CHEM 1412 – General Chemistry II – Face-to-Face

Course Syllabus: Spring 2020

"Northeast Texas Community College exists to provide personal, dynamic learning experiences empowering students to succeed."

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Office Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Online
	1000-1220	1000-1220	1000-1220	1000-1220	None	Anytime via NTCC email

This syllabus serves as the documentation for all course policies and requirements, assignments, and instructor/student responsibilities.

Information relative to the delivery of the content contained in this syllabus is subject to change. Should that happen, the student will be notified.

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 Organic Chemistry I – CHEM 2423.

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

Prerequisite(s): CHEM 1411 with final grade of C or better

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: Upon successful completion of this course, 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;
5. analyze and perform calculations with the thermodynamic functions: enthalpy, entropy, and free energy;
6. 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;
7. describe basic principles of descriptive inorganic chemistry and of nuclear decay processes;
8. use basic apparatus, apply experimental methodologies used in the chemistry laboratory, and demonstrate safe and proper handling of laboratory equipment and chemicals;
9. conduct basic laboratory experiments with proper laboratory techniques, and make careful and accurate experimental observations;
10. relate physical observations and measurements to theoretical principles, and interpret laboratory results and experimental data, and reach logical conclusions; and
11. record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.

Evaluation/Grading Policy:

Mastering Chemistry	7.5%
Assignments* & Attendance	7.5%
SI Tutoring	5.0%
Regular Exams	27.0%
Midterm Exams	20.0%
Laboratory	25.0%
ACS Final Exam	8.0%
Total Course Grade	100%

* Assignments are anything assigned by the instructor that does not fit into any of the other categories.

Grading Scale
A = 100 – 90%
B = 89 – 80%
C = 79 – 70%
D = 69 – 60%
F = <59%

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

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 period on the following dates:

Exam 1	Thursday, February 6
Exam 2	Thursday, February 27
Exam 4	Tuesday, April 14

- Two cumulative midterm exams will be given during the lecture period on the following dates:

Midterm Exam 3	Thursday, March 26
Midterm Exam 5	Thursday, May 7

- 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.***

- ***The American Chemical Society (ACS) Standardized Two-Semester General Chemistry Final Exam*** will be administered during the mandated final exam time for this course. The ACS Exam is a nationally administered exam that covers topics covered in the two-semester sequence of general chemistry. Questions on this exam will cover topics from both CHEM 1411 and 1412. This is a 70-question multiple choice exam with strict guidelines that will be discussed in class. This exam is challenging and will give students an idea as to how they perform relative to other students across the nation (community college and university) that take this test.

  Thursday, May 14 130-320pm

- ***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 at the student tables and should be stowed at the front of the room or in the hallway.
  - Cell phones are not permitted. Phones should be turned off and stowed in a bag 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.
  - Students will be provided with scratch paper and a formula sheet for each exam. Other papers or notes will not be permitted during the exam.
  - Students that leave the testing room during the exam must turn in the exam to be graded and cannot 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.

Required Instructional 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 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)
  Murphy; 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 Tuesday, February 11, 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-36x Pro or 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.

Optional Instructional Materials:
- TI-nspire Graphing Calculator

Minimum Technology Requirements: The following items must be brought to every lecture session
- Scientific Calculator - TI-36x Pro and TI-30Xa are recommended – also required for every lab session
- Wireless Internet capable laptop computer or tablet

Required Computer Literacy Skills:
- Web browsing skills for working with the online homework system
- Ability to use Blackboard for access to course information
- Competent and professional emailing skills
- Functional use of MS Word and Excel will be helpful in this course

Course Structure and Overview:
- Lecture Sessions: Tuesdays & Thursdays 130-250pm
  The lecture portion of this course is in the partially-flipped style. Students are required to complete online homework assignments before coming to class to prepare for that day's activity. Lecture will take approximately half of the class time, while the other half of the class time students will be working in small groups. Students will be required to work an online homework assignment and a paper quiz in small groups during each class period. A wireless internet capable laptop or tablet is required in class for completing these assignments. Additionally, students are expected to work on assignments, reading, and studying a minimum of 3 hours outside of class for every one hour of class time. Students are expected to attend SI Tutoring sessions regularly, approximately 3-4 hours per week.

All exams in this course are administered during the lecture sessions. Students will have 80 minutes to complete an exam. Exams consist of multiple-choice questions, short answer or essay questions, and calculation problems. For more information about exams, see the above section on exams.

- Laboratory Sessions: Tuesdays or Thursdays 300-650pm

  Detailed instructions, guidelines and descriptions of what is expected for laboratory sessions can be found on the following pages under the heading "Institutional/Course Policy".

