**Lecture: CHEM 111.02**
**Recitation/Lab: CHEM 111.02A, CHEM 111.02B, CHEM 111.02C**
**Introductory Chemistry I**
**Spring 2022**

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**Instructor:** Dr. Maria V. Schiza, Ph.D.
**Office:** Caputo Hall 219
**Office Phone #:** 717-871-7437
**e-mail:** maria.schiza@millersville.edu (best way to be reached!)


**Meeting Times:**
**Lecture:** M W F 2:00-2:50 pm – **Brossman 102 – Dr. Schiza**
**Recitation/Lab:**
**Monday - Section C:**
Recitation: 5:00-5:50 pm – **Roddy 153 - Dr. Schiza** / Lab: 6:00-7:50 pm **- Caputo 328 - Dr. Bonser**
**Tuesday - Section A:**
Recitation: 9:00-9:50 am – **Roddy 211 - Dr. Schiza** / Lab: 10:00-11:50 am **- Caputo 328 - Dr. Bonser**
**Tuesday - Section B:**
Recitation: 2:10-3:00 pm – **Roddy 153 - Dr. Schiza** / Lab: 3:10-5:00 pm **- Caputo 328 - Dr. Bonser**

**Office Hours:**
**Office Hours: in person-Caputo 219**
**Mon: 10-11 am, Wed: 10-11 am & 3-4 pm, Fri: 10-12 pm**
Alternative times can be scheduled by appointment or virtually through Zoom.

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**Welcome to CHEM 111:**

I would like to welcome you all to CHEM 111 – Introductory Chemistry I! I am very excited to start this semester and meet and interact with you in-person. As you all know we are leaving in an unusual time and we should all try to do our best to protect our health and the health of others. Please follow the University guidelines regarding the pandemic and masking. If you have any symptoms related to the virus, please stay at home and notify your instructors as soon as possible. I will remain flexible and work with you to ensure optimal learning for successful completion of the course.

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**Required Course Materials:**

- **Textbook:** is available in web view (recommended) and PDF for **free** online at the following webpage: https://openstax.org/details/books/chemistry-2e
  You can also choose to purchase it on iBooks or get a print version via the campus bookstore or from OpenStax on Amazon.com. You can use whichever formats you want. Chemistry, 2e from OpenStax, Print ISBN 194717262X, Digital ISBN 1947172611
- **Online Homework/Quiz Code:** Chem101 Complete Activation F3395, Author: 101 Edu, Inc., ISBN: 978-1-7359195-2-2 **(look for step-by-step instructions for the Chem 101 Code purchase in D2L)**
- **Calculator:** Scientific calculator capable of performing logarithmic (log, ln) and exponential ($10^x$, $e^x$, $y^x$) functions.
- **Regular access to Desire to Learn/Brightspace (D2L):** https://millersville.desire2learn.com **and university email**

**Required Laboratory Materials:**

- **Safety Glasses/Goggles for the laboratory:** can be purchased in the bookstore or Caputo 330
- **Laboratory Notebook:** can be purchased in the bookstore (bound/quadrille based)

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**Course Description and Learning Objectives:**

CHEM111 is the first semester course of General Chemistry (followed by CHEM112) for students majoring in chemistry as well as biology, earth sciences and physics. Learning the material covered in CHEM111 provides students with a foundational understanding of scientific principles needed in future studies in any field of science. Students who successfully complete CHEM111 should have a fundamental understanding of chemical stoichiometry, atomic structure, ideal gas behavior, chemical energy, intermolecular forces, covalent and ionic bonding, and properties of liquids, solutions, and solids. **Chapters 1 through 11 are covered in CHEM111.**

**Learning Outcomes:** Upon the completion of CHEM 111 students should have an understanding of:

1. properties of atoms, molecules, and the various states of matter
2. the atomic structure and the periodicity of elements in the periodic table
3. the idea of a mole and the use of chemical stoichiometry
4. precipitation reactions, acid/base reactions, and redox reactions
5. the "gas laws" governing the physical/chemical behavior of gases
6. chemical reactions that involve energy flow
7. simple quantum mechanical treatments of atoms and molecules
8. current bonding models for simple inorganic and organic molecules in order to predict structures and important bonding parameters
9. how to predict molecular geometries of selected molecular species
10. properties of solids, liquids and solutions and intermolecular forces

