**CHEM 1211 – Principles of Chemistry I**

# Instructor Information

Dr. Christopher Wozny Peeples Hall, Rm 228

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# Required Text and Materials

MacMillan’s Achieve electronic courseware must be purchased either through the website, located at achieve.[macmillanlearning.com](http://www.saplinglearning.com/), or through the DSC Bookstore as an access card. Safety glass or goggles are also required for the class and are available through the DSC Bookstore. The text for this course is OpenStax Chemistry: <https://openstax.org/details/books/chemistry-2e> ISBN: 1-947172-61-1

# Catalog Information

Explores the discipline of chemistry through an understanding of the basic laws and properties of matter, stoichiometry, atomic structure, chemical bonding, gas laws, solutions, and the physical states of matter. Requires laboratory experimentation which illustrates applications of concepts studied in lecture.

**Prerequisite:** MATH 1111 or higher

# Learning Outcomes

Upon completion of this course, the student should be able to do the following:

1. Understand the fundamental structures of atoms and molecules.
2. Understand the mole concept, stoichiometry, and laws of composition.
3. Determine valences, structure and characteristics, chemical compounds, solutions, and gases
4. Understand basic principles of chemical bonding and molecular orbital theory
5. Gain knowledge and understanding in laboratory methodology including data observation, recording, analysis and reporting.

# Laboratory Safety

The laboratory is an integral part of any science course. When performing chemistry experiments, students **MUST** observe **ALL** safety rules at all times. No one will perform an experiment without goggles when chemicals are involved. There is **NO** eating or drinking in a chemistry laboratory *at any time*. Sandals, open-toed shoes, and shorts are **NOT** permitted in the chemistry laboratory. The instructor will emphasize any special safety precautions in the pre-lab introduction. Failure to follow safety guidelines may result in a lower grade for the experiment, or in cases where infractions have the potential to result in bodily injury to oneself or others, immediate withdrawal of the offender from the course.

# Assessment and Evaluation

Students receive points for quizzes; unit exams and the final exam; class activities and lab reports; and homework assignments. Each of the four types of assessment will count equally toward the final point total and the overall weighted course percentage. Please note that it is *much more important* to successful complete quizzes, laboratory exercises and assignments (~70% of the total grade) than to focus on unit exam scores and the final (30% of the total).

Final grades will be based on a scale that is no more stringent than the traditional formula: A 90 ‑ 100%; B 80 ‑ 89 %; C 70 ‑ 79%; D 60 ‑ 69 %; F below 60% The grading scale or the weighted percentages may be adjusted to the benefit of the student so that a higher final grade may be assigned for a lower overall percentage.

# Course Calendar And Weekly Activities

The Content section of the Desire to Learn (D2L) course website provides detailed information concerning weekly topics, specific learning outcomes for each topic, and instructions for classroom activities. The Achieve courseware includes explicit due dates and policies for homework assignments. The final exam schedule for the term in published on the Dalton State College website at [Dalton State College Current Final Exam Schedule](https://www.daltonstate.edu/academics/final-exams.cms).

A general course outline is as follows, based on the week of instruction. Instructions for the laboratory experiments and accompanying Report Sheets may be found at www.chemistry.exploring-physical-science.site.

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| --- | --- | --- |
| WEEK | TOPIC | Experiment |
| Week 1 | Chemistry Foundations | Introduction to Laboratory Safety |
| Week 2 | Chemical Properties | Mass, Volume and Density |
| Week 3 | Composition | The Mole |
| Week 4 | Composition | The Atomic Mass of Zinc |
| Week 5 | Stoichiometry | The Empirical Formula of Zinc Chloride |
| Week 6 | Stoichiometry | An Iron-Copper Reaction |
| Week 7 | Thermochemistry | Copper Reactions and Percent Recovery |
| Week 8 | Electronic Structure | Calorimetry |
| Wek 9 | Electronic Structure | Hess’ Law |
| Week 10 | Chemical Bonding | Atomic Spectra and the Rydberg Constant |
| Week 11 | Periodic Properties | Chromatography |
| Week 12 | Lewis Structures | Standardization of NaOH |
| Week 13 | Molecular Geometry |  |
| Week 14 | Covalent Bonding |  |
| Week 15 | Covalent Bonding |  |

# Emergency Instructional Plan

If the college is closed for inclement weather or other conditions, the class may meet via Collaborate Ultra, assuming power is still available. The instructor will also communicate further instructions through DSC email or announcements in GaVIEW. If it becomes impossible to send or receive email, or to access on-line resources due to a loss of power, then review the last information we have covered together in class with the expectation on an in-class quiz on that material when classes resume. Compensatory make-up days may be required if the total number of days lost exceeds the equivalent of one week of class time.