Communications:

- The major communication pathway between instructors and students in this course is face-to-face during lecture and laboratory sessions, during SI Tutoring hours, and during office hours. Students are expected to ask questions and participate in discussions during lecture, lab, and tutoring.
- NTCC email is the official form of communication used by the college. Email communications from non-NTCC email addresses run the risk of being marked as spam and may not be answered.
- Course announcements that occur outside of lecture and lab sessions will be announced via Blackboard's announcement feature. These will be cc'd to students via NTCC email.
- Students are expected to check Blackboard and their NTCC email accounts regularly.
- All grading policies and due dates for online homework assignments are listed in the online homework system.

Institutional/Course Policy:

- ***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.

- Quizzes

  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

  Attendance is mandatory for this course. 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.

  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.

- Online Homework

  This course uses 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 wireless internet capable laptop computer or tablet to access Mastering Chemistry during the class period.

- Supplemental Instruction

  Supplemental Instruction (SI; aka tutoring) is required for this course. Many hours of FREE SI tutoring are available each week. SI Tutors are chemistry majors that have earned high grades in this course. Students are expected to attend approximately 3 hours of SI tutoring each week during the semester. Students will earn one point per half-hour of tutoring, and are required to earn 100 points. Students can earn up to a maximum of 110 points for SI Tutoring, and this grade is worth 5% of the overall course grade. Details will be provided during the first day of class.

- Electronic Devices

  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.

  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.

  Students are not to be in possession of electronic devices (phones, music players, watches, etc) during an exam. Student found with devices other than scientific calculators during an exam will earn a grade of zero on that exam.

- Laboratory Experiments

  There will be 10 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. Any student that does not complete at least 7 experiments with a non-zero grade will earn a grade of "**F**" in this 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 25% of your overall course grade.*

Regular Experiments	75%
Lab Practical	15%
Behavior, Safety, & Teamwork	10%
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!***
- ***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.
- ***Students are required to attend the laboratory section in which they are registered.*** Students arriving for a laboratory session in which they are not registered without prior permission will be asked to leave and will earn a grade of zero for that experiment, regardless of the student's preparedness for lab. Under certain special circumstances, students may attend a different laboratory session from which they are registered. This must be cleared with both the lecture instructor and laboratory instructor in advance.

- 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). Any student not completing the Lab Practical will earn a grade of "**F**" in this course.

- Withdrawal Date (Drop Date)

  Thursday, April 9 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.

Student Responsibilities/Expectations:

This course covers a lot of material and moves rapidly, so do not fall behind. If you do not understand Chapter 1, you will probably not understand Chapter 2 either, because the material for this course is cumulative.

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 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.

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.

NTCC Academic Honesty/Ethics Statement:

NTCC upholds the highest standards of academic integrity. The college expects all students to engage in their academic pursuits in an honest manner that is beyond reproach using their intellect and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. This course will follow the NTCC Academic Honesty and Academic Ethics policies stated in the Student Handbook. Refer to the student handbook for more information on these subjects.

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 request accommodations. An appointment can be made with the Academic Advisor/Coordinator of Special Populations located in Student Services and can be reached at 903-434-8264. For more information and to obtain a copy of the Request for Accommodations, please refer to the special populations page on the NTCC website.

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.

Tentative Course Timeline (*note* instructor reserves the right to make adjustments to this timeline at any point in the term):

We will cover nearly all of the material in Chapters 11, 13-20, 22 and parts of Chapter 8 in the text. More detail can be found by examining the Table of Contents in the text and the "Topical Course Outline" posted on Blackboard.

Week 1	Intermolecular Forces, Liquids
Week 2	Phase Changes, Phase Diagrams, Solutions, Concentration
Week 3	Colligative Properties – EXAM 1
Week 4	Kinetics: Reaction Rates
Week 5	Kinetics: Reaction Mechanisms
Week 6	Nuclear Chemistry and Its Applications – EXAM 2
Week 7	Equilibrium: Introduction, Equilibrium Constant, Le Châtelier's Principle
Week 8	Equilibrium: Acids & Bases, pH, Ka, Kb
Week 9	SPRING BREAK
Week 10	Equilibrium: Salts, Polyprotic Acids, Lewis Acids and Bases, Buffers – MIDTERM 3
Week 11	Equilibrium: Acid-Base Titrations, Solubility, Precipitation

Week 12	Thermodynamics: 2nd and 3rd Laws, Entropy, Free Energy
Week 13	EXAM 4 – Oxidation/Reduction Reactions
Week 14	Electrochemistry: Voltaic Cells, Non-Standard Conditions, Equilibrium, Batteries
Week 15	Electrolysis, Coordination Compounds
Week 16	Crystal Field Theory Color – MIDTERM 5
Week 17	ACS FINAL EXAM

NTCC Spring Graduation – Saturday, May 16