

General Chemistry, Chm 203 & 204 Sections D and H

with Dr. Bruce Mattson – Fall Semester, 2019

Syllabus & Course Information

Chm 203 and 204 are paired lecture and laboratory courses in introductory chemistry. I am your instructor for both. These courses are the first half of a two-semester sequence. We will study Chapters 1 – 12 of our textbook this semester, and use the same textbook next semester.

Fit to Mission. By now, you have most likely encountered the Mission Statement of Creighton University (<http://www.creighton.edu/about/mission>). The fifth and sixth paragraphs are especially pertinent to freshmen making the transition to the spiritual and academic life at Creighton:

Creighton exists for students and learning. Members of the Creighton community are challenged to reflect on transcendent values, including their relationship with God, in an atmosphere of freedom of inquiry, belief and religious worship. Service to others, the importance of family life, the inalienable worth of each individual and appreciation of ethnic and cultural diversity are core values of Creighton.

Creighton faculty members conduct research to enhance teaching, to contribute to the betterment of society, and to discover new knowledge. Faculty and staff stimulate critical and creative thinking and provide ethical perspectives for dealing with an increasingly complex world.

Jesuit Charisms. To learn more about how the Jesuits teach us to live the Mission, read the central Jesuit charisms (see <http://www.creighton.edu/cte/preparing-teach/mission-and-identity>): “A charism is a grace or talent granted by God... At a Jesuit university, these charisms help to define how we interact with... each other.” The most common charisms are:

<i>Cura personalis</i>	<i>Care for the whole person: body, mind and spirit Dedication to promoting human dignity Being open to and accepting a person's religious, spiritual and cultural development</i>
<i>Faith that Does Justice</i>	<i>Seeking justice for all God's creatures, especially the poor and marginalized Working actively for and with the poor, and to be just as active in reflecting on God's presence in their work and their relationships</i>
<i>Finding God in All Things</i>	<i>An invitation to spiritually encounter God's beauty in everything we come to know in our lives Accomplished through an ongoing process of personal discernment</i>
<i>Women and Men for and with Others</i>	<i>More than just giving and providing service to those in need, but working with or alongside of those we serve to promote solidarity Recognizing that all humans have physical, emotional, and spiritual needs</i>

Think about how these charisms apply to chemistry, to our class, to your relationship with each other and with me, to the study of chemistry and learning together. Read these again from time to time and use them to interpret your experience in our class together. May they guide and inspire you to be your very best. The Chemistry Department has a Mission Statement that closely reflects these charisms:

Chemistry and You: Our Mission and Promise

The Department of Chemistry strives for excellence in all its programs. We are dedicated to helping our faculty, staff and students discover their talents and abilities and develop them to the fullest, inspiring critical and creative thinking. By providing a broad array of pedagogical approaches including innovative lecture courses and significant laboratory experiences, we are committed to challenging our students to think rigorously and act as ethical scientists and responsible citizens. We seek to offer our faculty opportunities to grow as scholars and teachers, and encourage our students to join us as active participants in our scholarly endeavors, especially independent research. We emphasize the values of trust, respect for others, inclusivity, and personal and professional integrity in the best sense of the Jesuit educational tradition.

Approved by the Chemistry Department 11 April 2019

As a student, you can live the mission and model the charisms:

- First and foremost: Believe in yourself and your ability.
- Help each other learn. Chm 203 and 204 are not graded on a curve in my class, so we are not in a competition for good grades. We are all trying to be successful.
- Treat each other with respect and dignity.
- Attend class every time, be prepared, attentive and fully engaged.
- Reflect on the beauty, the simplicity as well as the complexity of the various chemical concepts, and especially how the concepts work together to help us understand how nature works from a chemistry point of view.
- Ask questions when something is unclear. Others are likely confused on the same point.
- Take thorough and complete notes – write down key discussion points – anticipate answers during discussions – and be ready to explain things to the person next to you.
- Study chemistry (do homework) daily. This is a great chance to form a study group.
- Behave in a professional manner, as expected of a Creighton student

Why should you do these things?

- You will be fully engaged in classroom activities, maximizing learning.
- You may develop a love for chemistry.
- You will develop powerful skills that can be used to interpret the world around us, and to critique and analyze things you hear being promulgated by non-scientists.
- Conducting yourself professionally is a sign of maturity and personal integrity.
- You will have a better chance of earning a good grade in the course.
- You will have a better chance of making a positive impression on me. Over the next few semesters, you may think of me for a possible reference (for student leadership programs, scholarships, pharmacy school application, etc.). You have an opportunity this semester in lecture and lab to make a favorable impression.

