

Instructor: Dr. Joe Burnett
Office: 1608 Gilman Hall
Phone: 515/294-7815
Section 1: MW 11 am - 11:50 am, Gilman 1652
Office Hours: M 1:30 - 3:30 PM, R 2 pm - 4 pm, and by appointment
Office hour location: 1101 Gilman
E-mail: joechem@iastate.edu
Pronouns: He/Him/His

Teaching Assistants: Hayley Masching
Office hour location: 1101 Gilman
Office Hours: T 11 am - 12 noon & R 12 noon - 2 pm
E-mail: hayleym@iastate.edu
Pronouns: She/Her/Hers

Learning Outcomes: Students will develop an understanding of the fundamental principles of quantitative analysis in analytical chemistry, including key concepts such as calibration, standardization, and the principles underlying various analytical techniques. Students will

- acquire skills in data analysis and interpretation, including statistical methods for evaluating the precision and accuracy of analytical measurements,
- learn the basic principles of common analytical methods including titrations, chromatography, spectrophotometry, and electrochemical methods, and
- gain an appreciation for and understanding of the significance of analytical chemistry in diverse fields such as environmental monitoring, pharmaceuticals, food analysis, art restoration, and forensic science.

Course Description: Theory and practice of elementary volumetric, chromatographic, electrochemical and spectrometric methods of analysis. Chemical equilibrium, sampling, and data evaluation. Emphasis on environmental analytical chemistry; the same methods are widely used in biological and materials sciences as well. Prerequisites for Chem 211 include Chem 163 & 163L, Chem 167, Chem 178, or Chem 201 & 201L and concurrent enrollment in CHEM 211L. Chemistry 211 is a 2-credit course. (**Attendance is highly recommended; attendance quizzes and in-class activities represent a portion of the overall grade**).

IMPORTANT: Chem 211 and 211L are co-requisite courses, i.e., students in Chem 211 are required to take Chem 211L at the same time or to have already received credit in 211L. Co-requisite course requirements are strictly enforced: Students who do not meet the co-requisite should drop the course or they will receive an F in the course. Students who drop or audit Chem 211 will be required to drop 211L and vice versa. Students may not register to audit Chem 211 after January 29th. The audit does not count towards full-time student status. To add or drop recitation or lab sections during the first week of class, use AccessPlus. After the first week, please email amwade@iastate.edu or call 515/294-6361. The last day to drop CHEM 211 and 211L is March 29th.

Optional Weekly Review Sessions: Fridays from 11 am – 12 noon in Gilman 0611. Hayley will conduct recitation-style review sessions weekly. Attendance is encouraged but not required. At these meetings, problem-solving and connecting concepts to problem solving will be emphasized. Attendees should expect a workout and are expected to actively participate.

Required Materials:

- **Textbook:** "Exploring Chemical Analysis," 5th edition by Daniel C. Harris. The e-book is automatically purchased and accessible through the "Immediate Access Course Materials" link on the CHEM 211 Canvas page. See the last page of the syllabus for information about the ISU Immediate Access Program. Students may opt out of immediate access if they prefer to purchase a physical copy of the text.
- **Scientific Calculator** (with the functions: $\ln(x)$, e^x , 10^x , y^x) is essential. Graphing calculators are permitted.

Office Hours: all TA and instructor office hours are held in 1101 Gilman.

Monday	1:30 - 2:30 pm	Joe
Tuesday	11 am - 12 noon	Hayley
Thursday	12 noon - 2 pm	Hayley
Thursday	2 - 4 pm	Joe

Attendance: In-class assessments using Top Hat are part of the grade for the course. Top Hat exercises make up 5% of the final grade. At the end of the semester, a minimum of the lowest 5 Top Hat scores will be dropped. This policy gives students the flexibility to miss up to five classes without impacting their overall grade.

Assignments: Homework assignments/problem sets will be posted weekly on Canvas and **are due Fridays at 5 pm** - no exceptions, no excuses.

Problem Sets: Problem sets are handwritten (or typed) solutions to questions that are submitted on Canvas as a CLEAN and CLEAR PDF. (iPhones have a camera to pdf converter – visit the following link for instructions: <https://support.apple.com/en-us/HT210336>). On Android phones, several free apps are available on GooglePlay (Adobe Scan and Simple Scanner work easily and well). Parks Library, most public libraries, and various campus copiers have photocopiers with scanning capabilities.

