



General Chemistry II

CHEM 1412.201

Course Syllabus: Summer 2019

"Northeast Texas Community College exists to provide responsible, exemplary learning opportunities."

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	Monday	Tuesday	Wednesday	Thursday	Friday	Online
Office Hours	Available before lecture and after lab by appointment.				none	via NTCC email

The information contained in this syllabus is subject to change without notice.

Students are expected to be aware of any additional course policies presented by the instructor during the course.

Course Description:

Continuation of CHEM 1411. Topics include: chemical equilibrium, solutions, phase diagrams, acid-base concepts, thermodynamics, kinetics, electrochemistry, nuclear chemistry, and descriptive inorganic chemistry. May also include an introduction to organic chemistry.

Successful completion (final grade of C or better) of CHEM 1412 will allow the student to continue on to CHEM 2423.

Prerequisite: CHEM 1411

This course consists of both lecture (3 hours) and laboratory (4 hours) each week.

Required Textbooks & Materials:

Chemistry: Structure and Properties – Exclusive Access

Tro; 2nd Edition – (ISBN # 9780134528229) – Pearson

The required materials for the lecture portion of this course are available using EXCLUSIVE ACCESS. This means that you paid a discounted price for the eText and Mastering Chemistry when you paid tuition for this course. You automatically have your access code for Mastering Chemistry.

A discounted physical textbook is also available at an additional cost (\$50 + tax) once the semester is underway. If you would like a physical book, you can only purchase one at this discounted price through the NTCC College Store.

You can find additional information about exclusive access on the NTCC College Store's Exclusive Access website (https://www.ntccbookstore.com/Exclusive_Access.asp?).

Lab Manual for CHEM 1412 – Experiments in General Chemistry II (v3.0)

NTCC Printing, only available in NTCC College Store

Lab Safety Glasses/Goggles:

Approved safety glasses are available in the college store, and many safety glasses and safety goggles are also available from online retailers. ***Always check with your instructor before purchasing eye protection from somewhere other than The NTCC College Store.*** Students who wear corrective-vision glasses must have elastic-strap safety goggles that cover the entire glasses and seal against the forehead.

Beginning Wednesday July 17, students arriving to lab without proper safety glasses or goggles will not be allowed to participate in the experiment and will receive a grade of zero for that experiment. Before that date, safety glasses/goggles may be rented from the instructor for the cost of five (5) points deducted from the behavior, safety, and teamwork grade.

Scientific Calculator:

A scientific calculator is required for this course. A model TI-30Xa is suggested, but many models will work; check with your instructor. You will NOT be allowed to use a graphing calculator, programmable calculator, or cell-phone calculator during any exam in this course. It is recommended that students have (or have access to) a graphing calculator (TI-*n*spire or similar) for some experiments and problems; however, students will not be allowed to use this calculator on any exam in this course.

Pencils and Erasers:

Pencil is mandatory for writing in the lab manual, quizzes, and exams. A strong, sturdy eraser is required to ensure that your work is professionally presentable. Any papers submitted in pen will not be graded and will receive a grade of zero. Any papers that are too sloppy, messy, or unreadable will incur severe point deduction or earn a grade of zero.

Core Curriculum Purpose and Objectives:

Through the core curriculum, students will gain a foundation of knowledge of human cultures and the physical and natural world; develop principles of personal and social responsibility for living in a diverse world; and advance intellectual and practical skills that are essential for all learning.

Courses in the foundation area of **life and physical sciences** focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

College Student Learning Outcomes:

Critical Thinking Skills

CT1. Students will demonstrate the ability to 1) analyze complex issues, 2) synthesize information, and 3) evaluate the logic, validity, and relevance of data.

Communication Skills

CS1. Students will effectively develop, interpret and express ideas through written communication.

Empirical and Quantitative Skills

EQS1. Students will manipulate numerical data or observable facts by organizing and converting relevant information into mathematical or empirical form.

