**Overview:**
CHEM 192 – Introductory Chemistry introduces the quantitative and qualitative study of chemistry to students who intend to pursue a science major. CHEM 192 will prepare students for the majors-sequence course, CHEM 210 – General Chemistry 1. If you have questions about whether this is the right course for you, please see me.

**Prerequisite:**
The prerequisite for the course is completion of MATH 110 (Elementary Algebra) or the equivalent with a grade of C or better, or an appropriate math placement score.

**Student Learning Outcomes:**
*Upon completion of this course, the student will be able to:*
1. Communicate ideas and experimental results using chemical formulas, names, symbols, and equations, using the periodic table as reference.
2. Balance simple synthesis, decomposition, combustion, single replacement, and double replacement reactions.
3. Apply a variety of problem-solving techniques including algebraic manipulations, dimensional analysis, and stoichiometric calculations to quantitatively analyze chemical reactions.
4. Perform qualitative and quantitative chemistry reactions using common laboratory techniques and equipment to make qualitative and quantitative observations about physical and chemical properties.
Course Materials

Required:


- **Laboratory Textbook:** *Chemistry 192 Laboratory Manual – Skyline College – on the course website*

- **Laboratory Notebook:** Bound, numbered, dual-copy notebook

- **Sapling Learning Online Homework Access** (may be purchased online – see course website for link)

- **Scientific Calculator:** A scientific calculator is required. Devices with a full alpha-numeric (qwerty) keyboard, or wi-fi or cellular capability will NOT be allowed during quizzes, tests, or exams. Many graphing calculators are acceptable.

- **Laboratory Safety Glasses or Goggles**

- **Ruler / Straightedge**

Highly Recommended:

- **Student Solutions Manual** to accompany *Introductory Chemistry: A Foundation, 7th or 8th Edition* (should match the edition of the text you purchase)

- **Three-ring binder** for course notes/handouts/exams/quizzes/etc.

Course Calendar – Important Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>August 17</td>
<td>First day of classes</td>
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<tr>
<td>September 5</td>
<td>Labor Day – No classes</td>
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<tr>
<td>September 5</td>
<td>Last day to DROP the course (with no record on transcript)</td>
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<tr>
<td>September 9</td>
<td>EXAM #1</td>
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<tr>
<td>October 5</td>
<td>EXAM #2</td>
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<tr>
<td>October 12</td>
<td>Flex Day – No classes</td>
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<tr>
<td>October 28</td>
<td>EXAM #3</td>
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<tr>
<td>November 11</td>
<td>Veteran’s Day – No classes</td>
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<tr>
<td>November 16</td>
<td>Last day to WITHDRAW from the course (grade = W)</td>
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<tr>
<td>November 23</td>
<td>EXAM #4</td>
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<tr>
<td>November 24-25</td>
<td>Thanksgiving Recess – No classes</td>
</tr>
<tr>
<td>December 12</td>
<td>FINAL EXAM (11:10 am – 1:40 pm)</td>
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</tbody>
</table>

Note: The above schedule is subject to change.

Lecture & Laboratory Calendar

The lecture and laboratory calendar will be maintained on the course website. Please see the website for the specific experiments that will be performed, topics for lecture, discussion sessions in lab, some due dates, and other course activities. Dates and times are subject to change. *Check the calendar frequently for updates.*

http://accounts.smccd.edu/batesa/chem192
## Course Lecture & Laboratory Outlines

<table>
<thead>
<tr>
<th>Lecture Topics</th>
<th>Chapter(s)</th>
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<tbody>
<tr>
<td>Introduction to Chemistry &amp; the Study of Matter</td>
<td>1 &amp; 3</td>
</tr>
<tr>
<td>Mathematics in Chemistry: Chemical Measurements &amp; Calculations</td>
<td>2</td>
</tr>
<tr>
<td>Chemical Foundations: Elements, Atoms, Ions, and the Periodic Table</td>
<td>4</td>
</tr>
<tr>
<td>Chemical Formulas &amp; Nomenclature</td>
<td>5</td>
</tr>
<tr>
<td>The Mole and Chemical Composition</td>
<td>8</td>
</tr>
<tr>
<td>Chemical Reactions</td>
<td>6 &amp; 7</td>
</tr>
<tr>
<td>Stoichiometry and Chemical Quantities</td>
<td>9</td>
</tr>
<tr>
<td>Solutions</td>
<td>15</td>
</tr>
<tr>
<td>Acids &amp; Bases</td>
<td>16</td>
</tr>
<tr>
<td>Introduction to Modern Atomic Theory &amp; Chemical Bonding</td>
<td>11 &amp; 12</td>
</tr>
<tr>
<td>Introduction to Gas Laws</td>
<td>13</td>
</tr>
</tbody>
</table>