# Attendance and Make-up Policies

Attendance is extremely important for the successful completion of this course. In cases of *demonstrated hardship* (as defined by Dalton State College documents), the student will be given the opportunity to make up the missed work, or an equivalent assignment. The opportunity for a student to make up work for *regular* absences is solely at the discretion of the instructor. No guarantee is given that and missed in-class work may be made up, but if so, it must be completed the first afternoon of the return date (typically the next class day).

# COURSE POLICIES AND PROCEDURES

Uniform course policies adopted by the University System of Georgia or Dalton State College that apply to all classes taught by Dalton State College may be found at this link: [https://roadrunner.daltonstate.edu/skins/userfiles/files/REQUIRED%20SYLLABUS%20STATEMENTS.pdf](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Froadrunner.daltonstate.edu%2Fskins%2Fuserfiles%2Ffiles%2FREQUIRED%2520SYLLABUS%2520STATEMENTS.pdf&data=04%7C01%7Ccwozny%40daltonstate.edu%7C201101d7369148bc3cdf08d952a40b42%7Cb7e81e5d72424dff8f1e47d691148e41%7C0%7C0%7C637631686789461618%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=n2x2hjbIUSEOG7l2PDzabJdsxFlYC2lvpiubCxqoffk%3D&reserved=0)

Policies include a diversity statement; disability access; ethical conduct; course withdrawal; full withdrawal, grade appeals; academic progression; the CARE team; basic needs statement; Title IX information; House Bill 280; and approved DSC groups and activities.

**CHEM 1212 – Principles of Chemistry II**

# Instructor Information

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Phone 706 272-2170

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# Required Text and Materials

MacMillan’s Achieve electronic courseware must be purchased either through the website, located at achieve.[macmillanlearning.com](http://www.saplinglearning.com/), or through the DSC Bookstore as an access card. Safety glass or goggles are also required for the class and are available through the DSC Bookstore. The text for this course is OpenStax Chemistry: <https://openstax.org/details/books/chemistry-2e> ISBN: 1-947172-61-1

# Catalog Information

Continues the exploration of the discipline of chemistry begun in CHEM 1211. Focuses on the more quantitative aspects of chemistry including chemical equilibria, kinetics, acid-base, solubility product, electrochemistry and coordination compounds. Requires laboratory development of techniques necessary to identify common metallic and non-metallic ions.

**Prerequisite:** CHEM 1211

# Learning Outcomes

Students completing CHEM 1212 should be able to:

1. Apply mathematical skills to equilibria.
2. Explain the origin of intermolecular forces and effect of these forces in the bulk properties of solutions.
3. Examine the laws of thermodynamics to predict the spontaneity of chemical processes, including electrochemical processes.
4. Comprehend the concept of chemical kinetics and the energy required to initiate a chemical reaction.
5. Relate and calculate the concepts of acids, bases and their reactions.

These objectives cover the course in broad terms. A detailed set of outcomes for the full General Chemistry sequence is available online at: <https://www.usg.edu/assets/strategic_academic_initiatives/committee_docs/documents/chemistry-clo-2003_06.pdf>.

# Laboratory Safety

The laboratory is an integral part of any science course. When performing chemistry experiments, students **MUST** observe **ALL** safety rules at all times. No one will perform an experiment without goggles when chemicals are involved. There is **NO** eating or drinking in a chemistry laboratory *at any time*. Sandals, open-toed shoes, and shorts are **NOT** permitted in the chemistry laboratory. The instructor will emphasize any special safety precautions in the pre-lab introduction. Failure to follow safety guidelines may result in a lower grade for the experiment, or in cases where infractions have the potential to result in bodily injury to oneself or others, immediate withdrawal of the offender from the course.

# Assessment and Evaluation

Students receive points for quizzes; unit exams and the final exam; class activities and lab reports; and homework assignments. Each of the four types of assessment will count equally toward the final point total and the overall weighted course percentage. Please note that it is *much more important* to successful complete quizzes, laboratory exercises and assignments (~70% of the total grade) than to focus on unit exam scores and the final (30% of the total).

