

**Dover-Eyota High School**

**Chemistry 1201 Syllabus**

**Course: GENERAL CHEMISTRY I (Fall Semester 2022)**

**Riverland Community Colllege Concurrent Enrollment Course: CHEM 1201**

**Instructor:**  Mr. Harris **Room:** 113

**Riverland Faculty Mentor:** Catherine Haslag

**Contact:** (e-mail) : brianharris@deschools.org or (phone) 507-545-2631 ext 239

**Hours:**  7:30 – 3:30 daily, and by appointment in room 113

I am a resource to help you succeed in this course, use me. You can call me, email me, send a message in teams, or just show up for help.

**Course Information:**

CHEM 1201 Lecture and Lab in Room 113

M,T,Th,F 10:01-11:29

W 10:49-12:03

Credits 5 Hours

In order to fulfill the objectives of this 5-credit course, students are expected to spend 9 hours (3 hours/credit) of study time/week completing lecture materials and assignments and 6 hours (3 hours/credit) of study time/week working on lab materials outside of normal class time.

Covid Statement:

Due to the COVID-19 pandemic the delivery method of this course may change to ensure the safety of the students and faculty.  These changes may come through the governor’s executive order or college/high school administration.  These adjustments may include but are not limited to:

* Adjustments to the amount of on-campus course sessions and online learning
* Adjustments to the course assignment due date
* Additional accommodations for students to complete tests, labs and assignments

 If changes are needed, after I consult with college administration/high school administration, I will communicate with you as soon as possible via email, google classroom or in-person during class time regarding any adjustments necessary to the course because of COVID-19.

If you are sick, test positive for COVID-19, or suspect you have been exposed to COVID-19, DO NOT ATTEND CLASS. Contact your instructor immediately to discuss accommodations for your situation.

**Course Text:** *Chemistry: Matter and Change*. 2002, Glencoe, McGraw-Hill. ISBN # 0-02-828378-3

**Materials:** - Pencil, Pen, Eraser

- Paper

- Netbook (Computer) , Scientific or Graphing Calculator

-Periodic Table

- 2 inch 3-ring-binder (To measure your progress, provide an organized place to put your notes for studying, and provide a place for graded work.) or folder

1. **Course Information**

**INSTITUTIONAL LEARNING OUTCOMES**

This course addressed the following Riverland Institutional Learning Outcome(s):

    ILO 1: critical thinking *(Core Theme Goal 2)*

    ILO 2: awareness of the larger global community *(Core Theme Goal 7 or 8)*

 X ILO 3: ethical, engaged citizenship *(Core Theme Goal 9 or Goal 10)*

ILO 4: communication and collaboration *(Discipline Goal 1 and by any learning outcome(s) involving communication or collaboration)*

**COURSE DESCRIPTION**

This is the first course of a two-semester sequence in general inorganic chemistry, Atomic Theory, stoichiometry, chemical reactions, thermochemistry, chemical bonding, molecular structure, and atomic structure, periodicity, and the gas phase.  This course is for students intending to transfer or pursue Bachelor’s preparation and/or careers in chemistry and the other physical sciences, engineering and health sciences (medicine, pharmacy, veterinary medicine, four-year nursing).

**COURSE RATIONALE**

This course is designed to provide a basic understanding and appreciation of chemistry for those intending to major in a science field.

**COURSE PRE-REQUISITES**

Math 1110 or higher or concurrent registration in Math 1110 or higher.

**COURSE RATIONALE**

This course is designed to provide an understanding and appreciation of chemistry for students pursuing a science degree.