## Laboratory Experiments & Activities

<table>
<thead>
<tr>
<th>SAFETY &amp; Check-in</th>
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</thead>
<tbody>
<tr>
<td>Experiment 1: Reaction in a Bag</td>
</tr>
<tr>
<td>Experiment 2: Density of Solids &amp; Liquids</td>
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<tr>
<td>Experiment 3: Separation of Salt &amp; Sand</td>
</tr>
<tr>
<td>Experiment 4: Paper Chromatography</td>
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<td>Experiment 5: Empirical Formula of a Compound</td>
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<td>Experiment 6: Determining the Waters of Hydration in a Hydrates</td>
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<tr>
<td>Experiment 7: Types of Chemical Reactions</td>
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<tr>
<td>Experiment 8: Engineering Project: Construction &amp; Flight of a Hot Air Balloon</td>
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<tr>
<td>Experiment 9: Electron Dot Structures</td>
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<tr>
<td>Experiment 10: Molecular Modeling</td>
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<tr>
<td>Experiment 11: Acid-Base Titration: Standardization of a Sodium Hydroxide Solution</td>
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<tr>
<td>Experiment 12: Acid-Base Titration: Determination of the Concentration of Commercial Vinegar</td>
</tr>
</tbody>
</table>

Other experiments & lab activities as announced

**Note:** The above outlines are subject to change.
Course Information, Requirements, Policies, and Assistance

Lecture
The lecture component of the course will present the fundamental concepts of chemistry, problem solving techniques, and sample problems. Outlines of lecture notes will be provided on the course website or provided in class. These are intended to facilitate note-taking during lecture – they are not a substitute for attending lecture. Problems stated in the notes outlines will be solved in lecture. Many examples, demonstrations, and additional explanations will be presented in lecture. The lecture topics listed above closely follow the order of presentation in your book. However, course notes and emphasis may at times vary significantly from the text. Your attendance at lecture is essential to successful performance in the class.

Laboratory Experiments & Activities
The laboratory component is a major and essential part of this course. Attendance in lab is REQUIRED. Laboratory work is intended to familiarize you with basic laboratory techniques, encourage exploration of the process of scientific inquiry, and illustrate concepts of chemistry. Written reports will be required for some exercises. Pre-lab assignments must be completed to begin a laboratory experiment.

Discussion / Problem-Solving Sessions
Many laboratory sessions will include time for organized discussion of lecture topics and problem sets. These discussions are a required part of the course. Group problem-solving and active discussion will be encouraged.

Course Website
Problem sets, lecture notes outlines, important course announcements, updated schedules, and links to useful resources will be posted on the website. You are required to check the site regularly. Some announcements may be posted only on the website. If you miss a class section, you are responsible to check the web site for announcement of quiz dates or any schedule or due date changes.

Lecture Textbook Readings and Problem Assignments
Reading assignments and problems assigned from the text are designed to help you learn background material, give a thorough explanation of course topics, and provide extra practice and review of course topics presented in lecture and lab.

Problem Sets, Extra Practice & Discussion Worksheets and Lab Manual Study Assignment
Problem sets and worksheets will be an essential means of preparation for the course. The course focuses on problem solving. Successful completion of the problem sets is key to successful exam performance. Problem sets will be assigned regularly. Extra Practice & Discussion Worksheets will be provided in class and posted on the website. The lab manual also includes study assignments and additional practice worksheets. Some will be used to drive discussion and study sessions in lab. Others are recommended for you to complete outside of class individually and in study groups.

Exams
Five exams and a comprehensive final exam will be given in the course. Exams will cover both lecture and lab material. No make-up exams or tests (lecture, lab, or final) will be given.
Quizzes

Quizzes may be given in the course and may or may not be announced. No make-up quizzes (lecture or lab) will be given.

Campus and Community Lectures / Expanding Your Horizons

Part of your academic development includes attendance and participation in lectures, seminars, workshops, and conferences of interest to you. In the near future, these are activities that you will likely find yourself seeking out to help broaden your experience and learn about new opportunities. Attendance at some out-of-class events may be required for the course, or bonus credit may be offered. Additional information will be provided in class. Even if not attending for credit, I recommend taking advantage of these opportunities!