EQS2. Students will analyze numerical data or observable facts by processing information with correct calculations, explicit notations, and appropriate technology.

Team Work

TW2. Students will work with others to support and accomplish a shared goal.

Course Student Learning Outcomes: Students will...

1. state the characteristics of liquids and solids, including phase diagrams, and articulate the importance of intermolecular interactions and predict trends in physical properties;
2. identify the characteristics of acids, bases, and salts, and solve problems based on their quantitative relationships;
3. identify and balance oxidation-reduction equations, solve redox titration problems, discuss the construction and operation of electrochemical cells, and determine standard and non-standard cell potentials;
4. determine the rate of a reaction and its dependence on concentration, time, and temperature, and analyze and perform calculations with the thermodynamic functions: enthalpy, entropy, and free energy;
5. apply the principles of equilibrium to aqueous systems using LeChâtelier's Principle to predict the effects of concentration, pressure, and temperature changes on equilibrium mixtures;
6. describe basic principles of descriptive inorganic chemistry and of nuclear decay processes;
7. working in groups, demonstrate competence in the laboratory including the ability to carry out experiments in a safe and efficient manner. Laboratory reports will be used to test the ability of students to work in teams and to interpret and to express chemical concepts in writing.

Lectures & Discussions:

We will cover nearly all of the material in Chapters 11, 13-20, 22 and parts of Chapter 8 in the text.

Week 1	Intermolecular Forces, Liquids, Phase Changes, and Phase Diagrams Solutions, Concentration, and Colligative Properties Kinetics: Reaction Rates
Week 2	Kinetics: Reaction Mechanisms Nuclear Chemistry and Its Applications
Week 3	Equilibrium: Introduction, Equilibrium Constant, and Le Châtelier's Principle Equilibrium: Acids & Bases and pH Equilibrium: Salts, Polyprotic Acids, and Lewis Acids and Bases Equilibrium: Buffers and Acid-Base Titrations Equilibrium: Solubility and Precipitation Equilibria
Week 4	Thermodynamics: 2 nd and 3 rd Laws, Entropy, Free Energy, and Equilibrium Oxidation/Reduction Reactions and Voltaic Cells
Week 5	Electrochemistry: Non-Standard Conditions, Equilibrium, Batteries, Electrolysis Coordination Complexes, Crystal Field Theory, and Color

More detail can be found by examining the Table of Contents in the text and the "Topical Course Outline" posted on Blackboard. You should bring a reliable scientific calculator to class every day. Programmable calculators, graphing calculators, and cell phone calculators are not allowed on exams. Sharing calculators will not be permitted.

Evaluation/Grading Policy:

		<u>Grading Scale</u>
Regular Exams	33%	A = 100 – 90%
Laboratory	30%	B = 89 – 80%
Final Exam	20%	C = 79 – 70%
Mastering Chemistry	5%	D = 69 – 60%
Attendance	2%	F = <59%
<u>Assignments*</u>	<u>10%</u>	
Total	100%	

Final course grades are rounded to the nearest whole number percent, and letter grades assigned using the above scale.

* Assignments include anything assigned by the instructor including, but not limited to quizzes, homework, and problem sets.

Grades will be posted to Blackboard throughout the course. Blackboard provides an approximate course grade, which is typically within 2-4% of the actual course grade. The instructor's gradebook is the last word in grades and is what decides the final grades for the course. At any time during the term, students can request to view their grades in the instructor's gradebook or can request a pdf copy of their grades.

Questions about what score on the Final Exam is required to earn a particular grade in the course will not be answered. Please do not ask.

Exams:

Three regular exams will be given during the lecture periods on the following dates:

- Exam 1 Monday, July 22
- Exam 2 Monday, July 29
- Exam 3 Monday, August 5
- Exam 4 Monday, August 12

Exam dates are subject to change, if circumstances dictate it. Ample notice will be given verbally during class, in such instances. Under some rare circumstances students may take exams in advance; this will be decided on a case-by-case basis in advance of the exam date.