**MAJOR CONTENT AREAS**

* The Scientific Method
* Nomenclature
* Atomic Structure
* Stoichiometry
* Reaction Types
* Thermochemistry
* Molecular Structure – Bonding, Geometry and Polarity
* States of Matter – Gas Phase

This course satisfies Minnesota Transfer Credit (MnTC) Goal 3 (Natural Sciences) and Goal 10 (People and the Environment).  Click [HERE](https://www.riverland.edu/index.cfm/_api/render/file/?method=inline&amp;fileID=0C60F567-DA4E-F753-2071D0E6E77D70AF) to obtain a master course outline for this class. **COURSE OBJECTIVES AND OUTCOMES**

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| --- | --- | --- |
| **GOAL TYPE** | **OBJECTIVES**  **Students will be able to** | **OUTCOMES**  **The student will successfully** |
| MnTC Goal 3a | demonstrate understanding of scientific theories. | 1. explain the primary chemical theories and laws, differentiating between a theory and a law. 2. apply knowledge of scientific theories to problem-solving applications. 3. complete a critical analysis of laboratory experimental findings. |
| MnTC Goal 3b | formulate and test hypotheses by performing laboratory, simulation or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students’ laboratory experience in the collections of data, its statistical and graphical analysis, and an appreciation of its sources or error and uncertainty. | 1. use the scientific method to formulate and test hypotheses in lab experimentation. 2. conduct literature research on concepts discussed in the laboratory. 3. complete an analysis of laboratory experimental results (data) that will include calculations of accepted value, experimental value and % error design. |
| MnTC Goal 3c | communicate their experimental findings, analyses and interpretations both orally and in writing. | 1. discuss the results of the experiments referenced in MnTC Goal 3b in oral and written formats, including predictions, graphs, and calculations. |
| MnTC Goal 10b | discern patterns and interrelationships of bio-physical and sociocultural systems. | 1. explain how pollutants impact water quality. 2. research a current topic on the environment and its impact on the environment and human health. 3. explain how contaminated drinking water can impact human health. |
| MnTC Goal 10d | evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions. | 1. explain sources of human impact on the environment related to a current environmental topic. 2. report on a current environmental topic as outlined below.  Assess their potential impact on the environment and how to address the issue researched. |
| MnTC Goal 10e | propose and assess alternative solutions to environmental problems. | 1. explain the potential impact of pollutants on drinking and groundwater. |
| MnTC Goal 10f | articulate and defend the actions they would take on various environmental issues. | 1. explain their stance, using supporting information, on the current environmental topic discussed in MnTC Goal 10d. |
| CS | gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected. | 1. research, compile, and complete an analysis of scientific findings on the chemistry of the current environmental topic discussed in MnTC Goal 10d. 2. develop opinion on scientific topics supported by empirical facts. |
| CS | utilize scientific literature to explore topics in chemistry. | 1. determine if a source is reliable. 2. explain the peer-review process. 3. evaluate a source for bias. 4. distinguish between primary, secondary, and tertiary sources. |
| CS | describe and apply the scientific method used by scientists in solving problems. | 1. apply knowledge of scientific theories to problem-solving applications. 2. develop a hypothesis for a scientific experiment. 3. identify the control, independent and dependent variable for an experiment. 4. predict next steps for a scientific study using data that has been collected. 5. draw conclusions based on experimental data. |
| CS | apply dimensional analysis with proper attention to units and significant figures. | 1. express numbers in scientific and normal notation. 2. express values using the correct number of significant figures. 3. express measurements in and convert between metric units. |
| CS | determine the number of significant digits in a number and round numbers and calculated results to an appropriate number of significant figures. | 1. identify the number of significant figures in a value. 2. complete calculations using the correct number of significant figures. 3. determine the accuracy and precision of a set of data. |
| CS | demonstrate mastery of density. | 1. experimentally determine the density of an object. |
| CS | distinguish between mixtures, compounds and elements. | 1. identify a mixture and explain separation by physical means. 2. articulate the relationship between elements and compounds. |
| CS | demonstrate mastery of scientific laws. | 1. explain the Law of Conservation of Matter. 2. explain the Law of Multiple Proportions. 3. explain the Law of Definite Proportions. |