Items I consider for Letters of Recommendation: Your Checklist

- Intellectual aptitude
 - Did I earn a grade of B or better in lecture and a B+ or better in lab?
 - Did I perform at the 75th percentile or better on the national standardized final exam?
- Mature, reliable, dependable, professional
 - Were my exam scores consistent?
 - Did I show initiative? Did I finish assigned problems and seek help if needed?
 - Was I motivated and did I exhibit good classroom and laboratory work habits and work ethic (attentive, focused, actively engaged in learning)?
 - Did I turn in all work on time, such as lab reports, and on-line data?
 - Was I punctual to class and lab? Was I ready so class could start on time?
 - Was my behavior dignified and professional?
 - Did I show leadership qualities by setting a good example?
 - Was I consistently prepared for class and lab? Did I bring my calculator to lecture and lab? Did I bring my safety glasses to lab? Did I bring my computer to lab?
- Integrity (moral principles and core values)
 - Was I honest (truthful, forthright, straightforward, candid, open)?
- Working with others, interpersonal relationships
 - Was I respectful of others (courteous, polite, considerate, kind, and civil)?

Avoid distracting behavior. As a courtesy to your fellow students and to me...

- arrive on time and avoid coming and going during class.
- do not sleep, whisper, daydream, study other subjects, etc.
- put away your cell phone and your laptop and participate in learning wired-free during class time. Same goes for smart watches.

Part 1 Chm 203

- 1. Chm 203.** This course is designed for students with a good background in chemistry and math, especially algebra, setting up and solving word problems, use of scientific notation, and logarithms. Much of the material in Chm 203 should be familiar to you. (The Chm 204 specific syllabus follows.)

This syllabus contains course information that will be of use throughout the semester. The syllabus is our agreement as we work our way through the course. All policy questions are answered herein. Deviating from the agreement will not occur in fairness to the class as a whole.

As your chemistry professor, I wish you success in the course. I am here to help you! My best advice is to stay on schedule! Catching up is difficult and never as effective as staying on top from the start. The “A” and “B” students do their homework every day, typically working on chemistry about two hours for every one hour lecture. By doing so, they learn and retain the concepts. Cramming simply does not work in a science skills application course and almost always leads to unfortunate results on the comprehensive final exam.

- 2. Textbook and Calculator.** Required for the course:

Text: **Chemistry**, by Robinson, McMurry, and Fay, 8th Edition.

Simple scientific calculator (non-programmable)

- 3. Course website.** This course is supported by a website. The site includes all of the course information, copies of handouts, previous years' exams, etc. Link to it from the website mattson.creighton.edu. Click on Chm 203 or Chm 204. These web pages function in lieu of using Blueline.
- 4. Course Communication.** I will notify you by e-mail of any changes to the schedule or of any pertinent details that may come up. Check your Creighton e-mail regularly and keep your mailbox operational.
- 5. Office, e-Mail.** My office is Hixson 262. Stopping by my office is always the best idea for getting help. Contacting me by e-mail also works well: e-Mail: brucemattson@creighton.edu
- 6. Office Hours.** Office hours are those hours during which I am in my office (HL-262) and available for answering questions and discussing and studying chemistry. On my office door, I post a weekly schedule. I have many office hours throughout the week. Check my door to see if I am available. When my door is open, you are welcome to come in! If you prefer an appointment, sign up on my door for a time. Visiting in my office helps me learn your name, which should be one of your personal objectives this semester.
- 7. Attendance Policy.** I require attendance. I feel that I have information that will be useful and interesting I know that attending my lectures will help you on the exams.
- 8. Daily worksheets.** On most days I will distribute a worksheet with problems that you should be able to do after the day's lecture. Complete the worksheet prior to the next class meeting.
- 9. Learning Objectives and assigned homework problems.** Learning objectives are provided at the end of each chapter. For example, in Chapter 1, these are on pages 25 and 26 (pages 26 and 27 in the 7th Edition). Assigned problems are provided on each daily worksheet. Working problems is the single most important way to prepare for tests. Use my office hours to ask questions about these problems. Work problems on a daily basis. Perhaps form a Study Group! Assigned problems often appear on exams. Do not get behind.
- 10. Course Content.** A day-by-day (calendar) list of activities is included with this information. Changes and adjustments to the content are possible.
- 11. Nomenclature.** In Chapter 2 we will encounter nomenclature – how to name substances. Nomenclature provides a foundation for the rest of the course, and even subsequent science courses. Each exam this semester will have a section worth 10 points that tests your aptitude on nomenclature. There will be opportunities to become “Nomenclature Certified,” after which you no longer need to complete the nomenclature portion of subsequent exams.
- 12. Unit Exams.** There are five unit exams this semester. The exams are based on the lecture material, assigned material from the text and the homework problems. You will be allowed to use a non-programmable calculator on the exams. Each of the exams is worth 100 points. Exams will be returned as soon as possible after the exam date, usually by the next class meeting. If you are not present when the exams are returned, you may pick it up during my office hours.
- 13. Re-grading policy.** A grade appeal for an exam must be made to me within three school days of the date on which the exam is returned to the class. I make scans of your exams and re-grading is done from the scans. After that the grade book is closed and re-grading for additional points will no longer be possible.
- 14. Grade reports.** After each exam, starting with the second exam, you will receive a grade report by e-mail.