Grading of problem sets: Each question on a problem set will get a score of 0 (no reasonable attempt), 1 (reasonable attempt, but not correct), or 2 (fully correct); so each problem is worth 2 points. Collaboration is encouraged; feel free to work with other students on the homework, but you must turn in your own individual set of solutions. Answers to problem sets will be posted after the class when the assignment is due. Problem sets account for 15% of the grade. At the end of the semester, the three lowest problem set scores will be dropped (the 12 top scores count towards the final grade).

The purpose of dropping the three low scores on homework quizzes and problem sets is to allow you to have 3 free passes for when you cannot turn in your homework on time. We encourage you to complete and turn in all homework sets, because it is a good way to learn and keep up with the material. Students who submit all 15 homework sets AND score better than 60% on all of them will have 5% added to their overall problem set score.

Note: Illegible exams or problem sets will NOT be graded. Photo submissions of problem sets will not be graded (problem sets must be submitted as legible PDFs). All work must be presented reasonably, neatly, and logically; all work MUST be shown. A correct answer without supporting work will receive a score of 0. Solutions to problem sets MUST be listed in the order given on the assignment.

- **No credit will be received for late assignments – late submissions of online quizzes or problem sets will not be graded (without documented extenuating circumstances or an emergency).**

Exams: There will be three one-hour exams (each worth 20% of the final grade) and a *comprehensive* final exam (20% of the final grade). Exam dates are listed below.

Exam 1 Monday Feb 19

Exam 2 Monday Mar 25

Exam 3 Monday Apr 29

Final Exam: R 5/9 @ 7:30 AM (cumulative)

Legal Cheat-sheet: (AKA Quick Reference Card) You will be provided with a card-stock legal cheat sheet for use on all exams and quizzes. You may write anything on the document with one rule - **it must be handwritten in non-erasable INK**. You may use both sides of the page. Instructors & your TA may make spot checks throughout the semester. If you lose your cheat sheet, you will NOT receive a replacement; however, each exam will contain a periodic table and all needed data, equations, and constants, so losing the card stock version will only mean you lose access to your notes. Producing a replacement or using pencil or erasable ink to subvert these rules constitutes academic misconduct. **A periodic table and all needed equations and constants and data will be provided on all of the exams.**

All exams, including the final exam, will be retained by the course instructor. Students will have opportunities to view the graded exams.

Make-up exams will be administered only in exceptional cases, which must be discussed with the instructor and which absolutely require documentation. In some cases, at the instructor's discretion, in lieu of a make-up exam, the final grade may be comprised of the remaining requirements, each taking on a proportionally higher weighting. **All students (including graduating seniors) MUST take the final exam.**

ISU final examinations policy will be followed absolutely: <http://www.registrar.iastate.edu/students/exams>. Students who have three or more finals on the same calendar day may request to reschedule a final. The instructor of the course having the smallest number of students is responsible for arranging an alternate examination time for the student unless make-up exam times are available in one of the other courses. Alternative final exam times will only be scheduled for students with a conflicting final exam time or those with three or more finals scheduled for the same days as listed above (and with Chem 324 as their smallest course). There will be no exceptions. **The deadline to request an alternative time for the final exam is 11 am on Friday Apr 26 at 10 am.**

The Final Exam will be a cumulative standardized American Chemical Society (ACS) multiple-choice exam. Students who miss the final exam will fail the class.

Regrades on exams or homework assignments: Students have a deadline of **2 weeks** following an exam or homework assignment to request a regrade. Regrade requests must be limited to the correction of errors in grading. After 2 weeks, scores are set.

Grading: The grades are determined as follows: 15% from homework problem sets, 5% from in-class Top Hat exercises and on-line self-assessments and quizzes, 20% from each of the three one-hour exams and 20% from the final exam. Plus-minus grading will be used for the final grade. Grades are based upon straight percentages with the following scale. The instructor reserves the right to modify the grading scale. Final grades are not negotiable.