Office Hours

Regular office hours will be kept up-to-date on the course website. Office hours are a time to get one-on-one and small group assistance from the instructors and other students who may be attending. Take advantage of this opportunity for individualized assistance. Office hours are also available by appointment. Please ask if you need help and cannot make it to the regular office hours and we will try to arrange a time.

Tutoring

MESA program. Tutoring and/or problem-solving workshops for CHEM 192 will be available through the MESA program. All students in CHEM 192 are welcome and encouraged to use the resources available through the program, located in room 7-309 (just down the hall from the third floor elevator of building 7). Computers, tutoring for other courses, scholarship programs, and other services are also available. Please visit their website for more information (a link is available on my website).

The Learning Center. Tutors for CHEM 192 will also be available in the Learning Center in Building 5 – Ground Floor. Please visit their website for more information (a link is available on my website).

Study Groups

Working with other students to complete and understand problem sets is essential to the course. You will be asked to make study groups during lab/discussion time. I recommend forming study groups to work outside of class time as well. Success in major’s courses in science and math is increased by active study and discussion with classmates.

Special Needs

If you have any special needs for accessibility or any other issues – for the lab or lecture, please discuss with me so that appropriate accommodations may be made.

Dropping or Withdrawing from the Course

If you choose to DROP or WITHDRAW from the course, it is your responsibility to follow the appropriate procedures and observe the ending dates for these options. I will not initiate a drop except under circumstances outlined in the lab section of the syllabus.
Grading

**APPROXIMATE point breakdown:**

- Exams (lecture/lab): 600 points
- Tentative Quizzes (lecture/lab): 50 points
- Problem Sets / Worksheets: 75 points
- Lab Reports/Exercises: 200 points
  
  **925 points**

**Grading scale:**

- A = 90.0 % – 100 %
- B = 80.0 % – 89.9 %
- C = 70.0 % – 79.9 %
- D = 60.0 % – 69.9 %
- F = 0 % – 59.9 %

See the important notes below!

**IMPORTANT additional information on grading: READ CAREFULLY!**

- The above point and grading breakdowns are estimates only and are subject to change.
- If you fail to complete more than 2 laboratory exercises (experiment or activity), you will NOT earn a passing grade (C or better) in the course, regardless of your class percentages.
  - Completion of an experiment or activity requires participation in the lab sessions in which the experiment is performed and submission of a complete lab report (or other required assignment) for that experiment or activity.

**Make-Up & Late Work**

Exams, quizzes, problem sets, worksheets, and most lab exercises may not be made-up.

Problem sets and pre-labs will **not** be accepted for late credit. (Please also see notes about pre-lab requirements under the Laboratory Requirements and Guidelines.)

**Limited LAB Make-up:** If an **unavoidable** conflict exists with a lab period, attendance at a different lab section may be arranged **in advance**, permitting space and materials are available. You must get the approval of your own lab instructor and the instructor for the section in which you wish to make up the lab. It may not be possible to make up the lab. You will be allowed to make-up a lab by switching sections **only once**, and only at the discretion of the instructor and/or laboratory supervisor. Keep in touch with your lab instructor if an emergency or problem arises – use email for the easiest contact, or if not possible, leave a voicemail message with Professor Bates.

**Late Lab Reports:**

- Same day (anytime after the start of class) – **3pm of the next day**: 20 % deduction
- After noon of the day following the due date and **up to one full calendar week from the original time due**: 40 % deduction
- After one week from the original time due: **Not accepted for credit**
Personal Conduct – Expectations

GENERAL:

• All students are expected to RESPECT themselves, one another, the instructor, the room, and the equipment. In turn, the instructors will respect students and their academic needs and progress.

• REGULAR ATTENDANCE to lecture & laboratory is required. Please be ON TIME to lecture and lab as a courtesy to the instructor and other students. Time lost due to tardiness to lab, or exams cannot be made up. I will make every effort to start and end class on time. Please also make every effort to arrive and be prepared for class to start at the scheduled time.

• SAFETY: All students are expected to abide by the safety rules in the laboratory. These will be discussed in detail in a separate handout. Note that safety glasses or goggles are required at all times in the laboratory.

• Please SILENCE mobile phones and pagers before entering the lab or classroom. Please do not talk on the phone or check or send voice or text messages during class.

ACADEMIC INTEGRITY:

• Each student is expected to turn in only his or her own work, prepared for this course during the current semester (this applies to problem sets, prelabs, reports, and all assignments in the course).