15. Missed exams. Taking the exam at the assigned time is expected. If you cannot take the exam at the assigned time, you should have a pre-approved excuse with appropriate paper documentation. Other excuses, regardless of how compelling, constitute being absent from exam. Avoid missing exams! There are two types of missed exams: **Excused** and **Absent from Exam**.

- **Excused exams** include documented reasons for being absent, including being out of town for CU sports participation, attending an important family function such as a wedding or a funeral, a court appearance, a sanctioned campus function and the like. You must provide me with approved documentation (such as a copy of the wedding invitation) in order for it to be considered an excused absence. Being ill with an authenticated medical excuse that requires hospitalization or departure from campus for purposes of recovery is considered an excused absence – the easiest way to authenticate your medical excuse is to have your college dean’s office send an e-mail to all of your professors stating that you have a medical excuse for not attending any classes or labs. (Notes from Student Health or a doctor’s office for an illness contracted shortly before the test does not count as an excused absence.) I reserve the right to not accept a particular excuse. Missed exams with excused absences can be made-up as soon as possible after the actual exam, but not after the exams are returned in class – this means that the exam must be completed by 8:00 AM on the next day that the class meets. Excused absence exams that are not completed before the exams are returned in class are reclassified as **Absent from Exam**.
- **Absent from exam = Make-up Exam.** Failure to take the exam with your classmates, except for an excused absence, constitutes being Absent from Exam. This includes becoming sick the day or night before the exam, accidentally sleeping through the exam, feeling unprepared to take the exam, or failing to complete an excused absence exam on time. Students who are classified as Absent from Exam will be given a make-up exam. *The format of the make-up exam is multiple choice, which by virtue is more difficult than my normal exams as there is no partial credit.* Make-up exams must be completed within five school days of the original exam, after which the score will be entered as zero. Students missing Exam 5 will have until 3 pm on Monday, December 9, 2019 to complete the make-up exam. Students with excuses from their dean’s office for prolonged absences will have ten days starting with their first day back in classes. Students are allowed only one make-up exam per semester. Additional absences will receive a grade of zero. Make-up exams are not returned but may be reviewed in my office.

16. Problem Club with Kendall. Our class has an attached tutor assigned to it, Ms. Kendall Cameranesi. She takes notes and conducts two evening tutorials per week (7:30 – 9:00 PM Sundays and Thursdays. Before Exams 2 and 5, which are on Wednesdays, the review will be on Tuesdays, October 22 and December 3 instead of the Thursday after the exam.). The EDGE also provides chemistry tutors on a walk-in basis. EDGE tutors are available Sunday — Thursday evenings from 6 – 9 PM.

17. Final Exam. The final exam is a comprehensive exam covering the entire semester and is worth 100 points. Your score on the final will equal your national percentile score averaged with 100. If national norms are not available (because it is a new exam or the sample size is too small), a formula will be used that yields results consistent with the class’s previous performance over Exams 1 – 5 (the formula will give a class average for the final that is the same as the class average on the previous exams). The final exam is scheduled for 3:30 on Tuesday, 10 December 2019.

18. Course Grade. You will receive periodic grade reports via e-mail. The course is worth 600 points in total. Please note that your grade in this course is wholly determined by your exam grades. There is no other way to earn points, so be prepared for each exam by attending class, doing your homework, and making sure you understand all concepts. Course points are distributed as follows:

Exams 1 – 5:	500 points
Final Exam	100 points
Total	600 points

The grade you will be assigned can be determined as follows. Note: These are absolute cut-offs.

A (4.00) ≥ 93.00%	A- (3.67) ≥ 89.00%	
B+ (3.33) ≥ 85.00%	B (3.00) ≥ 81.00%	B- (2.67) > 77.00%
C+ (2.33) ≥ 73.00%	C (2.00) ≥ 69.00%	C- (1.67) ≥ 66.00%
D (1.00) > 60.00%		

19. Cell phones, e-tablets and laptops. Use of cell phones (calling, texting) during class is not allowed. Cell phones must be left in backpacks, purse, etc.

