Subject to change without notice

General Chemistry I – CHM 111, Hybrid Spring 2018
Section 005A and A5A
Monday 9:30am – 1:00pm, Room AA489

Instructor: Dr. Monica Feazell **Office:** Room 352, Bisdorf Building **Phone:** 703-845-4627
Email: mfeazell@nvcc.edu Webpage: http://blogs.nvcc.edu/mfeazell/

Office Hours (AA 352):

M 1 pm – 3 pm
T 9:30 am – 12:30 pm
Th 9:30 am – 12:30 pm
2 hours of office hours on-line per week (flexible)

Text: Provided by OpenStax College. Download for free at: https://openstaxcollege.org/textbooks/chemistry/get

Lab Manual: Chemistry 111 Laboratory Manual. By NVCC Alexandria Faculty.

Course Structure:
This course explores the fundamental laws, theories, and mathematical concepts of chemistry. It is designed primarily for science and engineering majors. It requires a strong background in mathematics.

This is a hybrid course: Much of the lecture for this course is online. There are online reading assignments, videos, PowerPoints, online prelectures, online prelabs, and online quizzes.

The in-person portion of this course will be used for problem solving and lab assignments. Attendance is mandatory.

Please go to: Computer Check to verify that your computer is set up correctly. You will need reliable highspeed internet for this class.

All course material will be available on Blackboard. If the College closes, please go to the Blackboard page for information.
You are responsible for checking Blackboard regularly for all announcements and postings.
You are also responsible for checking your VCCS email on a regular basis.

Last Day to Drop with Tuition Refund or change to audit – *January 29, 2018*
Last Day to withdraw from the course without grade penalty – *March 31, 2018*

Course Description: This is the first half in the two semester College chemistry series. The goal of this course is to become aware of the fundamental concepts and have a general understanding of chemistry. The emphasis will also be on problem solving and critical thinking skills. Topics to be covered include: Chemical Foundations; Atoms; Atomic Structure and Periodicity; Bonding; Molecules and Ions; Gases; Stoichiometry; Chemical Reactions; Thermochemistry.

Course Objectives: Some of the objectives of this course are:

- Applying the principles of scientific method and measurement.
- Describing the atomic structure, emphasizing the electron configuration of atoms and chemical periodicity.
- Naming and writing formulas for inorganic compounds and Completing and balancing chemical equations.
- Performing calculations involving stoichiometry, thermochemistry, unit conversions, molarity, density and percent composition.
- Determining the type of bonding, molecular structure and polarity of given compounds or molecules.

Required materials for every Class:
1) Splash-proof laboratory safety goggles **(you will not be allowed to do wet labs without your goggles)**
2) Proper shoes and clothes
3) Printed lab handout and rubric
4) Printed Study guide for the Chapter

You must print and bring the appropriate lab handout each week. You will lose 3 points for not having the handout with you. I do not have extra copies of the lab handout to give; you are responsible for printing them every week. Please don't wait until the last minute in case you run into printing issues. **You must bring to every lab meeting: your calculator, your safety goggles, pens/pencils/erasers and the printed lab handout and rubric!!**