| CS | determine the makeup and structure of an atom. | 1. describe electrons, protons, neutrons and the general structure of the atom. 2. define isotope and determine the atomic number, mass number, and number of neutrons for a specific isotope. 3. identify the atomic number and atomic mass for any element. 4. calculate the average atomic mass of an element from isotopic abundances and isotopic masses. 5. correlate wavelength, frequency, and energy of light with electron energy levels in the atom via and photoelectric effect and the Bohr model. 6. apply wave-particle duality and the uncertainty principle to describe properties of electrons. 7. apply the results of the Schrodinger quantum mechanical model of the atom to assign quantum numbers to electrons and write electron configurations of multi-electron atoms and ions. 8. identify valence vs core electrons and predict trends in atomic size, ionization energy, electron affinity, and charges on main-group ions. |
| CS | name chemical compounds. | 1. write the name of a polyatomic ion from the formula. 2. write the formula of a polyatomic ion from the name. 3. write chemical formulas for ionic compounds from the name. 4. write names for ionic compounds given the formula. 5. write chemical formulas for covalent compounds from the name. 6. write names for covalent compounds given the formula. |
| CS | demonstrate stoichiometric relationships. | 1. calculate molar mass from a chemical formula. 2. calculate number of particles in an amount of substance using Avogadro’s number. 3. balance chemical equations. 4. calculate produce and reactant amounts using stoichiometry relationships. 5. determine the limiting reagent in a reaction. 6. calculate percent yield. 7. determine the empirical formula of an unknown compounds using composition by mass or combustion analysis data. 8. calculate the mass, volume or molarity using molarity. 9. determine how to prepare a solution of a given molarity form the solute and water or by dilution of a more concentrated solution. 10. apply titration principles to determine the concentration of an known aqueous solution. |
| CS | write chemical reactions. | 1. identify insoluble ionic compounds. 2. predict products in chemical reactions. 3. write net ionic equations. 4. identify spectator ions. 5. identify strong and weak acids and bases. 6. identify oxidizing and reducing agents in precipitation reactions. 7. identify acid-base and redox reactions. |
| CS | demonstrate an understanding of thermochemistry. | 1. explain the First Law of Thermodynamics and express relationships among heat, work, energy, and enthalpy. 2. apply thermochemical equations to relate amount to heat energy to the quantity of substance reacted. 3. calculate heat transferred using temperature measurements, heat capacity or specific heats. 4. apply Hess’s Law and enthalpies of formation to determine enthalpies of reaction. 5. calculate reaction enthalpies using calorimetry data. |
| CS | demonstrate an understanding of molecular structure. | 1. describe bonding in pure covalent, polar covalent, and ionic structures. 2. draw Lewis structures for compounds including resonance, formal charge, and exceptions to the octet rule. 3. interpret VSPER Theory, Valance Bond Theory, and Molecular Orbital Theory to predict molecular shape, polarity and bonding. |
| CS | demonstrate an understanding of the gas phase of matter. | 1. explain the major points of the kinetic molecular theory of gases. 2. describe the relationship between pressure, volume, moles, and temperature using gas laws. 3. write the equation for the ideal gas law and use it in calculations. 4. apply Dalton’s Law to determine the mole fraction, partial pressures, and the total pressure of a gas mixture. |
| CS | demonstrate proper laboratory technique. | 1. conduct laboratory work in compliance with guidelines for personal lab safety and responsible management of chemical waste; this includes appropriate use of personal protective equipment and interpretation of Globally Harmonized System for Hazard Communication (GHS) labels. 2. measure quantities such as mass, volume, temperature, and absorbance with proper technique, and record the results of measurements with the appropriate number of significant figures and units. 3. record observations of chemical processes (such as precipitate formation, gas evolution, etc.) and write chemical reactions consistent with their observations. 4. demonstrate proper techniques for laboratory procedures, such as titration, filtration, solution preparation, spectrophotometric measurements, etc. 5. demonstrate proper use of glassware and equipment including beakers, Erlenmeyer flasks, volumetric pipets, burets, volumetric flasks, watch glasses, graduated cylinders, filtration apparatus, single-beam spectrophotometer, pH meter, balances. 6. communicate lab procedures, observations, and results in the form of laboratory notebook, written reports, and verbal presentations effectively. 7. interpret and analyze qualitative observations and quantitative results, incorporating graphs and tables as appropriate. |