There will be no make-up exams for missed exams without authorization before the exam date.

There will be a comprehensive Final Exam held according to the announced final exam schedule:

Thursday, August 15 1100am – 110pm

Guidelines for exams in this course:

- Students are only allowed to bring pencils, erasers, and scientific calculators into the testing room. Programmable calculators, graphing calculators, and cell-phone calculators are not allowed. Sharing calculators will not be permitted.
- Bags, purses, etc. are not allowed, and can be stowed in the chemistry lab or in the hallway during the exam.
- Cell phones are not permitted. Phones should be turned off and stowed in a bag that is not in the exam room or surrendered to the instructor during the exam. A student in possession of phone once the exam has started will earn a grade of zero on that exam.
- Watches are not permitted in the exam room; watches, and other personal electronic devices, must be stowed in a bag that is not in the exam room.
- Students will be provided with scratch paper and a formula sheet for each exam. Other papers or notes will not be permitted in the exam room.
- Students that leave the testing room during the exam must turn in the exam to be graded and can not return to the exam room until the testing period is over.
- At the instructor's discretion, students may be assigned seats during an exam period.
- A student found in violation of any of these guidelines during an exam period will earn a grade of zero on that exam.

Graded Exams will not be handed back to the student: Students who wish to review their graded exams must come to the instructor's office to view the exam. Exams are not to leave the office. Students must surrender their phones while reviewing exams. No notes or corrections may be made on exams or scratch paper.

Quizzes and Assignments:

Assignments throughout this course include anything assigned by the instructor and collected for a grade, excluding exams and laboratory work. This includes, but is not limited to, problems from the text, Mastering Chemistry online homework, and handouts from class. **Students should expect to be working on assignments outside of class on their own time throughout the entire duration of this course.** For each hour that you spend in class, plan to spend a minimum of three hours out of class studying, reading the book, working on homework problems, etc.

A quiz will be given during all lectures. Students who are absent from class will earn a zero on the quiz, and makeup quizzes will not be given. In-class quizzes are due by the end of the lecture period; in-class quizzes that are not in the instructor's possession when he/she returns to his/her office are late. Take-home quizzes are due at the beginning of the next lecture period; take-home quizzes that are not in the instructor's possession when the lecture begins are late. **Late quizzes are not accepted; you will earn a grade of zero and be marked as absent from class.** In special cases, outside-of-class paper assignments may be accepted late; this requires prior authorization in advance of the due date.

Attendance is mandatory for this course and is worth 2% of your overall course grade. Every in-class quiz includes attendance points for that class period. A grade of zero on an in-class quiz counts as being absent from class that day. In rare cases, you may be excused from a class period; proof of a legitimate reason for being absent is required, and the instructor is the final judge of what constitutes a legitimate reason. Excused absences refund the missing attendance points, but do not award quiz grades.

This course will be using the Mastering Chemistry online homework system. Details about registering in Mastering Chemistry will be discussed on the first day of class. Assignments and due dates will be listed in the Mastering Chemistry system. Access to a computer with the internet is required for this course.

The Mastering Chemistry system will be used both inside the classroom and outside the classroom. You are expected to have a laptop computer, tablet, cell phone, or similar device to access Mastering Chemistry during the class period. This course will be a *partially flipped classroom*, which means you will be required to read material from the text (or etext) and answer some questions/problems before coming to class. During class, it will be expected that you have a baseline knowledge of the topic of the day from completing the reading assignment before class, and more in-class time will be devoted to discussions and problem solving rather than purely lecture. You will be working in groups during lecture.

Laboratory Experiments:

There will be 12 experiments performed during the laboratory periods over the course of the term. Any experiments not completed and turned in will receive a grade of zero. A total of 8 experiments must be completed and receive a non-zero grade in order to pass this course (non-F grade). In addition, a Lab Practical is required as part of the laboratory portion of the course. A schedule of experiments will be provided as a separate handout. It is the responsibility of the student to arrive to lab prepared for the correct scheduled experiment.