Week of	Lecture Activity	Lab Activity	Assessment
01/22	Chapter 1 Study Guide	Math review/Safety Density and Measurements	- Safety Training (Blackboard) Will be available soon. - Math Review Due 01/22 - PreLab for Density and Measurements Due 01/21 11:59PM (blackboard) - PreLecture Ch. 1 Due 01/21 11:59PM (blackboard)
01/29	Finish Chapter 1 Start Chapter 2 Study Guide	Physical Separations (Wet Lab)	- Density and Measurements Due 01/29 - PreLab for Physical Separations Due 01/28 11:59PM (blackboard) - PreLecture Ch. 2 Due 01/28 11:59PM (blackboard) - Blackboard Quiz Ch. 1 Due 01/29 11:59PM
02/05	Finish Chapter 2 Study Guide	Chemical Nomenclature	- Physical Separations Due 02/05 - PreLab for Chemical Nomenclature Due 02/04 11:59PM (blackboard)
02/12	Chapter 3 Study Guide	**Exam 1**	- Chemical Nomenclature Due 02/12 - Blackboard Quiz Ch. 2 Due 02/11 11:59PM - PreLecture Ch. 3 Due 02/11 11:59PM (blackboard)
02/19	Finish Chapter 3 Start Chapter 4 Study Guide	Empirical Formula (Wet Lab)	- PreLab for Empirical Formula Due 02/18 11:59PM (blackboard) - PreLecture Ch. 4 Due 02/18 11:59PM (blackboard)
02/26	Chapter 4 Study Guide	Chemical Reactions (Wet Lab) Unlabeled Bottles (wet Lab)	- PreLab for Chemical Reactions and unlabeled bottles Due 02/25 11:59PM (blackboard) - Blackboard Quiz Ch. 3 Due 02/25 11:59PM - Empirical Formula Due 02/26
03/05	Chapter 4 Study Guide	Vinegar Titration (Wet Lab)	- PreLab for Vinegar Titration Due 03/05 11:59PM (blackboard) - Chemical Reactions and Unlabeled bottles Due 03/05
03/12	**No Class**	**Spring Break**	
03/19	Chapter 6 Study Guide	**Exam 2**	- Vinegar Titration Due 03/19 - PreLecture Ch. 6 Due 03/18 11:59PM (blackboard) - Blackboard Quiz Ch. 4 Due 03/18 11:59PM
03/26	Finish Chapter 6 Study Guide Start Chapter 7 and 8 Study Guide	Redox Titration (wet Lab)	- PreLab for Redox Titration Due 03/25 11:59PM (blackboard) - PreLecture Ch. 7/8 Due 03/25 11:59PM (blackboard)
04/02	Chapter 7 and 8 Study Guide	Emission Spectroscopy And Spectroscopic Analysis (wet Lab)	- Blackboard Quiz Ch. 6 Due 04/01 11:59PM - PreLab for Spectroscopy Due 04/01 11:59PM (blackboard) - Redox Titration Due 04/02
04/09	Chapter 7 and 8	Lewis Structures Part 1 and Lewis	- PreLab for Lewis 1 Due 04/08 11:59PM

	Study Guide	Structures Part 2	(blackboard) - PreLab for Lewis 2 Due 04/08 11:59PM (blackboard) - Spectroscopy Due 04/09
04/16	Chapter 9 Study Guide	**Exam 3**	- Lewis 1 Due 04/16 - Lewis 2 Due 04/16 - Blackboard Quiz Ch. 7/8 Due 04/15 11:59PM - PreLecture Ch. 9 Due 04/15 11:59PM (blackboard)
04/23	Finish Chapter 9 Study Guide	Gas Laws (wet Lab)	- PreLab for Gases Due 04/22 11:59PM (blackboard)
04/30	Start Chapter 5 Study Guide	Enthalpy of Hydration (wet Lab)	- Gases Due 04/30 - PreLab for Enthalpy Due 04/29 11:59PM (blackboard) - Blackboard Quiz Ch. 9 Due 04/29 11:59PM - PreLecture Ch. 5 Due 04/29 11:59PM (blackboard) - Enthalpy Due 04/30
05/07		**Final Exam**	- Blackboard Quiz Ch. 5 Due 05/06 11:59PM

Course Prerequisites: Satisfactory placement scores into ENG 111 and MTH 163 or completion of MTT 0-9.