20. What if Creighton is closed? If the University is closed for the day due to weather, we will not meet. Sometimes the University has a late start to allow the grounds crew to clear the parking lots. If the University opens at 10 AM, our class not meet but if I can negotiate the streets, I will be in my office for question and answer session – e-mail me to make sure I am in. Note: This item is different for Chm 204 – see below.

20. Dropping the course? If you have a D or F grade at midterm, you may wonder about dropping the course. The last day to drop the course with a W is Friday, 8 November 2019. By then you will have taken three exams. The e-mail grade reports I send out will indicate what you need to achieve on all subsequent exams (including the final) in order to improve your grade. If you have a D or F for a midterm grade, consult with me about your best next move. If you decide to not drop the course with the resolve to improve your grades, you are taking a serious risk that rarely succeeds. Most students do not improve their grade simply by determination because they are missing too much of the introductory material and the content builds on previous content. The best decision for such students is to drop the course and repeat it fresh from the start. After the drop date, there are no options left – you will receive the grade you earned.

21. Academic Integrity. The University has an established policy on academic dishonesty. The University defines the term to include “representing the work of others to be one’s own (cheating on an exam), tampering with the experiments of others, defacing or tampering with library or student materials or facilitating dishonesty on an exam.” The latter point is understood to include situations where you notice cheating occurring but do not report it immediately. In General Chemistry, the most blatant forms of academic dishonesty include: (a) copying the work of others on exams, (b) sharing information with others about exams (both during the exam or between class periods, (c) using notes when notes are not allowed (in calculator slip covers, palms of hands, baseball caps, slips of paper tucked away, and so on), (d) making changes on graded materials that have been returned to you, (e) working together on take-home exam problems when that is expressly forbidden (This does not pertain to us.), (f) cell phone photographing or texting exam information or answers, (g) sharing calculators during the exam, and so on.

As a member of the Creighton community, promise yourself and Creighton to join others:

- ❖ committing ourselves to the pursuit of knowledge throughout our lives and to developing the skills that we have been given.
- ❖ acknowledging our obligation to respect all women and men and to use wisely the resources of the world around us.
- ❖ solemnly promising to uphold the highest moral and ethical standards and thus to bring credit to the College by our life and our work.

Any act of academic dishonesty tarnishes and diminishes the worth of each of these promises. Remember your promises. Keep your promises. Live up to your promises. Extend these promises into lifelong promises to yourself and others. You will not be disappointed.

In the event that you are accused of engaging in academic dishonesty, you will receive a “0” for the exam. The incident will be reported in writing in accordance with the protocol set forth by the College of Arts and Sciences. For details, see the website www.creighton.edu/ccas/ then follow links: Current Students > Student Resources > Policies and Procedures > Academic Honesty Policy. Students accused of academic dishonesty have the right to an appeal the grade of 0.

22. Appealing the final grade. After I have determined your final grade, I do consider cases that are within 0.7% of the next cut-off (4 points). IF you are that close to the next better grade AND your score on the final exam is at least as good as the grade you desire, you will get the better grade. NO other cases will be considered in fairness to the class as a whole.

23. Chm 203 Learning Objectives in common with all sections/instructors. Students will be able to:

1. evaluate and comment on the accuracy, precision and the propagation of error in measurements.
2. convert correctly between different units of measurement.
3. identify and count the number of subatomic particles in isotopes and calculate average atomic mass.
4. recognize stoichiometric relationships, relate quantities of reactants and products in a balanced chemical reaction and calculate yields.
5. write correct names and formulas for ionic, acid and binary molecular compounds.
6. classify and balance acid-base, precipitation and reduction-oxidation reactions, while also considering the dissociation of ionic particles in solution.
7. characterize atomic orbitals and connect the construct of the periodic table to elementary quantum theory.
8. predict electron configuration of atoms and ions using the periodic table and identify periodic trends of atomic and ionic properties.
9. draw Lewis (electron-dot) structures correctly.
10. utilize VSEPR theory to predict molecular geometry, polarity and intermolecular forces.
11. calculate work and enthalpy changes for chemical processes.
12. explain the behavior of gases and calculate some physical quantities using the ideal gas approximation.
13. relate the physical properties of solids, liquids and gases to the interactions between particles.