Course objectives outline what students will be learning in this course.  They are helpful for effectively utilizing course materials to understand concepts and review for exams.  Course objectives for the lecture component of this course are provided on Brightspace in a stand-alone document for each unit.  These documents link unit objectives to the materials provided in this course. These objectives are also referenced in the announcement for each module and on the semester schedule.  In addition, laboratory objectives appear at the top of each experimental procedure. Don't hesitate to get in touch with your instructor if you have any questions about using these objectives.

**II. Evaluation**

1. Your grade in this class is a composite measurement of two things:

1. Your mastery of the Chemistry content and standards.

2. Your professionalism (turning things in on time, safety including proper laboratory techniques, communication, being on task)

**B.** Grading Scale:

**A**: 100% - 96% **B+**: 89% - 87% **C+**: 79% - 77% **D+**: 69% - 67%

**A-**: 95% - 90% **B**: 86% - 83% **C**: 76% - 73% **D**: 66% - 63%

**B-**: 82% - 80% **C-**: 72% - 70% **D-**: 62% - 60%

**F**: 59% - 0%

**C.** Criteria for Arriving at Your Final Grade:

25% Lab reports

50% Exams and Quizzes including a cumulative final exam

25% Independent & Group Practice

**D.** Professionalism Standards:

1. Be prepared when you come to class with all needed readings and assignments done. You must prepare for each of the exams and labs.

2. You must be on time to class and hand in work on time.

3. You must use your time in class doing Chemistry work and following instructions.

4. You must use caution and safe behavior at all times, especially in the lab.

5. You must be respectful and use detail & evidence in your communications.

6. Learning major course concepts and utilizing instructor office hours and free tutoring as needed to reach this goal. For more information about free tutoring at Riverland, please visit <https://www.riverland.edu/student-services/tutoring-services/>.

7. Maintain the highest levels of academic honesty throughout the entire course.

**E.**  How and When You Will be Advised of Your Grades:

Grades are updated at the end of each week. Larger assignments may take longer to grade. Your parents can access grades through the JMC link on the district’s website. Get help early if needed.

**F.**  Parental Contact:

Your parents may be contacted by phone or email concerning your academic and behavioral progress. You and your parents can access my website from the School’s website ([www.desch.org](http://www.desch.org)). I update my website periodically with new assignments, links, documents, and announcements.

1. **Management**

A. Classroom Expectations

1. Be on time with needed materials.
2. Treat people/property with respect.
3. Use class time effectively.
4. Ask for help when needed. (Take responsibility for your learning.)
5. Give your best effort all of the time. Complete assignments on time. Take pride in your work.

Follow all other rules listed in the student handbook

**6.** BE SAFE: Know and practice safe laboratory behavior. Know how to use and where to locate the safety and emergency equipment in the room. Know the emergency procedures for fire, spill, cut, etc.. Keep the classroom clean. Always wear goggles in the lab.

B**.** Classroom and Community Expectations:

1. We don’t use cell phones in class. If you have an emergency, tell Mr. Harris and he may send you to the office to use their phones or use the classroom phone. You may leave your phone in your backpack or place it in the numbered pockets on the east wall in the room. You are not to have your cell phone visible.
2. We follow all the policies in the ***Student Handbook*** – which includes the drugs, alcohol, tobacco, fighting, cheating, plagiarizing, weapons, attendance, clothing, harassment & \*bullying\*, and language guidelines.
3. We return all borrowed materials.
4. We follow the school behavior guidelines: Be cooperative, Strive for Excellence, Show pride, Be a caring person, Be honest, Be reliable, Show respect.
5. **Internet** **& Computer Use** – Any student not properly using the internet or their computer will first receive a verbal warning. If it continues, the student will lose those privileges for that day, and may not be eligible to use the netbook for the rest of the week. Any further misuse will follow the District’s discipline policy #524.