Ground Rules: Try to be on time. If you happen to be late, please enter the classroom without causing any disturbance. If you have to leave early, you may do so quietly. **Unless you will use it for class (not browsing Facebook), please turn off all electronic equipment (iPads, laptops, cell phones etc.). You may leave the cell phone on vibrate mode if you are expecting an important phone call and attend the call by excusing yourself quietly.** Please do not disrupt the class in any way. *I reserve the right to ask you to leave the room if I decide that you are a distraction to others in the class.* A command of basic algebra is assumed, expected and required. You must have a calculator that can handle scientific notation, logarithms, and inverse logs. The TI-36X Pro is recommended. **If you use a TI 83, 84 or 89, I reserve the right to clear the memory before an exam. You must bring to every class: your calculator, pens/pencils, erasers, and a notebook with paper!!**

Grading:

Criteria for evaluation:

Blackboard quizzes: online quizzes will be given. The lowest two grades will be dropped. There will be no make-up quizzes. Each quiz will be worth 40 points. The due dates will be posted on blackboard, please check it regularly. The quizzes will be available one week before their due date. Since these quizzes will be in the form of a blackboard quiz, no late quizzes will be accepted. The deadline is posted in the syllabus (the students should take the quiz by 11:59 PM the day before class).

- There are no make-up quizzes. The lowest grade will be dropped.
- The quizzes are designed to be taken in 30 minutes, if you leave the quiz and go back, the time will still be running and once the 30 minutes have passed, you won't be able to access the quiz anymore.
- There will be only one chance to submit your answer, so please make sure that you are 100% sure before submitting it.
- There will not be backtracking for any of the quizzes. This means that you won't be able to go back to any question and change your answer once you have submitted it.

Pre-Lecture assignment: A series of pre-lecture assignments will be posted on blackboard. These assignments are designed to review the chapter material before the lecture. Each assignment will be worth 20 points and the lowest two grades will be dropped. The due dates will be posted on blackboard, please check it regularly. The prelectures will be available one week before their due date. Since these prelectures will be in the form of a blackboard quiz, no late prelectures will be accepted. The deadline is posted in the syllabus (the students should take the prelecture by 11:59 PM the day before class).

- There are no late prelectures. The lowest two grades will be dropped.
- The prelectures are designed to be taken in 20 minutes, if you leave the quiz and go back, the time will still be running and once the 20 minutes have passed, you won't be able to access the quiz anymore.
- There will be only one chance to submit your answer, so please make sure that you are 100% sure before submitting it.
- There will not be backtracking for any of the quizzes. This means that you won't be able to go back to any question and change your answer once you have submitted it.

In class exams: Three in class exams will be given during the course of the semester. The total grade contribution from the exams will be 450 points. These exams will consist of short answer type questions and numerical problems and will be closed book exams. These exams will be administered during the regular class meeting. The material to be covered in each exam will be posted on blackboard. No one will be allowed to take an exam late, please do not ask. . If an exam is missed or a student does poorly on an exam, the grade on the Mandatory Final will replace the lowest exam grade.

Final exam: The closed book comprehensive final examination will consist of all the material covered in the class and is mandatory. This final exam accounts for 150 points and will be administered during the final exam week.

Missed exams/quizzes: ***There will be no make- up exams or quizzes.*** A missed quiz or exam will be considered as the lowest one. The lowest two quizzes and the lowest exam will be dropped.

Attendance:

Regular attendance in the lecture is expected and encouraged, though not required. If you miss a class, you are responsible for the material covered during that class. A sign in sheet will be provided during each class for administrative purposes.

Lab Report: Each lab report is worth 20 points. You will be submitting a total of 13 lab reports during the semester.
Each lab report will be graded based on the completed data sheet, the calculations, answers to the post lab questions and your lab skills for that particular experiment. Your lab skills will be based on being prepared, following safety rules, following instructions, following the procedure clearly (including the instructions for proper waste disposal), equipment and chemical use, efficient use of time, attitude, proper return of materials, patience and lack of excessive dependence on others. Get the data sheet signed by the instructor before you leave the lab.
Lab reports are usually due **as soon as you walk into the lab the following week** (unless instructed otherwise). There will be a one point deduction for not submitting a lab report when you enter the lab. Late lab reports will not be allowed.