## Tentative Lecture Schedule - CHEM 111 – Spring 2022:

| Chapter | Module | Assessment/Comment |
|---|---|---|
| Essential Ideas -Chapter 1 | Module 1: Properties of Matter | **Graded Online Homework**<br><br>**Graded Online Quizzes (every other week)**<br><br>**Graded Exam 1** (the exam date will be announced a week in advance - material examined from modules 1-6) |
| | Module 2: Measurements | |
| Atoms, Molecules, and Ions – Chapter 2 | Module 3: Atomic Theory | |
| | Module 4: Elements and Compounds | |
| Composition of Substances and Solutions – Chapter 3 | Module 5: The Mole | |
| | Module 6: Aqueous Solutions | |
| | | |
| Stoichiometry of Chemical Reactions – Chapter 4 | Module 7: Chemical Equations | **Graded Online Homework**<br><br>**Graded Online Quizzes (every other week)**<br><br>**Graded Exam 2** (the exam date will be announced a week in advance - material examined from modules 7-14) |
| | Module 8: Reaction Stoichiometry | |
| Gases – Chapter 9 | Module 9: Gas Laws | |
| | Module 10: Gas Stoichiometry | |
| | Module 11: The Kinetic- Molecular Theory | |
| Thermochemistry – Chapter 5 | Module 12: Introduction to Energy | |
| | Module 13: Calorimetry | |
| | Module 14: Enthalpy | |
| | | |

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|---|---|---|
| Electronic Structure and Periodic Properties of Elements – Chapter 6 | Module 15: Electromagnetic Energy / Bohr Model of the Atom | **Graded Online Homework**<br><br>**Graded Online Quizzes (every other week)**<br><br>**Graded Exam 3** (the exam date will be announced a week in advance - material examined from modules 15-21) |
| | Module 16: Quantum Theory | |
| | Module 17: Periodic Properties | |
| Chemical Bonding and Molecular Geometry – Chapter 7 | Module 18: Ionic and Covalent Bonding | |
| | Module 19: Lewis Structures | |
| | Module 20: Molecular Structure and Polarity | |
| Advanced Theories of Covalent Bonding – Chapter 8 | Module 21: Advanced Theories of Covalent Bonding | |
| | | |
| Liquids and Solids – Chapter 10 | Module 22: Intermolecular Forces | **Graded Online Homework**<br><br>**Graded Online Quizzes (every other week)** |
| | Module 23: Phase Changes | |
| | Module 24: The Solid State of Matter | |
| Solutions and Colloids - Chapter 11 | Module 25: Solubility | |
| | Module 26: Colligative Properties | |
| **CUMMULATIVE FINAL EXAM – All modules covered** | **Thursday, May 5th, 10:15-12:15 pm** | |

**LECTURE: (750 pts)**

***Graded ONLINE Homework:*** There will be ten (10) online homeworks based on material covered in class. Graded online homework will be assigned regularly through the CHEM 101 platform.

***Graded ONLINE Quizzes:*** There will be seven (7) online quizzes. Those will be based on previous covered material in lecture. Completing assigned homework/textbook practice problems/worksheets/handouts related to the lecture material is very helpful with mastering the material and performing well in quizzes and exams. The quizzes will be given on Fridays through the CHEM 101 platform, every other week. There will be no quiz the first week of classes or the last week of classes.

***Graded IN-CLASS Exams:*** There will be three (3) exams and one (1) cumulative final. Those will be based on covered material from the lecture as indicated by the modules. All exams will be given in person.

**RECITATION:**

Recitation sessions are dedicated to a) mastering the lecture material, b) problem solving.
Practice problems will be assigned from the textbook and additional worksheets/handouts which will be posted in D2L. Such problems will be discussed and solved during recitation.