CHM 204 Course Syllabus (Dr. Mattson) General Chemistry Laboratory Fall Semester 2019

Section DD Tuesdays at 8:00 AM and HH Tuesdays at 11:00 AM

Instructor: Dr. Bruce Mattson Office: HLS 262; email: brucemattson@creighton.edu

Teaching Assistants:

Section DD:
Shelley Helmeke
Mirielle Mason
Ashlyn Okada

Section HH:
Christy Heimbrecht
Karolina Rooney
Emma Travis

Website for Chm 204 with Dr. Mattson (you can link to it from the Chm 203 website):

http://mattson.creighton.edu/GenChemWeb/Lab/Chm_204.html

Introduction: The experiments in this course have been designed to complement the topics covered in CHM 203, General Chemistry Lecture. This course consists of a laboratory period that will begin with a discussion of the experiment to be done. As a student in this course, you must come to lab sufficiently prepared. All experimental work will be done during the lab period.

Lab specific Objectives: You will...

- understand the chemical principles that pertain to each experiment.
- participate in laboratory experiences designed to cover concepts related to Chm 203.
- maintain responsible work habits in the laboratory.
- report your findings honestly and will not take credit for work done by others.
- know how to experimentally determine various quantities including mass, volume, concentration, density, quantity of heat, and molar mass.
- learn how to prepare inorganic substances from carefully conducted chemical reactions.
- properly use the following equipment and glassware: analytical balances, burettes, volumetric pipettes, Mohr pipettes, and graduated cylinders.
- be able to understand an experimental procedure, perform it, and obtain accurate results.
- handle chemicals in a safe manner.
- maintain a laboratory notebook, recording experimental procedures, data, and observations for each experiment in such detail that the experiment could be repeated by another individual using only your laboratory notebook. You should record all data and observations in a complete and organized manner.
- analyze experimental data and draw appropriate conclusions from the data.
- prepare graphs using Microsoft Excel and interpret the data from them.
- identify sources of error in an experiment and explain how they affect the results.

Required Materials: (Items 1 – 3 available from the Chemistry Stockroom)

- 1) General Chemistry I Laboratory Manual, Fall 2019
- 2) Laboratory Notebook
- 3) Safety goggles or approved safety glasses. I will provide a storage drawer if you wish to store them from week to week.
- 4) Scientific calculator
- 5) A personal laptop computer

Safety. You must follow the safety regulations at all times in the laboratory. Safety regulations are in place to protect you and those around you. You must know and observe all of the safety rules listed in the laboratory manual. If you have safety glasses that were not purchased from the Chemistry Department Stockroom, you must check with me to ensure that they meet Creighton and OSHA safety standards.

Chemical Waste Disposal. All chemical wastes will be disposed of in the proper waste containers. Do NOT put any chemicals in the sinks or wastebaskets unless specifically instructed to do so.

Breakage. You are responsible for equipment broken or damaged. If you owe more than \$10, you must pay the Stockroom before receiving the replacement.

Cleaning Up. Before leaving the lab each day, you must make sure that the bench-top, balances, and the area around the balances are clean.

Grading: There are 600 points possible in Chm 204 – twelve experiments at 50 points each. Chm 204 grade cut-offs are the same as Chm 203 cut-offs.

Format for each experiment.

Prior to lab: Pre-lab Presentations: Each week it is your responsibility to study the pre-lab presentation (*Chem Lab with Stick People and Bird*) available from the Chm 204 website. These presentations function as your introduction to the upcoming experiment and are useful in writing your introductions, which are due before lab begins.

Prior to lab: Introduction: You are required to write an introduction to the experiment prior to coming to lab. This is explained in detail in the pre-lab presentation to Experiment 1. We will check your introductions while you are taking the quiz.

Lab Quizzes: There is a weekly quiz at the start of each lab period. The quiz is multiple choice and is ten questions long. The first six questions cover the previous week's experiment and the last four cover the pre-laboratory presentation available at the web site. The quiz typically lasts ten minutes. There are never any calculations on the quiz.

Introductory comments: After the quiz, Dr. Mattson may make a few experiment-specific comments.

Perform the experiment and complete lab report.

Absent from lab: Set up a system with your lab partner to make sure both of you are planning to attend lab. If you are absent for any reason, you must make-up the lab with another professor before the end of the experiment in question, which is Thursday this semester. Arrange with the host professor and she/he must agree that you can be their guest. As a guest, you must do what is expected in their section, not ours. You will take their quiz, and turn in your lab report to the host professor of the lab. That professor will have the report graded and return it to me. Upon return to lab the following week, you should ask me if I have received your graded lab report from the host professor. If I have not, it is your responsibility to follow up with the host professor.