- No late lab reports will be accepted. Please send an email with your lab report **before class** if you know you won't be able to attend class the day it is due.

PreLab Quizzes: A 10 point will be available in blackboard. The quizzes will be available during one week. The deadline to take the quiz is 11:59 PM the day before you performed the experiment. The quizzes will be multiple choice questions and will cover the background information from the current experiment. ***No makeup quizzes will be given!*** Failing to take the quiz will result in a zero for the quiz. The two lowest quiz grades will be dropped.

- There are no make-up quizzes. The lowest two grades will be dropped.
- The quizzes are designed to be taken in 30 minutes, if you leave the quiz and go back, the time will still be running and once the 30 minutes have passed, you won't be able to access the quiz anymore.
- There will be only one chance to submit your answer, so please make sure that you are 100% sure before submitting it.
- There will not be backtracking for any of the quizzes. This means that you won't be able to go back to any question and change your answer once you have submitted it.

Grading scale:
450 points exams (3 total, 150 points each exam)
150 points Final exam
400 points blackboard quizzes (8 quizzes drop the lowest two grades, 6 total, 40 points each quiz)
120 points pre-lecture assignments (8 assignments drop the lowest two grades, 6 total, 20 points each prelecture)
220 points lab reports (13 reports, drop the lowest 2 grades, 11 total, 20 points each)
100 points prelab quizzes (12 quizzes, drop the lowest 2 grades, 10 total, 10 points each)
1440 points total

Points	Grade
1188 or more	A
Between 1056 and 1187	B
Between 924 and 1055	C
Between 792 and 923	D
791 or lower	F

There will be no formal 'curving' of the grades. However, I reserve the right to alter the above grade assignment to reflect student/ class achievement more accurately and fairly. Please remember that grades represent the accumulation of performance during the semester, not your potential as a person or a student. Grades are not negotiable. Once I hand back a graded quiz/exam, the student will have 2 business days to review for any errors in the grading process, passed those days the grade stands.

Extra Credit: Will be available for lecture

Academic Honesty:
Cheating in any form will not be tolerated. Any attempt to give or receive information (Cheating) on an Exam or Lab will result in an immediate zero for that work that cannot be dropped. This includes looking at another student's exam or having any type of notes on your desk or person during an exam. Providing information to another student during an exam or lab is also cheating and will result in both of you getting zeros. A second attempt at cheating will result in an automatic F for the course. Also, for any assignments you turn in, everyone must turn in their own assignment. Even if you work on a worksheet with other students, I still need separate worksheets from everyone.

Attendance: Regular lecture and lab attendance is required.

Graded work and discussion of your grades: Every effort will be made by the instructor to return any graded work by the next class meeting. If you have any question about your grade on a particular Exam/Quiz or any other question related to your grades, please discuss it with me in person (either during office hours or at a mutually decided convenient time). This is for your own privacy. You have 2 business days from the time that I return a particular graded Quiz/Exam to discuss any grading issues on that particular assignment. After that time, the grade will stay unchanged. Grades will be regularly posted on Blackboard. Please bring any clerical errors to my attention at the earliest. These clerical errors will be fixed at any time.

How to succeed in the course: Read the chapter that is being discussed ***before*** coming to class to help you better understand the material being covered in the lecture. Ask questions. To succeed in this course, you should work on the assignments and read/review the material on a regular basis. Once a chapter has been completed in class, go back and read the lecture notes and the text book. *The key is to review the material on a regular basis and practice a lot.* ***If you feel lost at any point in the course, please see me as soon as possible. I encourage you to stop by my office during office hours (or a mutually decided convenient time) or go to the help session. Do not wait until the last minute to get help.***

The time to be concerned about your grade is now and every day after today. Do NOT wait until the last week of the semester to start thinking about how you can improve in the course.