**LAB: (250 pts)**

The lab is 250 pts of the course. All labs/experiments and all assignments need to be completed to pass the course. At least 60% of the points need to be earned in the lab in order for those points to be added to the overall course points. If you cannot attend a scheduled lab for reasons in the University-Approved Guidelines, please contact your instructor as soon as possible to arrange an alternate time.

**Total Points for the course = 750 + 250 = 1000 pts**

**Tentative Laboratory Schedule:**

**Monday Lab (111.02C)**

| | **Title – Experiment** | **Experiment #** |
|---|---|---|
| **Jan 24** | Safety In the Chemistry Lab & **Check-In** / Measurements and Density – Part II | Exp 1 |
| **Jan 31** | Formula and Composition of a Hydrate – Part A | Exp 2 |
| **Feb 7** | Identification of Common Chemicals | Exp 6 **(2 Weeks)** |
| **Feb 14** | Identification of Common Chemicals | Exp 6 |
| **Feb 21** | Titration of Acids and Bases - Part B | Exp 7 |
| **Feb 28** | Gravimetric and Volumetric Analysis - Part A & B | Exp 8 **(2 Weeks)** |
| **Mar 7** | **Spring Recess / No Lab** | |
| **Mar 14** | Gravimetric and Volumetric Analysis - Part C | Exp 8 |
| **Mar 21** | Evaluation of the Gas Law Constant | Exp 10 |
| **Mar 28** | Thermochemistry: Heat of Reactions | Exp 11 |
| **Apr 4** | Spectrophotometric Analysis of Aspirin – Part B | Exp 12 **(2 Weeks)** |
| **Apr 11** | Spectrophotometric Analysis of Aspirin – Part C | Exp 12 |
| **Apr 18** | **Lab Final - based on Experiment 6** | **Timed test/Check-out** |
| **Apr 25** | Molecular Models and Covalent Bonding / Theoretical Lab | Exp 13 |
| **May 2** | **No Lab** | |

**Tentative Laboratory Schedule:**

**Tuesday Labs (Sections 111.02 A and 111.02B)**

| | **Title – Experiment** | **Experiment #** |
|---|---|---|
| **Jan 18** | Safety In the Chemistry Lab & **Check-In** | Safety/Check-In |
| **Jan 25** | Measurements and Density – Part II | Exp 1 |
| **Feb 1** | Formula and Composition of a Hydrate – Part A | Exp 2 |
| **Feb 8** | Identification of Common Chemicals | Exp 6 **(2 Weeks)** |
| **Feb 15** | Identification of Common Chemicals | Exp 6 |
| **Feb 22** | Titration of Acids and Bases - Part B | Exp 7 |
| **Mar 1** | Gravimetric and Volumetric Analysis - Part A & B | Exp 8 **(2 Weeks)** |
| **Mar 8** | **Spring Recess / No Lab** | |
| **Mar 15** | Gravimetric and Volumetric Analysis - Part C | Exp 8 |
| **Mar 22** | Evaluation of the Gas Law Constant | Exp 10 |
| **Mar 29** | Thermochemistry: Heat of Reactions | Exp 11 |
| **Apr 5** | Spectrophotometric Analysis of Aspirin – Part B | Exp 12 **(2 Weeks)** |
| **Apr 12** | Spectrophotometric Analysis of Aspirin – Part C | Exp 12 |
| **Apr 19** | **Lab Final - based on Experiment 6** | **Timed test/Check-out** |
| **Apr 26** | Molecular Models and Covalent Bonding / Theoretical Lab | Exp 13 |

**COURSE POLICIES:**

***Class and Recitation Attendance:***

Students are expected to attend all lectures and recitations. Students are responsible for all material covered. It is the responsibility of the student to master the material covered. If you need to be excused for a valid reason, please **notify me in advance** in order to arrange the make-up of any missed work. In unexpected cases (illness, death in the family), contact me **as soon as possible** by e-mail or phone within the week of the absence. Any make-up quiz or exam conducted outside the schedule may differ in form or exact content from the regularly scheduled quiz or exam. Making up missed work is at the discretion of the instructor, as long as proper and validated excuse is presented. **A grade of 60% is required in lecture and recitation to pass the course.**

***Laboratory Attendance:***

Students **must attend lab every week**. Students **need to complete all laboratories assignments/lab reports. A grade of 60% in lab is required to pass the course**. Making up missed lab work is at the discretion of the instructor.