Pre-scheduled Absence from lab: If you know you are going to be absent from lab (sports travel, for example), it is prudent to notify me as well as to schedule a make-up lab with another professor for some other time during the week. Labs meet from Monday afternoon through the end of Thursday, so there are plenty to choose from. Participation in another lab is by permission only. Some labs do not have available space. All information provided in the previous section on "Absent from lab" apply. For best score, pick a lab that is having a quiz.

Laboratory reports (Sample lab report cover page on the next page). Each experiment is always worth 40 points and the weekly quiz is worth 10 points for a total of 50 pts. A template cover sheet for the experiment to be performed is given on the next page. A few comments on each part:

Part 1. General appearance, purpose, and quality of pre-lab notes. This section is worth 5 points.

Part 2. Experimental Details, Observations, Calculations and Results. This section is worth 10 – 35 points. A number of experiment-specific items are called for here. Treat this section like a checklist for completion of the experimental requirements. Read carefully! Watch your units and significant figures!

Part 3. Conclusions (typically 3 pts). Writing a good conclusion is discussed in the pre-lab presentation to Experiment 3.

Part 4. Sources of error (typically 3 pts). If you feel like something went wrong, especially if your results seem inaccurate, you should address that issue here. If everything went well, it is appropriate to state, "No errors noticed." Note: In many cases where an error is known to have occurred (e.g. you spilled a reagent), you can simply repeat part or all of the experiment if time allows. Writing about sources of error is discussed in the pre-lab presentation to Experiments 2 and 3.

Part 5. On-line results. (0 – 20 pts) Many experiments have a component in which you and your lab partner together submit one set of data for the pair of you. The results are analyzed carefully for proper use of units and significant figures, and your calculations are checked. The link to the on-line data form is given at the lab website. The data are collected in a time-stamped Google Form. Submit your data before you leave lab. Data submitted after the deadline will not be graded, but 40% credit will be awarded if the results are submitted by 11:59 PM on the day of the lab. After your data have been successfully submitted, you will receive a 5-digit confirmation number that you record on your cover sheet.

Format of a typical cover sheet:

Name: _____

Partner: _____

Lab Station: 1 2 3 4 5 6 7 8 9 10 11 12

Circle your section: DD (8 AM) or HH (11 AM)

Note: Penalty point(s) apply if incomplete information, rough edges, not stapled

CHM 204 General Chemistry I Lab

Day Month Year

Experiment X. Name of Experiment

1. Introduction, general appearance, quality and thoroughness

5 pts

For use by the TAs: Introduction. Was the main purpose/objective correctly stated in the introduction? (Use material from the pre-lab presentation and the lab manual) _____ out of 3
Compared to the other reports you graded this week, how would you rate this report? In terms of...
... clarity and easy-to-follow details and calculations? Best Good Fair Poor Score: 0 ½ 1
... thoroughness (introduction, details, observations, conclusions)? Best Good Fair Poor Score: 0 ½ 1
Score: _____ TA Score: _____ out of 5

2. Experimental Details, Observations, Calculations and Results

17 pts

i. Show all calculations ... Record all experimental data in your lab notebook with correct units and significant figures along with all observations, including things that went wrong.	(score)
ii. Show how you ...	(score)
iii. Attach graph of ...	(score)

3. Conclusion (Results, Discussion)

3 pts

This discussion pertains to ... We will read your discussion carefully.

4. Sources of error

3 pts

5. Complete the on-line form before leaving lab today!

12 pts

Results received after the end of the lab period are not evaluated, however 30% will be given as credit if submitted before 11:59 PM today. Enter your 5-digit confirmation number:

Enter your names, station, e-mail address information
Questions 1. (Here I list the essence of each question)
Question 2...

Question 3...
Details about significant figures and units, if appropriate.

Earned points: Lab report (25 pts)

_____ out of 28

Earned points: On-line data: (15 pts)

_____ out of 12

Quiz score:

_____ out of 10

Penalty points (see syllabus): Reason: _____

Total score:

_____ out of 50

A = 45 – 50; B+ = 42.5 – 45; B = 40 – 42.5; C+ = 37.5 – 40; C = 35 – 37.5; D = 30 – 35

Penalty points

- Late to lab:** Arrive on time! Lab starts with the Quiz worth 10 points. Typically, the quiz takes <15 minutes. There are no make-up quizzes. If you arrive a few minutes late, you will have less time for the quiz, but you can earn some points. You cannot work past the end of the quiz. If you arrive after the quiz is over, your quiz score is zero. After the quiz is over, late penalties of 1 point per minute apply. Not participating in an engaged, professional manner in the lab activity is the same as being absent.
- Lab report turned in late.** Lab reports are usually due before the start of class on Wednesday following the lab experiment (no later than 9:29 AM for Section DD, and no later than 10:59 AM for Section HH). You may hand them in earlier – even immediately following lab. A lab report handed in later on Wednesday, but prior to 1 pm is penalized 3 points. If the lab report is handed in later than 1:00 PM on the Wednesday, it will receive a score of 50% of the point value of the report portion as a participation grade, but will not be graded. If it is handed more than 6 days late, the report portion counts for no credit. Note: your quiz score and on-line score will always be counted for full credit.