Testing Procedures: Your cell phone must be turned off (vibrate is not ok) before the exam begins. If your cell phone is visible or you are caught looking at your cell phone at any time during a test, it will be assumed that you are cheating. Your test will be taken away and you will get a zero. All bags, bulky jackets and papers must be placed either under the chair or in the front of the room before you begin the exam. Take out extra pens, tissues, and anything else you might need before beginning your exam. You will not be allowed to access your bag during the test. You may not leave the room once the exam has started. If you leave the room after the exam has started, it will be assumed that you have finished the exam and your exam will be taken away.
You must have your own calculator. The instructor reserves the right to clear the memory from your calculator. The instructor also reserves the right to assign you a seat or move your seat in the middle of an exam.
Laboratory:

Course Description:
This is the laboratory component of the first half in the two semester College chemistry series. We will be performing experiments that introduce you to various techniques in chemistry.
After having completed this course, the student should:

1. Know and be able to practice safe and generally accepted laboratory techniques
2. Understand the basic principles of the experiments performed and instruments used in the experiment.
3. Understand how to use and manipulate data in order to calculate results for the given experiments to the correct sig figs including error analysis.

Lab Safety: ***Splash resistant safety goggles must be worn at all times in the lab during wet labs.*** You will not be allowed to participate in lab if you do not have your goggles. These goggles can be purchased in the bookstore. Sandals or open-toes shoes are NOT allowed in the lab. Any student wearing sandals or open-toes shoes will be asked to leave the lab. (As a backup, I suggest that you keep your goggles and a pair of sneakers/tennis shoes in your car or your backpack). A violation will result in a zero for that experiment.

Required materials:
1) Splash-proof laboratory safety goggles
2) Proper shoes and clothes
3) Printed lab handout and rubric– You must print and bring the appropriate lab handout each week. You will lose 3 points for not having the handout with you. I do not have extra copies of the lab handout to give; you are responsible for printing them every week. Please don't wait until the last minute in case you run into printing issues. **You must bring to every lab meeting: your calculator, your safety goggles, pens/pencils/erasers and the printed lab handout and rubric!!**

Laboratory format:
There may be online Pre-Labs for every lab. The pre-labs will be available until 1 hour before the start of class on the day that we will be doing the experiment. We will meet in room AA489, we will go over the experiment that is to be performed on that day. Do not to miss this pre-lab lecture as you might be given special instructions/tips and told about some of the precautions regarding the experiment.

Attendance: Regular and punctual attendance is expected. The beginning of the pre-lab lecture is the cut off time for being late. Once I have started talking about the experiment, late students will not be allowed in. Missing a lab or being more than 10 minutes late will mean a score of zero for that experiment.

Make up policy: ***There will be no lab make ups. If you miss a lab for any reason (including lab missed due to safety violation), it will mean a score of zero for that missed lab.*** The lowest lab score will be dropped.

Academic Honesty: Cheating in any form will not be tolerated. Any attempt to give or receive information (Cheating) on a quiz or Lab report will result in a zero for that work that cannot be dropped. Even if the data was collected as a group, ***all the data analysis and calculations have to be done individually.*** If a lab report is copied, then both the copied work and the work that was copied will be given a zero that cannot be dropped. A second attempt at cheating will result in a zero for the lab part of the course.

Any student who thinks he/she may need an accommodation based on a disability should make an appointment to see a Counselor for Disability Services. You must provide a memorandum of accommodation which can be obtained from the Counselor for Disability Services, Room 193 Bisdorf building. Tel No: (703) 933- 1840

*The **Academic Center for Excellence** (ACE) and the **Academic Center for Reading and Writing** (ACRW) provide **free** peer tutoring and reading and writing assistance. **ACE and ACRW are located in AA229**. Tel No: 703.845.6363*
ACE Hours: Monday through Thursday: 8:30 a.m. – 6:00 p.m.; Friday 8:30 a.m. – 1:00 p.m.
ACRW Hours: Monday - Thursday: 9:00 a.m. - 6:00 p.m.; Friday: 9:00 a.m. - 1:00 p.m.

