CHM2096: APPLIED GENERAL CHEMISTRY 2 - SPRING 2026

CLASS #: 18508, 18514, 18515, 18516, 18517, 18518

INSTRUCTOR INFORMATION

INSTRUCTOR

Instructor	Email	Phone	Office Hours
Dr. Korolev Instructional Professor	Canvas email preferred korolev@ufl.edu	352-392-1087 (email preferred)	MWF 1:55pm-3:30pm in LEI400 and by appointment

TEACHING ASSISTANTS

Teaching Assistants: TBA. You will meet your assigned teaching assistant at your first discussion section. Teaching assistants will hold office hours on Mondays 5-7pm in the Chemistry Learning Center (CLC) in SFH 105. You can get help from any of the CHM2045/CHM2046/CHM2095 teaching assistants in the CLC.

GENERAL INFORMATION

COURSE DELIVERY/MEETING TIMES

Lectures will be held in FLI 50 from 12:50pm to 1:40pm on Mondays, Wednesdays, and Fridays. Discussion sections will be held in person on Thursdays at the time listed on your schedule. Exams will be held on campus in the evening assembly periods, E2-E3, on the dates listed in the course schedule in the syllabus.

CREDITS/REQUISITES

3 Credits. Prerequisites: CHM2045 or CHM2050 or CHM2095 with a minimum grade of a C, and MAC1147, or MAC1140 plus MAC1114, or higher MAC course with a minimum grade of a C. Corequisite: CHM2096L.

COURSE DESCRIPTION AND GOALS

This course constitutes the second semester of the two-term sequence of Chemistry I & II. As both a general education requirement and major's course, CHM2096 serves to teach the scientific method, skills for problem solving, general chemistry knowledge, and a connection to the principles that govern the natural world. Students will acquire knowledge of chemical equilibria, acid-base and solubility equilibria, entropy, free energy, electrochemical devices, solution dynamics, and descriptive inorganic and organic chemistry; all are taught in an engineering case-study context. Students participate in class discussions throughout the semester to reflect on pertinent topics and apply mathematical knowledge and reasoning to solve chemical problems. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena. Specifically, students will be able to:

1. Clearly communicate in writing information derived from course related readings/lectures about the major concepts and themes in the chemical sciences.
2. Apply knowledge of the fundamental principles of chemical, acid/base and aqueous equilibria to perform related calculations and make predictions of system behavior.
3. Describe and apply the fundamental principles of kinetics, thermodynamics, and electrochemistry.
4. Describe the properties of complex ions and coordination compounds.
5. Analyze chemical principles in engineering applications and identify the importance of elements in nature and industry.
6. Apply general chemistry knowledge to solve engineering problems

GENERAL EDUCATION OBJECTIVES AND LEARNING OUTCOMES

Primary General Education Designation: Physical Sciences (P) (area objectives available here). A minimum grade of C is required for general education credit. Courses intended to satisfy the general education requirement cannot be taken S/U.

Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

In General Chemistry I, these objectives will be met as detailed below. At the end of this course, students will be expected to have achieved the following learning outcomes in content, communication, and critical thinking: The course objectives align with the UF General Education student learning outcomes and physical science area learning outcomes:

General Education SLO	Physical Science SLO	Course Objective Alignment	Assessment
Content	Identify, describe, and explain the basic concepts, theories and terminology of natural science and the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant processes that govern biological and physical systems.	Objectives 1-5	All assessments offer opportunities for students to demonstrate content knowledge.
Critical Thinking	Formulate empirically-testable hypotheses derived from the study of physical processes or living things; apply logical reasoning skills effectively through scientific criticism and argument; and apply techniques of discovery and critical thinking effectively to solve scientific problems and to evaluate outcomes.	Objectives 1-5	All assessments offer opportunities for students to demonstrate critical thinking skills.
Communication	Communicate scientific knowledge, thoughts, and reasoning clearly and effectively.	Objective 6	Mini-project assignments

STUDENT LEARNING OUTCOMES

A complete list of student learning outcomes is posted in Canvas, organized by chapter.