**Consequences**

Students are expected to be on time for class. If a student is late he/she will be hopefully fix the problem themselves. If tardiness becomes a problem, he/she will serve some time in detention. Insubordination will not be tolerated and students will be sent to the office. Phones are to be stored in backpacks during class. Computer use is a privilege. Students who use the computer in a non school related manner according to the handbook will be asked to close or put away their computer for the rest of the block. A second offense will result in the student being referred to the office according to the student handbook. Please see the student handbook for other consequences especially for cheating. I have a zero-tolerance policy on cheating in this course. If you cheat in this class, you will be reported to the college and you will receive a zero in this course. I have a zero-tolerance policy on cheating in this course. If you cheat in this class, you will be reported to the college and you will receive a zero in this course.

**Mission Statement**

The mission of this classroom is for students to strive for high student achievement in the area of science while learning the basic science process skills that will allow them future success in science and life after school. By understanding more about how science works, students will be better prepared for the technology of the future. Science teaches the students the ability to think critically, a skill that can be useful in other disciplines and in everyday life. Chemistry is everywhere in the world and important to everyone. The study of chemistry will allow you to gain knowledge in the way chemicals play a vital role in our lives.

**COMMUNICATION**

The official communication method for Riverland Community College is Riverland’s assigned email (@my.riverland.edu). Please check your Riverland student email frequently for class as well as college wide notices.

**PERSONAL EMERGENCIES**

If at any point during the semester you experience a major life emergency (such as the death/major illness of a close family member or major illness on your part) that impacts your ability to complete this course as outlined in the syllabus and semester schedule, please talk to your instructor IMMEDIATELY.  I am willing to work with students in these situations so they can still complete the course; however, I can do nothing if you don’t talk to me right away.  If you wait until the very end of the semester to talk to me about a hardship you experienced months ago, I may not be able to help you.

**ACCOMMODATION FOR DISABILITY**

Riverland Community College complies with the provisions of the American with Disabilities Act, which prohibits discrimination in education based on an individual’s disability.  The Student Success Center provides reasonable and appropriate testing accommodations upon request for students who have documented physical or psychological disabilities.  Requests for accommodations must be made at least one week in advance.  Documentation of a disability must be on file in the Student Success Center prior to testing.  For information and application for testing, accommodations go to <https://www.riverland.edu/student-services/accessibility-services/>.

A copy of Riverland’s policy for American’s with Disabilities Act can be found at <https://www.riverland.edu/policy/1000-Administration/Americans-with-Disabilities-Act.pdf>.

**STUDENT CODE OF CONDUCT AND ACCADEMIC DISHONESTY POLICY**

Conduct by a single student or a group of students that unreasonably restricts others’ freedoms and interferes with the college mission of promoting student learning is subject to regulation and/or sanction by the college. Plagiarism and other academic or student misconduct will result in disciplinary action including, but not limited to, receiving a score of ‘0’ on the plagiarized assignment or failure of the course. For more information on Student Code of Conduct Policy, go to <https://www.riverland.edu/about-riverland/policies-and-procedures/student-code-of-conduct-policy-procedure/>

The Riverland Student Handbook can be accessed at <https://www.riverland.edu/student-services/student-handbook/>.

You are expected to properly cite your sources in this course in either APA or MLA format. Information on how to cite sources in these formats and additional information regarding plagiarism can be found at <https://subjectguides.library.american.edu/citation#acs>.

I have a zero-tolerance policy on cheating in this course. If you cheat in this class, you will be reported to the college and you will receive a zero in this course.