Topics to be covered: **(Chapter numbers correspond to the OpenStax textbook)**

Chapter 1: Essential Ideas

Scientific method, Matter and its classification, Physical and chemical changes and Physical and Chemical properties, Units of measurement, Significant figures, Accuracy versus precision, Conversion between units, sig figs in calculations

Chapter 2: Atoms, Molecules, and Ions

Laws leading to the modern atomic theory, subatomic particles (protons, neutrons and electrons) Structure of the atom, Elements and Atomic number, Isotopes, Ions (loss and gain of electrons), Atomic mass, Chemical bond, Molecular formulas, Naming Compounds and writing formulas (Ionic compounds, compounds with polyatomic ions, hydrated ionic compounds, Binary molecular compounds, Acids),

Chapter 3: Composition of Substances and Solutions

Molar mass, The Mole, Formula Mass and mole concept for compounds, Percent composition, Empirical and Molecular Formulas, Writing and Balancing Chemical Equations, Solution concentration (molarity) and dilution

Chapter 4: Stoichiometry of Chemical Reactions

Stoichiometry (mole-mole conversions and mole-grams conversions), Limiting reagent, Theoretical yield and percent yield, Types of solutions, solubility of ionic compounds, Precipitation reactions, Acid-Base reactions, and Gas evolution reactions (writing molecular, complete ionic and net-ionic equations for each of these reactions), oxidation numbers, redox reactions, combustion reactions, Solution stoichiometry

Chapter 6: Electronic Structure and Periodic Properties of Elements

Light and electromagnetic radiation, Electromagnetic spectrum, Photoelectric effect, particle nature of light (photon), Absorption versus emission spectrum, line and continuous spectrum, Bohr model and Spectroscopy, Solutions to the Schrodinger equation (The quantum numbers), Hydrogen atom spectrum, Atomic orbitals and their shapes, The modern periodic table, Electronic configuration of atoms and ions, Orbital diagrams, Electronic configuration and the periodic table, Core versus Valence electrons, Paramagnetism and diamagnetism, Periodic trends in atomic radius, ionic radius, ionization energy and Electron Affinity

Chapter 7: Chemical Bonding and Molecular Geometry

Types of chemical bonds, Electron dot structures, Octet rule, Lewis structures, Electronegativity and bond polarity, Resonance Lewis structures, Formal charges, Incomplete and expanded octets, Bond energy and bond length

Chapter 8: Advanced Theories of Covalent Bonding

The VSEPR theory (the five basic shapes for 2 – 6 electron groups), the effect of lone pairs, Electron geometry versus molecular geometry, Shapes of larger molecules with multiple central atoms, Molecular shape and polarity, Valence bond theory and hybridization (sp, sp^2, sp^3, sp^3d and sp^3d^2), sigma and pi bonds

Chapter 9: Gases

Pressure (its units and conversion between them), gas Laws (Boyle's, Charles', Avogadro's and Ideal gas law), Molar volume, Application of ideal gas law (Density and Molar mass of a gas), Mixture of gases (Dalton's law of partial pressures), Collecting gases over water, stoichiometry in reactions involving gases, Kinetic molecular theory (temperature, kinetic energy and molecular velocities), Diffusion and Effusion, Deviation from ideal behavior (under what conditions)

Chapter 5: Thermochemistry

Energy (definition and units), First law of thermodynamics (Internal energy and work), Heat and transfer of thermal energy, Specific heat capacity, heat capacity, molar heat capacity, Enthalpy (Exothermic and endothermic process), Stoichiometry and enthalpy change, Constant volume and constant pressure calorimetry, Standard Heats of reaction from standard heats of formation, Hess's Law,