• Each student is expected to do her or his own work on quizzes, tests, and exams without assistance from other students or any unauthorized aids (e.g. cheat sheets, calculator programs, etc.).

• Each student is expected to acquire his or her own laboratory data and report that data without alteration.

• Cheating, plagiarism, or academic dishonesty of any kind will not be tolerated in this course.

• Academic dishonesty will have serious consequences. The FIRST offense (and any subsequent offense) may result in any or all of the following:
  ▪ Receive a zero on the item in question.
  ▪ Lowering of the course grade (in addition to the above penalty).
  ▪ Course failure.
  ▪ Report to the Dean of Enrollment Services (maintains a record of all incidents of cheating).

• Under the standards of Academic Sanctions, you may be subject to any or all of the following on the FIRST offense (and any subsequent offense):
  ▪ A warning
  ▪ Temporary exclusion from an activity or class
  ▪ Censure
  ▪ Disciplinary Probation
  ▪ Suspension
  ▪ Expulsion

• Please see the Student Handbook (link available on the course website) or Course Catalog for the college’s definitions and policies on academic dishonesty and its consequences.

• Additional discussion of academic integrity may take place in lecture or lab.

• If you have questions regarding academic integrity, please ask the instructor(s).

• I would like to emphasize that I do NOT expect cheating to be a problem in the course. I expect that students will act with honesty and integrity in all of their work for the course.
Laboratory Requirements and Guidelines

Safety & Accessibility

- You MUST observe all safety rules at all times.
- Safety glasses or goggles MUST be worn in the lab at all times. You will be asked to leave the laboratory if you fail to keep them on. That lab session may NOT be made up.
- Conduct yourself SAFELY in lab! You may be asked to leave a lab session at the instructor’s discretion for failure to follow safety rules. That lab session may NOT be made up.
- Wear appropriate attire for lab work. You will not be allowed to work in the lab if you have open shoes, short pants or skirts, or other inappropriate attire. That lab session may NOT be made up.
- A full safety discussion, including a separate handout and a safety video will be presented in lab. Attendance for the discussion and video is required to begin participation in lab. To demonstrate your understanding of the safety rules, a safety quiz must be also be passed before you will be allowed to work in lab.
- If you have any special needs for accessibility or any other issues, please discuss with the lab instructor so that appropriate accommodations may be made.

Assignments, Reports, & Quizzes

- Pre-lab assignments must be completed before you may carry out a laboratory experiment and are due at the start of the lab session.
  - You will NOT be allowed to perform the lab if you have not completed it. That lab session may NOT be made up. If you perform the experiment without turning in the prelab, you will receive no credit for the lab activity or lab report.
  - If your prelab is incomplete, arrive at lab on time and inform the instructor. You may still be allowed to take quizzes or participate in activities not related to the experiment.
- All assignments (prelabs, lab reports, problem sets, etc.) are due at the START of the lab period on the due date. Assignments turned in late will receive no credit or reduced credit.
- Quizzes given in lab sections must be taken during the lab period you are registered to attend.

Attendance, Make-up, and Enrollment

- Attendance at the lab section is REQUIRED. Discussions, lab lectures, and other activities held during laboratory sessions are a REQUIRED element of the course. You may not be allowed to perform an experiment if you miss important safety information presented in lab lecture. That experiment may NOT be made up.
- Late arrival to a lab session may prevent you from working during that experiment, as you may miss important demonstrations and safety instructions. That experiment may NOT be made up.
- Due to the size of the lab and the high enrollment, laboratory make-up is LIMITED and reserved for cases with extreme circumstances. (Please see make-up section earlier in the syllabus for detailed instructions.)
- Attendance at the lab section is REQUIRED. An instructor-initiated drop may be considered for multiple LAB absences as outlined in the student handbook. Additionally, an instructor-initiated drop may be considered for LAB absences at the beginning of the semester to make room for students wishing to add. However, do NOT assume you are dropped if you stop attending. You must follow the appropriate withdrawal procedures and dates to avoid receiving a failing grade for the course.
- You must check out of your lab drawer within two weeks of dropping or withdrawing from the course. Once you are assigned a locker, you must checkout, even if you do no labs. You may check out by arrangement with the lab instructor or stockroom manager. If you remain registered for the course, you must checkout on the checkout date. If you do not properly checkout of your drawer, the stockroom will charge you a $25 checkout fee.