REQUIRED & RECOMMENDED COURSE MATERIALS

TEXTBOOK (ONLINE E-BOOK WITH HOMEWORK; REQUIRED)

We will be using the Pearson Learning – Mastering Chemistry online homework system for regular homework this semester. The Pearson Learning software comes with the E-book, Chemistry: A Molecular Approach, 6e by Nivaldo Tro.

There are two options for purchasing access to homework/E-book: Option 1: consent to have the purchase price charged to your student account following the directions posted on the course homepage in Canvas; this is a time-limited option after which only Option 2 is available. Option 2: purchase an access code for the materials at the UF Bookstore (at a slightly higher price).

To opt in, navigate to: https://bsd.ufl.edu/allaccess. Click the "Opt In" tab or view the "View Eligible UF All Access Classes" button. You will be prompted to log in using Gatorlink credentials. Follow the prompt to authorize charges to your student account. The access code will then be provided. Copy the access code to your clipboard. In the Canvas course, click on the Mastering module, and provide the access code when prompted to do so. If you have any questions about the authorization process or refunds contact Included@bsd.ufl.edu.

A paperback version of the text is completely optional. The bookstore may stock paper versions of the text, or you can order one directly through the Pearson website. A paper version is on reserve at the Marston Science Library for reference purposes.

CALCULATOR (REQUIRED, MUST PURCHASE)

You will require a non-graphing, non-programmable scientific calculator capable of logarithmic functions.

ICLICKER (REQUIRED, NO CHARGE)

You will use iClicker to answer in-class clicker questions. Access is provided free of charge to students. An access code will be sent in the first week of the semester to all students via email. You will use your own device (phone, tablet, or laptop) during class to answer clicker questions with iClicker.

COURSE FEES

This course has an additional fee of $1.03.

COURSE COMMUNICATIONS

GENERAL OR ACADEMIC QUESTIONS

General course questions and all academic inquiries should be posed to your instructor during office hours, or to TAs during their office hours or during discussion sessions. Please be prepared before coming to office hours. Emails are for administrative purposes only, and not for distance-instruction.

PRIVATE OR GRADE-RELATED QUESTIONS

Direct private or grade-related to your instructor via the mail function in Canvas. Do not email outside of Canvas to your instructor's external email address – we aren't permitted to discuss grade related questions outside of Canvas. You will be asked to resend the query through Canvas. Instructor response time to email queries is <48 h during the workweek, or the first business day for emails received Friday or over the weekend. Grades will not be discussed during office hours due to FERPA regulations.

NETIQUETTE

All members of the class are expected to follow rules of common courtesy in all email messages, discussions, and chats. Please be mindful of your comments and responses, and make sure that they are respectful and inclusive to all participants.

TENTATIVE SCHEDULE

The following table outlines the order of topics/chapters for the semester. A detailed daily course schedule is found at the end of the syllabus. Unforeseen circumstances including university closure (weather related, etc.) may necessitate a schedule adjustment. Any changes will be communicated promptly to students.

Dates	**Topics**	**Tro 6e Chapter**
Jan 12	Introduction and Kinetics review	Chap. 15
Jan 14 – Jan 23	Equilibrium	Chap. 16
Jan 26 – Feb 4	Acids & Bases	Chap. 17
Mon, Feb 9	**Progress Exam 1 (8:20pm-10:20pm)**	**Cumulative**
Feb 6, Feb 11 – Feb 20	Ionic Equilibria	Chap. 18
Feb 23 – Mar 2	Thermodynamics	Chap. 19
Mon, Mar 9	**Progress Exam 2 (8:20pm-10:20pm)**	**Cumulative**
Mar 4 - 6, Mar 11 - 27	Electrochemistry	Chap. 20
Mar 30	Metals & Metallurgy	Chap. 25
Apr 1 – Apr 6, Apr 10	Transition Metals & Coordination Compounds	Chap. 26
Wed, Apr 8	**Progress Exam 3 (8:20pm-10:20pm)**	**Cumulative**
Apr 12 – Apr 20	Radioactivity & Nuclear Chemistry	Chap. 21
Apr 22	Organic Chemistry	Chap. 22
Mon, Apr 28	**Final Exam (12:30pm-2:30pm)**	**Cumulative**