Laboratory Conduct and Attire:

Students are expected to adhere to the guidelines set forth in the “Commitment to Laboratory Safety Pledge” and in the safety video. In addition, students must wear long pants covering their ankles (leggings are unacceptable), closed shoes (no exposed skin or sock), and shirts that cover their shoulders. Approved safety glasses/goggles at all times in the lab. Students who wear corrective-vision glasses must have elastic-strap safety goggles that cover the entire glasses and seal against the forehead. Long hair should be pulled back. Failure to follow laboratory safety protocols could result in injury to yourself or others and will result in reduction of your laboratory grade. Students not dressed appropriately for lab will be asked to leave and will earn a grade of zero on that experiment.

Laboratory Evaluation/Grading Policy:

The laboratory portion of the course counts towards 30% of your overall course grade.

Regular Experiments	75%
Lab Practical	15%
<u>Behavior, Safety, & Teamwork</u>	<u>10%</u>
Total	100%

Prelaboratory Assignments accompany each experiment in the lab manual and must be completed prior to the laboratory period. **Prelaboratory Assignments are due at the beginning of the laboratory period.** Students not turning in a complete Prelaboratory Assignment will not be allowed to participate in that experiment and will receive a grade of zero on that experiment. Unless otherwise stated, Regular Experiment reports are due at the end of the laboratory period.

Questions in the lab manual that require written explanations must be answered in complete, thoughtful sentences. Failure to do so will result in loss of points.

Calculations in the lab report must show all of the steps necessary to generate the answers provided, including proper use of units and significant figures. Failure to do so will result in loss of points.

Lab reports that are sloppy and/or illegible will not be graded; although, some points may be earned for completing the experiment. Lab reports must be completed neatly in pencil. Errors must be completely erased. Lab reports written in pen and lab reports with scratched-out or scribbled-out writing will not be accepted and will earn zero points.

Copying answers on any work will not be tolerated. Prelaboratory Assignments and Lab Reports that appear to have answers copied from other students or internet sources or that appear to have cheated in any way will earn a grade of zero.

Students who leave lab early without permission from the instructor and their lab partner(s) will incur a point reduction.
Keep in mind that teamwork is 10% of your lab grade!

Lab Practical Exam:

A Lab Practical is required and is worth 15% of the laboratory grade. This will involve a titration experiment. More details will be given during the laboratory periods and can be found in the lab manual. The Lab Practical is an exam, and all Exam Guidelines must be followed (see above).

Student Responsibilities/Expectations:

Purchase of a simple, scientific calculator is required. **You must bring a calculator with you to every laboratory period.** It is recommended that students have (or have access to) a graphing calculator (TI-*nspire* or similar) for some experiments and problems; however, students will not be allowed to use this calculator on any exam in this course.

You are expected to attend all laboratory periods. Failing to attend lab will earn you zero points for that experiment. “I have to work” is not an acceptable excuse for missing a laboratory period.

You are expected to attend all classes. Chemistry is too hard to learn on your own. Some lecture material not found in the text may be presented during the semester and will show up on exams.

Use of cell phones is prohibited during class and lab time. Students using phones for unapproved purposes during lab will be asked to leave lab and will earn a grade of zero on material for that lab period.

This course covers a lot of material and moves rapidly, so do not fall behind.

The only way to learn chemistry is through practice. You must be willing to spend time working problems from the textbook to be successful. If you are having problems with a particular topic, it may even be necessary to work problems from the textbook that are not assigned.

At the first sign of trouble you should seek help immediately. I am happy to help you with any of your chemistry coursework. However, if you wait too long to seek help, there is a point where there is nothing I can do to help you.

Work with a classmate on the homework, but do not just copy answers that you do not understand. There is a difference between working together and cheating. If it feels like cheating, then it is cheating. Assignments that appear to be copies of each other will earn grades of zero. Students caught in the act of cheating will earn a zero on that assignment, lab, or exam and may earn a grade of "F" in the course for such actions. Students with multiple instances academic dishonesty will earn a grade of "F" in this course.