- 3. Missing information.** Missing information includes incomplete header information on lab report (lab partner name, section, station), quiz header information, etc. Typical: 1 point penalty.
- 4. Safety violations:** Any activity deemed to be unsafe will result in a safety penalty of no less than 5 points. Not wearing safety goggles will result in a 5 point penalty for each occurrence. Safety violations range from 5 – 50 pts
- 5. Misuse of laboratory time** (e.g., using cell phone, texting): One of the course objectives is: “You will maintain a responsible work habit in the laboratory.” Excessive visiting, fooling around, general misbehavior, misuse of cell phones (texting, talking) and similar activities is not allowed in the lab. Under most circumstances, students will receive one warning. Typical penalties are 5 – 10 pts
- 6. Failure to clean up equipment, glassware and work area:** Glassware must be left clean and well-organized for the next group of students. All of the equipment must be present. If you find the equipment dirty when you arrive, please notify Dr. Mattson and he will report the situation to the laboratory instructor of the previous section. Penalty: 5 pts

Miscellaneous information for individuals:

Missing partner? Notify me (Dr. Mattson) if your partner is absent. I will pair you with another unpaired individual or make other arrangements. Do not join another group on your own.

Make-up lab. In cases where the lab cannot be made up, there will be a make-up lab on Tuesday, 4 December 2018. Only one lab can be made-up at the end of the semester; subsequent absences are graded as zero.

TAs: We will have three undergraduate TAs to aid with safety and to help answer questions and provide tips in the lab. Each TA will work closely with four of the stations in the lab.

University Closure. If the university is closed for the day, the lab is cancelled and the course point total will be reduced by 50 pts for each closure. The first closure will reduce the point total for the course from 600 to 550 pts, and so on. If the University has a 10:00 AM late start, Section DD will not have lab, but Section HH will have lab.

Course communication: All official course communication and announcements will take place via e-mail to your Creighton University e-mail account, and announced in class, if possible. It is your responsibility to check your Creighton e-mail regularly and to ensure that your inbox is empty enough to accept incoming e-mails.

Academic Dishonesty: In addition to the academic integrity statement given above for Chm 203, some additional lab-specific comments are: Cheating in any form will NOT be tolerated. This includes, but is not limited to, copying old or new lab reports, copying another student's lab reports, and/or falsifying data. You and your lab partner are welcome to discuss your answers and calculations with other students in the lab, with your TAs, and with me. The lab report, however, must be written in your own words and based upon your own work.

Chm 204 Learning Objectives in common with all sections/instructors. Students will be able to:

1. maintain a laboratory notebook to accepted standards.
2. identify common laboratory glassware and appropriately choose, use and properly read measurements from laboratory glassware.
3. evaluate and comment on the accuracy, precision and the propagation of error in measurements.
4. properly identify the number of significant figures in measurements and reported values.
5. correctly determine the number of significant figures in values calculated by addition/subtraction and multiplication/division
6. use dimensional analysis to perform calculations and convert correctly between different units of measurement.
7. perform dilutions and calculate concentrations of diluted solution
8. write correct names and formulas for ionic compounds, acids and binary molecules.
9. write molecular and net ionic equations based on observations made in the laboratory
10. collect and interpret data collected electronically
11. recognize stoichiometric relationships, relate quantities of reactants and products in a balanced chemical reaction and calculate theoretical and percent yields.
12. draw Lewis (electron-dot) structures, build models of small molecules and utilize VSEPR theory to predict molecular geometry, polarity and intermolecular forces.
13. perform an acid-base titration
14. use a calorimeter to determine the enthalpy of reactions

August 2019

Monday	Tuesday	Wednesday	Thursday	Friday
19	20	21 Course intro; Chapter 1. Chemical Tools: Experiment- ation & Measurement Sections 1.1 – 1.6	22 Buy lab stuff. Pick your lab partner and lab station. Rigge 121	23 Chap.1. Experimentation... Sect. 1.7 – 1.8
26 Chap.1. Experi- mentation Sect. 1.11 (Sections 1.9 and 1.10 covered in lab)	27 Expt 1. Introduction to lab (All lab experiments start with a quiz.)	28 Chap.2. Atoms, Molecules, Ions... Sections 2.1 – 2.5	29	30 Chap. 2 Atoms... Sections 2.10 – 2.12