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
>93.29	90.0– 93.29	86.7– 89.99	83.3– 86.69	80.0– 83.29	76.7– 79.99	73.3– 76.69	70.0– 73.29	66.7– 69.99	63.3– 66.69	60.0– 63.29	<60.0

Canvas: <https://canvas.iastate.edu/> Canvas will be used for posting of scores and grades and will be central to disseminate information (such as lecture notes and problem sets) and announcements for the class. It is the student's responsibility to check posted grades for accuracy. Any student who discovers an error in a grade on Canvas **MUST** bring the graded work to the attention of a teaching assistant or the course instructor **within 2 weeks** of submission of the work.

Illness or emergencies: If you have a health issue or emergency that requires you to miss multiple classes, you are advised to contact the Office of Student Assistance (<https://cyclonesupport.iastate.edu/>) and your academic adviser to keep them informed of your situation.

Order of Events (tentative):

Ch 0: The Analytical Process	Ch 11: Polyprotic Acids & Bases
Ch 1: Chemical Measurements	Ch 17: Instrumental Methods in Electrochemistry
Ch 3: Math Toolkit	Ch 18: Let There Be Light
Ch 4: Statistics	Ch 19: Spectrophotometry: Instruments & Applications
Ch 5: Quality Assurance & Calibration Methods	Ch 20: Atomic Spectroscopy
Ch 6: Good Titrations	Ch 21: Principles of Chromatography & Mass Spectrometry
Ch 8: Introducing Acids & Bases	Ch 22: Gas & Liquid Chromatography
Ch 9: Buffers	Ch. 23: Chromatographic Methods & Capillary Electrophoresis
Ch 10: Acid-Base Titrations	

Note that this list and ordering of chapters/topics is subject to change.

Important Dates in the Semester

Jan 22:	Last day to drop a course and not appear on permanent record. Last day to change schedules using AccessPlus
Jan 29:	Last day to audit a course. An audit does not count towards full-time student status
Feb 19:	Exam 1
Feb 26-Mar 8:	Mid-term evaluations administered on Class Climate
Mar 8:	2:15 pm – Mid-term reports due (C-, D, F grades are reported)
Mar 11-15	Spring Break (no classes)
Mar 25:	Exam 2
Mar 29:	Last day to drop a course or withdraw without extenuating circumstances
Apr 1:	10⁶-point midterm examination
Apr 19-May 3:	End of semester course evaluations administered on Class Climate
Apr 26:	Last day to request an alternate time to take the final exam in case of conflicts*
Apr 29:	Exam 3
Apr 29-May 3:	Prep Week (formerly known as Dead Week)
May 9:	Cumulative Final Exam 7:30 am Thursday

*ISU final examinations policy will be followed absolutely: <http://www.registrar.iastate.edu/students/exams.>

SYLLABUS STATEMENTS ON SAFETY, BEHAVIOR, RESPECT, AND UNIVERSITY POLICIES

Accessibility Statement

Iowa State University is committed to advancing equity, access, and inclusion for students with disabilities. Promoting these values entails providing reasonable accommodations where barriers exist to students' full participation in higher education. Students in need of accommodations or who experience accessibility-related barriers to learning should work with Student Accessibility Services (SAS) to identify resources and support available to them. Staff at SAS collaborate with students and campus partners to coordinate accommodations and to further the academic excellence of students with disabilities. Information about SAS is available online at www.sas.dso.iastate.edu, by email at accessibility@iastate.edu, or by phone at 515-294-7220. **Students with academic accommodations MUST communicate with the course instructor.**

Religious Accommodation

Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. In all cases, you must put your request in writing. The instructor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course. For students, you should first discuss the conflict and your requested accommodation with your professor at the earliest possible time. You or your instructor may also seek assistance from the Dean of Students Office (<https://www.studentassistance.dso.iastate.edu/>) at 515-294-1020 or the Office of Equal Opportunity (<https://www.eoc.iastate.edu/>) at 515-294-7612.

Discrimination and Harassment

Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. Veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, 3410 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, Tel. 515-294-7612, Hotline 515-294-1222, email eooffice@iastate.edu.

Prep Week

This class follows the Iowa State University Prep Week policy as noted in section 10.6.4 of the Faculty Handbook, (<https://www.provost.iastate.edu/faculty-and-staff-resources/faculty-handbook>).

Mental Health and Well-Being Resources

At Iowa State, we're committed to your success and well-being. As a Cyclone, you can access 24/7 resources, services, and people dedicated to helping you achieve your goals and be your best in and out of the classroom. Whether you need academic support or just someone to talk to, we're here for you at Cyclone Support (cyclonesupport.iastate.edu).