COURSE POLICIES

ASSIGNMENT DUE DATES

All due dates for assignments are clearly posted in the course assignments of the Canvas page and reflect the most up-to-date information. All assignments must be completed by the stated due date and time for credit. A Dean of Students note verifying documentation of illness or personal matter must be provided for at least five of the seven days of the week of the assignments' deadline for accommodations to be considered.

PRE-LECTURE ASSIGNMENTS

You are expected to complete pre-lecture assignments in preparation for each class day. These assignments are based on the reading in the recommended textbook and provided videos. Each assignment has problems that match the content for you to master the content before class. These assignments will be posted on Canvas under the quizzes tab and are due prior to class. You will have multiple attempts to successfully answer the pre-lecture assignments. Three of these assignment grades are dropped from your overall course grade. Estimated time to complete pre-class work is approximately 20 minutes for each lecture.

ENGINEERING MINI-PROJECTS

Part of your grade will be determined by completion of engineering mini-projects during your discussion sections. There will be three projects spread over the semester that will relate to material covered in lecture. Each project will be completed over three weeks to be done both during discussions and outside the discussions. You will be graded on the scientific merit of your work in groups. More of the details of the activities will be discussed during the first class meeting on August 31st (discussions do not meet during add/drop on August 24th). Your attendance is required in your registrar assigned section. If you have an unexcused absence during the discussion period for a given week, then you will score a 0 on the assignment for that week. Estimated time to complete engineering mini-projects is 1 hour a week.

ENGINEERING ASSIGNMENT

2% percent of your course grade will be based on the final engineering assignment due toward the end of the semester. This is a written assignment that asks you to highlight a general chemistry topic that is applied in the field of engineering that you are interested in. You will describe the chemical process in detail, including its application, and include sources of information. More details will be provided during the semester.

ACHIEVE HOMEWORK ASSIGNMENTS

Online homework assignments through Achieve are due three times per week, typically 2-3 days after lecture. You have multiple attempts at each homework assignment, with the highest score counting for credit. Three homework assignment scores are dropped from your overall course grade. You can access homework via the Canvas course under Modules. There are also some introductory assignments on Achieve that contribute to your grade. Estimated time to complete homework assignments is approximately 1 hour per assignment.

ICLICKER

IClicker is a classroom response system used for in-class participation during lectures. The in-class questions will be presented during class in-pace with the lecture. You can earn points in class by correctly answering clicker questions through iClicker. iClicker points will begin counting after add/drop is over, on August 30th. The lowest three clicker grades will be dropped at the end of the semester.

QUIZZES

There will be periodic quizzes administered online via Canvas to prepare you for the exams, approximately once per week as listed on the schedule. Quizzes should be taken seriously and are to be completed individually. Quizzes are timed for 1 hour each and must be submitted by the posted deadline to count for credit. The lowest quiz grade will be dropped at the end of the semester.

CANVAS HOMEWORK & WORKSHEETS

Several optional homework assignments are available for each chapter to help you understand the material. The optional homework is posted in Canvas. You have multiple attempts to successfully answer the questions. These are not worth any points. There are also worksheets posted that contain old exam problems.

EXAMS

Progress exams occur in the evenings, periods E2-E3, in exam rooms TBA. Exam dates are provided in the schedule in this syllabus document. The final exam is scheduled during the final exams period as assigned by the registrar. You are permitted use of a non-graphing non-programmable scientific calculator. Notes, cell phones or other electronic devices are not permitted. Scantrons and blank paper are provided.