September 2019

Monday	Tuesday	Wednesday	Thursday	Friday
2 Labor Day No class	3 Expt 2. Qualitative Analysis	4 Chap. 2 Atoms... Sections 2.6 – 2.9	5	6 Catch-up & Review Optional nomenclature quiz
9 Exam 1 Chap. 1 & 2	10 Expt 3. Elemental Analysis (Text: Sect 3.7, 3.8)	11 Mass of the Holy Spirit. No class today, but you can pick up your exam.	12	13 Chapter 3. Mass Relationships in Chemical Reactions Sections 3.1 – 3.3
16 Ch. 3 Eq'ns & ... Sections 3.4 – 3.5	17 Expt 4. Synthesis of a copper salt (Text: Sect. 3.2 – 3.5)	18 Ch. 3 Eq'ns & ... Sections 3.6 – 3.8	19	20 Chapter 4. Reactions in Aqueous Solutions Sections 4.1 – 4.3
23 Chap. 4 Aqueous Rxns Sections 4.5 – 4.9	24 Expt 5. Classes of Chemical Reactions (Text: Sect. 4.3 – 4.7, 4.10)	25 Catch-up & Review	26	27 Exam 2 Chap. 3 and first part of 4 (Sections 4.1 - 4.3, 4.5 -4.9)

October 2019

Monday	Tuesday	Wednesday	Thursday	Friday
Sept. 30 Chap. 4 Aqueous Rxns Sections 4.10 – 4.11, 4.4, 4.13	Oct. 1 Expt 6. Precipitation reactions ... (Text: Sect. 4.3 – 4.7, 4.10)	2 Chap. 5. Periodic Properties & atomic structure Sections 5.1 – 5.4	3	4 Chap. 5. Periodic Properties & atomic structure Sections 5.5 – 5.8
7 Chap. 5. Periodic Properties & atomic structure Sections 5.9 – 5.14	8 Expt 7. Preparation of Solutions (Text: Sect. 4.3, 4.5, 4.6)	9 Chapter 6 Ionics and periodic trends Sections 6.1 – 6.4	10	11 Chapter 6 Ionics and periodic trends Sections 6.5 – 6.8
B	R	E	A	K
21 Catch-up & Review	22 Expt 8. Acid- base titration (Text: Sect. 4.5, 4.7)	23 Exam 3 Chap. 4 (Sections 10 and 11) and Chapters 5 and 6 (thru 6.8)	24	25 Chapter 7 Covalent Bonding & Electron Dots Sections 7.1 – 7.6
28 Chapter 7 Covalent Bonding & Electron Dots Sect. 7.7 - 7.10	29 Expt 9. Molecular Structures Lab (This material is part of Chaps 7 and 8 and is on Exam 4.)	30 Chapter 8 Covalent Compounds & Molecular Structure Sections 8.1 – 8.4	31	

November 2019

Monday	Tuesday	Wednesday	Thursday	Friday
				1 Chapter 8 Covalent Compounds & Molecular Structure Sections 8.5 – 8.6
4 Chapter 9 Thermochemistry Sections 9.1 – 9.7	5 Expt 10. Intermolecular forces (Text: Sect. 8.5, 8.6)	6 Chapter 9 Thermochemistry Sections 9.8 – 9.10	7	8 Chapter 9 Thermochemistry Sections 9.12 – 9.13, Sections 6.7 Catch-up & Review Last day for W
11 Exam 4. Chapters 7 and 8, and 9. (includes material covered in Lab Expt 9)	12 Expt 11. Enthalpy of Neutralization (Text: Sect. 9.5 – 9.7)	13 Chapter 10 Gases Sections 10.1 – 10.4	14	15 Chapter 10 Gases Sect. 10.5 – 10.8
18 Chapter 11&12 Liquids and Solids Sections 9.11, 9.12, 11.1 – 11.4	19 Expt. 12. MM of a Gas (Text: Sect. 10.1 – 10.3)	20 Chapter 11&12 Liquids and Solids Sections 11.5, 12.1, 12.3	21 Please fill out your course evaluations! Your thoughts are much appreciated.	22 Chapter 11&12 Liquids and Solids Sections 12.3 – 12.6
25 No class today	26	27 Thanksgiving	28 Thanksgiving	29 Thanksgiving

December 2019

Monday	Tuesday	Wednesday	Thursday	Friday
2 Catch-up & Review	3 Make-up lab. To be announced.	4 Exam 5 Chapters 10 and 11	5 Make-up lab	6 Review for final
9	10 Final 3:30 pm			