Do not fall behind in the class. If you do not understand Chapter 1, you will probably not understand Chapter 2 either, because the material for this course is cumulative.

Do not wait until the night before a test to study. Almost everything we cover will come up again later in the class. If you learn the material only long enough to take an exam, you will not recognize it when we encounter it again. This will cause you to struggle through the entire course and to struggle through future chemistry courses.

Questions and/or observations are encouraged during the class period. Courteous and attentive behavior is always expected. Students who consistently misbehave can expect to have their grade lowered.

Wearing headphones during class, lab, or an exam is not allowed. Use of listening devices will earn the student a zero on work for that class session.

Thursday, August 8 is the last day to withdraw from the course with a grade of "W". Students who withdraw from the lecture must also withdraw from the lab. If you stop attending class and fail to officially withdraw, expect to earn a grade of "F" in the course.

Like all colleges, Northeast Texas Community College strives to be a "community of scholars." Please remember that you and all of the students in this class are pursuing very important goals in your lives. As human beings and as scholars, I expect every student to be courteous and considerate toward other students throughout the lecture and laboratory portions of this course.

As your instructor, I will attend all classes on time and prepared to teach what you are expected to learn each day. I will make a conscientious effort each class period to teach to the best of my ability and to provide you with clear, well-organized explanations of class material. I care deeply about your learning experience and your success in this course. However, that ultimate success does depend largely on you. Your success can be maximized and your potential achieved by making a commitment to meet the following classroom expectations:

- a) Attend ALL classes – physically and mentally. Wherever you are, be all there.
- b) Be on time for class. Attitude is not everything but it is very important. Remain in class for the entire instructional period.
- c) Be an active learner – participate in class. Be attentive, answer questions, and ask questions. Smile, be interested, and act as if you care. (OK, I'll admit that occasionally things get a little boring; work through that boredom by participating!)
- d) Read ahead. This will help make the next lecture much more effective.
- e) A good student acts like a good student, which includes not sleeping in class, not talking in class, and not reading unrelated material or doing other work in class. All cellular phones must be turned off during class time.
- f) Realize that I do not GIVE grades. You EARN grades based upon your performance. That performance includes turning all assignments in on time. You shouldn't expect less of me because of my other commitments. I don't expect less of you because of your other commitments.
- g) Be respectful of yourself, your classmates, and your instructors.
- h) Learning is hard work but it is also invigorating and fun. Work hard and have fun doing so.

NTCC Academic Honesty Statement:

"Students are expected to complete course work in an honest manner, using their intellects and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. NTCC upholds the highest standards of academic integrity. This course will follow the NTCC Academic Honesty policy stated in the Student Handbook."

Academic Ethics:

The college expects all students to engage in academic pursuits in a manner that is beyond reproach. Students are expected to maintain complete honesty and integrity in their academic pursuit. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. Refer to the student handbook for more information on this subject.

ADA Statement:

It is the policy of NTCC to provide reasonable accommodations for qualified individuals who are students with disabilities. This College will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to arrange an appointment with a college counselor to obtain a Request for Accommodations form. For more information, please refer to the NTCC Catalog or Student Handbook.

Family Educational Rights and Privacy Act (FERPA):

The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education. FERPA gives parents certain rights with respect to their children's educational records. These rights transfer to the student when he or she attends a school beyond the high school level. Students to whom the rights have transferred are considered "eligible students." In essence, a parent has no legal right to obtain information concerning the child's college records without the written consent of the student. In compliance with FERPA, information classified as "directory information" may be released to the general public without the written consent of the student unless the student makes a request in writing. Directory information is defined as: the student's name, permanent address and/or local address, telephone listing, dates of attendance, most recent previous education institution attended, other information including major, field of study, degrees, awards received, and participation in officially recognized activities/sports.