PROGRESS EXAM "AVERAGE/REPLACE" POLICY

This applies to all students. No progress exam score will be dropped for any reason. To alleviate the stress of potential issues that do not fall under officially sanctioned absences, we have incorporated an "average/replace' policy: the lowest of the three progress exams will be replaced by the average of the three progress exams. This policy helps to minimize the impact of a single poor performance (it will not disappear, but will be minimized). For example, if a student scores the following on their three progress exams: 0%, 65%, 80%, then the 0% would be replaced with the average of 48%. That is a much better score than a 0.

Bubbling errors will not be negotiated. A 5 point penalty will be applied for failure to bubble in a UFID correctly or not taking the exam in the assigned room. A 30 point penalty will be applied for failure to bubble in a form code or the wrong form code or for using a writing implement that cannot be scanned (e.g. a pen).

POSTED GRADE DISPUTES

Should a student wish to dispute any grade received in this class, the dispute must be in writing (via Canvas e-mail to *your* instructor) and submitted within one week of the grade being posted to Canvas. After one week has passed from when the grade was posted and the student made aware of the posting of the grade(s) to Canvas, the instructor considers those grades final.

ATTENDANCE, EXTENSION REQUESTS

Exam absences will be handled in accordance with official UF academic regulations. For more information, see https://catalog.ufl.edu/UGRD/academic-regulations/ . See below for further clarification for two different types of situations.

(1) Conflicts with other events: acceptable reasons may include religious holidays, military obligations, special curricular requirements (e.g., attending professional conferences), or participation in official UF-sanctioned activities such as athletic competitions, etc. For more information on such absences see the official UF Policy at https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/#absencestext). If you must be absent for an exam due to a documented and approved conflict known in advance, you must e-mail your instructor (within Canvas) the documentation at least one week prior to the scheduled exam and an early conflict exam will be scheduled for you.

(2) Missing an exam due to an emergency or sudden illness: If you are absent for an exam due to an unpredicted documented medical reason or family emergency, you must contact the instructor as soon as possible, and you may be asked to have your excuse verified by the Dean of Students Office (DSO). Your instructor will follow UF academic regulations in evaluating the notification and/or documentation received from you or from the DSO on your behalf. Once your instructor is satisfied with the validity of your exam absence a make-up exam will be scheduled after a reasonable amount of time, i.e., before the end of the semester. If your documentation is deemed insufficient to excuse your absence you will receive a zero on the missed exam.

Exams taken at any other time than the regularly scheduled exam time have different questions that assess the same material at a comparable level of difficulty. Students are not able to review these exams until after the semester has concluded.

WORKLOAD

As a Carnegie I, research-intensive university, UF is required by federal law to assign at least 2 hours of work per week outside of class for every contact hour. This is at least 6 hours a week for our 3 credit course. Work done in these hours may include reading/viewing assigned material and doing explicitly assigned individual or group work, seeking help from the instructor in office hours, as well as reviewing notes from class, synthesizing information in advance of exams or papers, and other self-determined study tasks.

Assigned individual work includes: online homework (3 hours a week), pre-class preparation (1 hour a week), mini-projects (1 hour a week), and reviewing. In addition to the graded assignments, it is recommended that you utilize the optional homework, worksheets, and practice exams on Canvas to gain more practice. Some students will require more than 6 hours a week of work outside of class in order to master the material.

GRADING

GRADE POLICY

There is no extra credit available for this course. Exam grades or course grades are not curved. Current UF grading policies for assigning grade points can be found in the catalog. Assignments weights are as follows:

Assignment Group	Weight %
Progress Exams	60%
Final Cumulative Exam	20%
Homework Assignments	5%
Pre-Lecture Assignments	3%
iClicker	3%
Engineering Mini-Projects	7%
Engineering Assignment	2%
TOTAL	100%

Grade scale (note: there is no rounding to your score in Canvas):

Letter	A	A-	B+	B	B-	C+	C	D+	D	D-	E
Cutoff	90.0	86.0	83.0	80.0	77.0	73.0	69.0	66.0	63.0	60.0	< 60.0

UNIVERSITY POLICIES

ACADEMIC POLICIES & RESOURCES

Please see the current academic policies and resources at:
https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

GETTING HELP

For issues with or technical difficulties with Canvas, contact the UF Help Desk: (352)-392-HELP.