- Wellbeing resources for students: <https://www.cyclonehealth.iastate.edu/wellbeing-resources/>
- Student Wellness call (515) 294-1099 or via the website (<http://studentwellness.iastate.edu>);
- Thielen Student Health Center call (515) 294-5801 (24/7 Medical Advice) or via the website (<http://www.cyclonehealth.org>);
- Student Counseling Services call (515) 294-5056 or via the website (<https://counseling.iastate.edu>)
- Recreation Services call (515) 294-4980 or via the website (<http://recservices.iastate.edu>)
- Students dealing with heightened feelings of sadness or hopelessness, thoughts of harm or suicide, or increased anxiety may contact the ISU Crisis Text Line (Text ISU to 741-741) or contact the ISU Police Department (515) 294-4428.

Public Health

If you are not feeling well, please stay home and focus on your health. Should you miss class due to illness, it is your responsibility to work with your instructor to arrange for accommodations and to make up coursework, as consistent with the instructor's attendance policy. **Public health information for the campus community continues to be available on Iowa State's public health website. All public health questions should be directed to publichealthteam@iastate.edu.**

COVID-19 Information (Thielen Student health Center): <https://health.iastate.edu/covid-19-information/>

Classroom etiquette, mutual respect and professionalism

You are expected to treat your instructor and all other participants in the course with courtesy and respect. Please refrain from distracting behavior during class (talking, texting, watching videos, etc.). It is the instructor's goal to promote an atmosphere of mutual respect in the classroom. Please contact the instructor if you have suggestions for improving the classroom environment.

Name, gender identity and/or gender expression

Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me accordingly early in the semester so that I may make appropriate changes to my records.

Academic Dishonesty

The class will follow Iowa State University's policy on academic misconduct (5.1 in the Student Code of Conduct). Students are responsible for adhering to university policy and the expectations in the course syllabus and on coursework and exams, and for following directions given by faculty, instructors, and Testing Center regulations related to coursework, assessments, and exams. Anyone suspected of academic misconduct will be reported to the Office of Student Conduct in the Dean of Students Office: <https://www.studentconduct.dso.iastate.edu/academic-misconduct/armfacultystaff>. Information about academic integrity and the value of completing academic work honestly can be found in the Iowa State University Academic Integrity Tutorial: <https://iastate.pressbooks.pub/academicintegrity/>.

Free Expression

Iowa State University supports and upholds the First Amendment protection of freedom of speech and the principle of academic freedom in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.

This course is enrolled in the Iowa State University Immediate Access Program.

What is Immediate Access? Immediate Access is a collaborative affordability initiative between the ISU Book Store, faculty and publishers. Students that are enrolled in an Immediate Access course will receive access to all required digital course materials the first day of class and at a reduced cost compared to the national average.

What is the title and price of the required content for this course? This information is posted in your student booklist through Access Plus. Prices will also be listed in a Welcome email you will receive one to two weeks prior to the start of classes.

How is Immediate Access billed? You will be automatically charged on your u-bill for this digital content. The billing description on your ubill will show the department and course number, followed by "IMMED ACCESS" and the last 4 digits of the billing ISBN. Below is an example of the billing description for a student enrolled in PSYCH 101.
"PSYCH 101 IMMED ACCESS 6131"

What if I drop the course? Students who drop the course within the first 10 days of class will receive a refund on their u-bill (5 days for courses 8 weeks or shorter). YOU DO NOT HAVE TO NOTIFY THE BOOKSTORE IF YOU DROP THE COURSE. This is an automated process.

Can I opt out of Immediate Access? Students may choose to opt out of the program. Opting out does not mean you are dropping the course. It simply means you are choosing not to receive the digital content from the bookstore and you must find another way to acquire it in order to complete required homework assignments. Students have within the first 10 days of class to opt out and receive a refund to their u-bill (5 days for courses 8 weeks or shorter). Instructions on how to opt out will be emailed shortly before classes start.

How do I access the required digital content? There is a tool on the Navigation Menu of your Canvas course called Immediate Access. You will receive an email shortly before class's start that will instruct you on how to access the required digital course materials. You may not be able to access the digital content until the first day of class.

For more information on Immediate Access go to <https://www.isubookstore.com/immediate-access-students>