Final grades will be based on a scale that is no more stringent than the traditional formula: A 90 ‑ 100%; B 80 ‑ 89 %; C 70 ‑ 79%; D 60 ‑ 69 %; F below 60% The grading scale or the weighted percentages may be adjusted to the benefit of the student so that a higher final grade may be assigned for a lower overall percentage.

# Course Calendar And Weekly Activities

The Content section of the Desire to Learn (D2L) course website provides detailed information concerning weekly topics, specific learning outcomes for each topic, and instructions for classroom activities. The Achieve courseware includes explicit due dates and policies for homework assignments. The final exam schedule for the term in published on the Dalton State College website at [Dalton State College Current Final Exam Schedule](https://www.daltonstate.edu/academics/final-exams.cms).

A general course outline is as follows, based on the week of instruction. Instructions for the laboratory experiments and accompanying Report Sheets may be found at www.chemistry.exploring-physical-science.site.

|  |  |  |
| --- | --- | --- |
| WEEK | TOPIC | Experiment |
| Week 1 | The Gas Laws | Introduction to Laboratory Safety |
| Week 2 | The Ideal Gas | The Empirical Gas Laws |
| Week 3 | Liquids and Solids | Designing a Model Air Bag |
| Week 4 | Solutions | The Enthalpy of Vaporization |
| Week 5 | Colligative Properties | Molar Mass by Freezing Point Depression |
| Week 6 | Chemical Kinetics: Rate Laws | Determining a Rate Law |
| Week 7 | Chemical Kinetics: Reaction Mechanisms | The Effect of Temperature on Reactions |
| Week 8 | Equilibrium Concepts | Spectrophotometry |
| Wek 9 | Equilibrium Applications | An Equilibrium Constant |
| Week 10 | Le Chatelier’s Principle | Le Chatelier’s Principle |
| Week 11 | Acid-Base Properties | The Titration of Citric Acid |
| Week 12 | Other Equilibria | The Solubility Product of Sodium Chloride |
| Week 13 | Redox Reactions |  |
| Week 14 | Electrochemistry |  |
| Week 15 | Thermodynamics |  |

# Emergency Instructional Plan

If the college is closed for inclement weather or other conditions, use the equivalent class time to complete out-of-class activities; specifically, uncompleted on-line home assignments. The instructor will also communicate further instructions through DSC email. If it becomes impossible to send or receive email, or to access on-line resources due to a loss of power, then review the last information we have covered together in class with the expectation on an in-class quiz on that material when classes resume. As always, I will be available to answer questions via email (assuming, of course, there is power). Compensatory make-up days may be required if the total number of days lost exceeds the equivalent of one week of class time.

# Attendance and Make-up Policies

Attendance is extremely important for the successful completion of this accelerated Summer course. Any student missing two or more of the 16 class days before the midterm of the class should consider withdrawing from the course.

In cases of *demonstrated hardship* (as defined by Dalton State College documents), the student will be given the opportunity to make up the missed work, or an equivalent assignment. The opportunity for a student to make up work for *regular* absences is solely at the discretion of the instructor. No guarantee is given that and missed in-class work may be made up, but if so, it must be completed the first afternoon of the return date (typically the next class day).

# COURSE POLICIES AND PROCEDURES

Uniform course policies adopted by the University System of Georgia or Dalton State College that apply to all classes taught by Dalton State College may be found at this link: [https://roadrunner.daltonstate.edu/skins/userfiles/files/REQUIRED%20SYLLABUS%20STATEMENTS.pdf](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Froadrunner.daltonstate.edu%2Fskins%2Fuserfiles%2Ffiles%2FREQUIRED%2520SYLLABUS%2520STATEMENTS.pdf&data=04%7C01%7Ccwozny%40daltonstate.edu%7C201101d7369148bc3cdf08d952a40b42%7Cb7e81e5d72424dff8f1e47d691148e41%7C0%7C0%7C637631686789461618%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=n2x2hjbIUSEOG7l2PDzabJdsxFlYC2lvpiubCxqoffk%3D&reserved=0)

Policies include a diversity statement; disability access; ethical conduct; course withdrawal; full withdrawal, grade appeals; academic progression; the CARE team; basic needs statement; Title IX information; House Bill 280; and approved DSC groups and activities.