timelines may be extended at the discretion of the appropriate academic Dean. Instructors have the right to determine the appropriate academic sanctions for violations of the Academic Integrity Policy within their courses, up to and including a final grade of “F” in the course in which the violation occurs.

Definitions:

- *Cheating:* Using, or attempting to use, unauthorized materials, information, or study aids in any academic exercise.
- *Fabrication:* Creating and/or falsifying information or citation in any academic exercise.
- *Plagiarism:* Representing the words or ideas of someone else as one’s own in any academic exercise.
- *Facilitation:* Helping or attempting to help someone to commit a violation of the Academic Integrity Policy in any academic exercise (e.g. allowing another person to copy information during an examination).

Additional information is available on the Student Success website under Student Community Ethics: <http://www.wcu.edu/experience/dean-of-students/academic-integrity.aspx>.

**Community Vision for Inclusive Excellence Statement:** The diverse perspectives encountered at WCU are an important part of the preparation of students for roles as regional, national, and global leaders who contribute to the improvement of society. It is expected that members of the WCU community will not only coexist with those who are different from themselves, but also nurture respect and appreciation of those differences. We encourage civil discourse as a part of the learning enterprise, and as a campus we do not tolerate harassing or discriminating behavior that seeks to marginalize or demean members of our community. WCU encourages all to clearly express their own views while at the same time seeking to understand the varieties of style, identity, and opinion that are held in any diverse community. In order for us to sustain a learning environment that promotes and values freedom of expression, we have a shared charge to accept personal responsibility for our actions, reactions, and speech, while seeking to learn from the actions, reactions, and speech of others.

## Student Resources

The Writing and Learning Commons (WaLC) located in Belk 207, provides free course tutoring, writing tutoring, writing fellows, Supplemental Instruction, academic skills consultations, international student consultations, and online writing resources for all students. To schedule appointments for any of these services, visit [tutoring.wcu.edu](http://tutoring.wcu.edu) or call 828-227-2274.

The Mathematics Tutoring Center in 214 Killian Annex provides free drop-in tutoring for mathematics courses and subject matter, course-specific tutoring appointments, and graduate and professional exam preparation resources.

In addition to services provided by the WaLC and MTC, students also will have access to non-WCU tutors through Brainfuse.

**Academic Calendar:** The University academic calendar can be found at [wcu.edu/learn/academic-calendar.aspx](http://wcu.edu/learn/academic-calendar.aspx). It includes dates for all breaks, University closures, final exams, etc.

**Final Exam:** The University final exam schedule can be found on the [wcu.edu/learn/academic-services/registrars-office/](http://wcu.edu/learn/academic-services/registrars-office/).

## Syllabus Updates

This syllabus and the course schedule are subject to revision as needed. Students will be notified of changes and are responsible for adhering to the modifications.