DETAILED COURSE SCHEDULE

The following table shows the daily course schedule. Sections and page numbers correspond to the textbook Chemistry: A Molecular Approach, 6e by Nivaldo Tro.

Dates	**Agenda/Topics**	**Tro 6e Section/Pg #**	**Assignments Due**
Mon, Jan 12	Class 1: Intro and Kinetics review	Ch. 15, 642 - 676	PLA 1 (ungraded)
Wed, Jan 14	Class 2: Chemical Equilibrium	Ch. 16.2-3, 698-707	PLA 2
Fri, Jan 16	Class 3: Equilibrium Constants	Ch. 16.4-6, 708-713	PLA 3, HW 1
Mon, Jan 19	MLK Holiday – No Class		
Wed, Jan 21	Class 4: Solving Equilibrium Problems	Ch. 16.7-8, 714-725	PLA 4, HW 2
Thurs, Jan 22	Mini-project 1 inquiry phase		
Fri, Jan 23	Class 5: Le Chatelier's Principle	Ch. 16.9, 726-732	PLA 5, HW 3
Mon, Jan 26	Class 6: Acids, Bases, and pH scale	Ch. 17.2-5, 749-761	PLA 6, HW 4
Wed, Jan 28	Class 7: Relative Strength of Acids	Ch. 17.10, 786-787	PLA 7, HW 5
Thurs, Jan 29	Mini-project 1 problem-solving		Quiz 1
Fri, Jan 30	Class 8: Weak Acids and Bases	Ch. 17.6-7, 762-774	PLA 8, HW 6
Mon, Feb 2	Class 9: Ions and Salts	Ch. 17.8, 775-781	PLA 9, HW 7
Wed, Feb 4	Class 10: Lewis Acids & Bases	Ch. 17.11, 787-789	PLA 10, HW 8
Thurs, Feb 5	Mini-project 1 reporting		
Fri, Feb 6	Class 11: Buffers, Indicators	Ch. 18.2, 810-815	PLA 11, HW 9
Mon, Feb 9	**Exam 1 (8:20pm-10:20pm)**		HW 10
Wed, Feb 11	Class 12: Buffer Effectiveness	Ch. 18.3, 816-818	PLA 12, HW 10
Thurs, Feb 12	Mini-project 2 inquiry		
Fri, Feb 13	Class 13: Acid-Base Titrations	Ch. 18.4, 819-834	PLA 13, HW 11
Mon, Feb 16	Class 14: Solubility Equilibria	Ch. 18.5, 835-838	PLA 14, HW 12
Wed, Feb 18	Class 15: Precipitation of Ionic Salts	Ch. 18.6, 839-841	PLA 15, HW 13
Thurs, Feb 19	Mini-project 2 problem solving		