***Academic Honesty:***

Students are expected to conduct all CHEM111 work in an honest and ethical manner. Cheating on coursework bypasses the learning process and will **NOT** be tolerated. Anyone caught cheating will be assigned a score of zero on the work. **ALL work is individual.** Habitual academic dishonesty will be penalized to the maximum.

***Cooperative Environment:***

Students with any special concerns about CHEM111 are welcome to approach me about them. Together, we can address each particular situation. Resources available include the Office of Learning Services and Tutoring Center (Lyle Hall).

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**Grading**

**Lecture:**

| | | |
|---|---|---|
| Assigned Online Homework (15 points each) | 10 | 150 points |
| Online Quizzes (15 points each) | 7 | 105 points |
| In-Class Exams (100 points each) | 3 | 300 points |
| In-Class Final (195 points) | 1 | 195 points |
| | **Lecture subtotal** | **750 points** |

**Lab:**

**will be graded by the lab Instructor (Dr. Steven Bonser):**

| | |
|---|---|
| **Lab subtotal** | **250 points** |

**Total for the class: 750 + 250 = 1000 points**

***Note***

**A grade of 60% is required in lab to pass the course. A grade of 60% is required in lecture and recitation to pass the course.**

***Note***

**Class participation will be taken into consideration during final grading.**

***Note***

**To pass CHEM 111, you must have a passing grade in the lecture/recitation component (at least D-). Grade of C- or better is required to enroll in CHEM 112. (Grade of C or better is required to enroll in CHEM 112 for chemistry majors).**

**Grading Scale:**

| Grade | Percentage |
|---|---|
| A | 92-100 |
| A- | 90-91.9 |
| B+ | 88-89.9 |
| B | 82-87.9 |
| B- | 80-81.9 |
| C+ | 78-79.9 |
| C | 72-77.9 |
| C- | 70-71.9 |
| D+ | 68-69.9 |
| D | 62-67.9 |
| D- | 60-61.9 |
| F | < 60 |

**Available Tutoring:**

The tutoring options for the Spring 2022 semester are as follows:

1. **Chemistry Peer Learning Hours - available In-Person**:
   **Tuesdays** - Roddy 256 from 5 – 7 pm
   **Wednesdays** - Roddy 256 from 2 – 4 and 5 – 7 pm
   **Thursdays** - Roddy 256 from 2 – 4 and 5 – 7 pm
   You can attend any of these sessions at any time with no need to sign-up. Please think of these hours as a place to work on your chemistry where support is available and not just wait until you fall behind in a course.
2. **Individual and Small-Group tutoring could also be available.** You will be encouraged to try Peer Learning Hours first to see if it meets your needs and will be assigned individual or small group tutors if Peer Learning Hours does not meet your needs. This tutoring could be in-person or virtual. Please contact Dr. Dan Albert for further information: Daniel.albert@millersville.edu
3. **The University also has Smarthinking available for 24/7 online tutoring support** for 100-level chemistry courses and organic chemistry.
   https://wiki.millersville.edu/display/instructdocs/Smarthinking+Online+Tutoring
   OR access Smarthinking through D2L under the **University** menu and select **Smarthinking**.

***Title IX Statement***

*Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment, comply with Title IX of the Education Amendments of 1972, 20 U.S.C. §1681, et seq., and act in accordance with guidance from the Office for Civil Rights, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report to the person designated in the University Protection of Minors policy incidents of sexual violence or any abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is available at www.millersville.edu/titleix.*