**AFFIRMATIVE ACTION STATEMENT**

Riverland Community College is an affirmative action, equal opportunity employer and educator accredited by the Higher Learning Commission. Individual college programs are accredited by other associated professional organizations. For more information, go to <http://www.riverland.edu/about-riverland/policies-and-procedures/> to review the Equal Opportunity and Nondiscrimination in Employment and Education Policy or to complete the online Complaint Form.

**EQUITY STATEMENT**

Respect for All: The instructors and students in this class will act with integrity and strive to engage in equitable verbal and nonverbal behavior with respect to differences arising from age, race, ethnicity, color, national origin, gender, sex, pregnancy, disability, sexual orientation, genetic information, veteran’s status, marital status, religion, or political affiliation.

**ADA STATEMENT & ACCOMMODATIONS INFORMATION**

Riverland Community College is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to work directly with staff in Accessibility Services (AS) to establish eligibility and learn about related processes before accommodations will be identified. After eligibility is established, AS staff will create and issue a Notification Letter for each course listing approved reasonable accommodations. This document will be made available to the student and instructor either electronically or in hard-copy every semester. Students and instructors are encouraged to review contents of the Notification Letters as early in the semester as possible to identify a specific, timely plan to deliver/receive the indicated accommodations. Reasonable accommodations are not retroactive in nature and are not intended to be an unfair advantage. Additional information or assistance is available online at: <https://www.riverland.edu/student-services/accessibility-services/>

This information will be made available in alternative formats such as braille, large print, or audio upon advanced request by informing <https://www.riverland.edu/student-services/accessibility-services/>

**VETERANS SUPPORT STATEMENT**

Riverland is dedicated to assisting veterans and eligible family members in achieving their educational goals efficiently. Active duty and reserve/guard military members should advise their instructor of all regularly scheduled military appointments and duties that conflict with schedule course requirements. Instructors will make every effort to work with the student to identify adjusted timelines. If you are a veteran, please contact the Veterans Services Office at <https://www.riverland.edu/admissions/studenttype/veterans-military-members/>

**STUDENT SERVICES**

Riverland provides a plethora of academic and support services to help students succeed. Please see information of available resources at [www.riverland.edu/student-services/](http://www.riverland.edu/student-services/) If at any time during the semester you are having difficulties or are thinking about withdrawing from the class, please let your faculty, advisor or student services staff know immediately so we can help.

**DROPPING A CLASS**

If at any time during the semester you are having academic difficulties or thinking about withdrawing from the course, please see your instructor immediately.  If you are having personal difficulties or problems preventing you from being successful, contact the Riverland counselors by email at [counselors@riverland.edu](mailto:counselors@riverland.edu) or call 507-433-0600 to schedule a counseling appointment.

If you are considering dropping this course, please come talk to your instructor first to evaluate your current grade and determine if dropping the class is your best option.  It is your responsibility to understand the college’s procedure for dropping or withdrawing from a class.  If you stop attending this class but do not follow proper procedures for dropping or withdrawing, you will receive a failing grade.  Failure to properly drop or withdraw from classes can have a detrimental effect on your grade point average and your future educational goals.

All policies of Minnesota State and Riverland Community College apply to this course.  The instructor retains the right to change course requirements and the semester schedule at their discretion.  Any exceptions to the above policies must be obtained from the instructor in advance and in writing.  Failure to comply with the policies outlined in the course syllabus may result in course failure or a lowering of your grade, at the discretion of the instructor.

**FACULTY ABSENCE**

Students are reminded that faculty absences will be posted on the Riverland website at <https://www.riverland.edu//index.cfm/current-students/> and if an instructor is able, on each course’s Brightspace site along with any information concerning alternate assignments for the time the instructor is absent.

**COLLEGE CLOSURE**

For information related to possible college campus closure due to weather or other issues, please go to the Riverland Community College website at <http://www.riverland.edu/current-students/> for further information and/or instructions. Students are encouraged to register for free cell phone or email StarAlert emergency notification system.

**SUBJECT TO CHANGE STATEMENT**

Course materials, testing requirements and grading subject to change at the discretion of the instructor*.*