Fri, Feb 20	Class 16: Complex Ion Equilibria	Ch. 18.8, 845-849	PLA 16, HW 14
Mon, Feb 23	Class 17: Entropy	Ch. 19.3-4, 871-879	PLA 17, HW 15
Wed, Feb 25	Class 18: Spontaneity	Ch. 19.5-6, 880-886	PLA 18, HW 16
Thurs, Feb 26	Mini-project 2 reporting		Quiz 2
Fri, Feb 27	Class 19: Gibbs Free Energy	Ch. 19.7-8, 887-895	PLA 19, HW 17
Mon, Mar 2	Class 20: Free Energy & Equilibrium	Ch. 19.9-10, 896-901	PLA 20, HW 18
Wed, Mar 4	Class 21: Redox Reactions	Ch. 20.2, 917-919	PLA 21, HW 19
Thurs, Mar 5	Mini-project 3 inquiry		
Fri, Mar 6	Class 22: Galvanic Cells & Batteries	Ch. 20.3, 920-924	PLA 22, HW 20
Mon, Mar 9	**Exam 2 (8:20pm-10:20pm)**		
Wed, Mar 11	Class 23: Electrode & Cell Potentials	Ch. 20.4-5, 925-936	PLA 23, HW 21
Thurs, Mar 12	Mini-project 3 problem-solving		
Fri, Mar 13	Class 24: Strength & Corrosion	Ch. 20.9, 952-954	PLA 24, HW 22
Marh 16 – 20	Spring Break – No Classes		
Mon, Mar 23	Class 25: Potential & Concentration	Ch. 20.6, 937-940	PLA 25, HW 23
Wed, Mar 25	Class 26: Current & Electrolysis	Ch. 20.7, 940-944	PLA 26, HW 24
Thurs, Mar 26	Mini-project 3 reporting		
Fri, Mar 27	Class 27: Electrolytic Cells	Ch. 20.8, 944-951	PLA 27, HW 25
Mon, Mar 30	Class 28: Metallurgical Processes	Ch. 25.2-3, 1133-1138	PLA 28, HW 26
Wed, Apr 1	Class 29: Periodicity & Properties	Ch. 26.2, 1159-1164	PLA 29, HW 27
Thurs, Apr 2	Prep for Presentations		
Fri, Apr 3	Class 30: Coordination Compounds	Ch. 26.3-4, 1165-1175	PLA 30, HW 28
Mon, Apr 6	Class 31: Bonding in Compounds	Ch. 26.5, 1176-1178	PLA 31, HW 29
Wed, Apr 8	**Exam 3 (8:20pm-10:20pm)**		
Thurs, Apr 9	Flex Day		
Fri, Apr 10	Class 32: Applications of Compounds	Ch. 26.6, 1178-1180	PLA 32, HW 30
Mon, Apr 13	Class 33: Types of Radioactivity	Ch. 21.3, 970-974	PLA 33, HW 31
Wed, Apr 15	Class 34: Stability, Predicting Decay	Ch. 21.4, 975-977	PLA 34, HW 32

Thurs, Apr 16	Presentations		
Fri, Apr 17	Class 35: Rate and Radioactivity	Ch. 21.5-6, 978-987	PLA 35, HW 33
Mon, Apr 20	Class 36: Fission and Fusion	Ch. 21.7-9, 988-992	PLA 36, HW 34
Wed, Apr 22	Class 37: Organic Structures	Ch. 22.2-3, 1011-1017	PLA 37, HW 35, HW 36
Mon, Apr 27	**Final Exam (12:30pm-2:30pm)**	Cumulative	

SAMPLE GRADING RUBRICS

The following are examples of the rubrics used for the three phases of the engineering mini-projects.

Mini-project inquiry phase	Points
The flow diagram is consistent with the summary of the process	2
All physical and moving components are correctly identified and connected in the flow diagram	2
The flow diagram is professional and is appropriately scaled for the scope of the problem	2
Relevant formulas and equations are identified	2
Relevant information is found and sources are included	2

Mini-project problem solving phase	Points
The motivation for the calculations is identified	2
The calculations include all necessary steps and are presented in an organized manner	2
The calculations are solved correctly based on the given data	2
Key findings are identified for all parts	2
Assumptions are concisely described and justified	2

Mini-project reporting phase	Points
The specific purpose of the project is identified	2
The steps taken to address the project and the key findings are clearly stated	2
The impacts and implications are addressed sufficiently in any applicable contexts	2
The comparisons fit the key findings and impacts of the results; The recommendations provide clear guidance for action and are justified.	2
The report is well-written, organized, and is free of writing errors	2

DISCLAIMER

This syllabus represents my current plans and objectives. Unforeseen circumstances including university closure may necessitate a schedule adjustment. Such changes will be communicated promptly to students.