Semester and year: Spring, 2016  
Course Number: CHM-102  
Meeting Times and Locations:  

Instructor:  
Office Location:  
Phone:  
Office Hours: Paramus:  
Email Address:  

COURSE DESCRIPTION:  
CHM–102 Chemistry in Context is a student-centered approach for non-science majors to learn fundamental chemistry and its linkage to consumer issues, public policy, business and international affairs. Core topics include chemistry terminology, formulas, reactions, scientific measurements, shapes of molecules, chemical toxicity, green chemistry, consumer chemistry and energy sources. Laboratory activities emphasize fundamental concepts and measurements. Use of scientific and governmental websites, papers, poster presentations and discussion groups draw on students’ major fields of study.  

CREDITS/HOURS: 3 hr lecture, 3 hr lab, 4 credits  

PREREQUISITES: MAT-011 or equivalent by placement as a result of a basic skills placement test  

GENERAL ED COURSE: Yes  

STUDENT LEARNING OBJECTIVES: As a result of meeting the requirements in this course, students will be able to:  

1. Define and explain basic technical terms used in chemistry.  
2. Write names and formulas for simple compounds.  
3. Identify and name important acids and bases.  
4. Use scientific metric units correctly.  
5. Use conversion factors to solve problems.  
6. Apply basic gas laws.  
7. Write a balanced chemical equation.  
8. Solve simple stoichiometry problems.  
9. Interpret the enthalpy changes of chemical processes.  
10. Explain the wave nature and particle nature of light.  
11. Explain the reasons for the changes in the ozone layer and health consequences.  
12. Identify the causes of indoor and outdoor air pollution, greenhouse gasses, ground and water pollution and resulting health consequences.
13. Discuss the pro’s and con’s of efforts to solve local and global pollution, nutrition, and medicine issues and the consequences on economies, living standards and societies.
14. Explain the pro’s and con’s of Green Chemistry using guided and independently researched data.
15. Access government (e.g. EPA, NASA, NOAH) and scientific websites, download scientific data and present data in tabular and/or chart form in a short written or poster report and an oral (15 to 20 min) presentation.
16. Apply the scientific method and increase critical thinking skills.

**ASSESSMENT MEASURES:**
The student learning objectives will be assessed by:
1. Graded homework problems assigned from the text;
2. Written assignments, short papers and quizzes;
3. Laboratory experiments and exercises;
4. Website searches for scientific data;
5. Oral/poster presentation on a specific scientific topic;
6. Written examinations and an optional comprehensive final examination.

**BOOKS:**  


**COURSE CONTENT:**
Text Book Chapters 1 to 6 are the core chapters.

Chapter 1:  **The Air We Breathe**

Chapter 2: **Protecting the Ozone Layer**

Chapter 3: **The Chemistry of Global Climate Change**

Chapter 4: **Energy from Combustion**
Chapter 5:  Water for Life
Water: Molecular Structure, physical properties and hydrogen bonding.
Solvent properties.  Ions and Solutions.  Covalent compounds and solutions.
Federal water legislation and water purity.  Case Studies.

Chapter 6:  Neutralizing the Threat of Acid Rain and Ocean Acidification
coal and acid rain.  Combustion of gasoline and the acid environment.  Cost and
Control Strategies.  The Politics of Acid Rain.

The instructor will choose 2 to 3 additional chapters from the following.

Chapter 7:  The Fires of Nuclear Fission
Nuclear Energy.  Alpha, beta and gamma radiation.  Environmental and health
hazards; nuclear waste.  Risks and benefits.

Chapter 8:  Energy from Electron Transfer
Oxidation and reduction reactions – electron transfer, Voltaic cells and batteries.
Alternative Energy.

Chapter 9:  The World of Polymers and Plastics
Polymers, source of monomers.  Plastics – the big six.  Density.  Dealing with
plastics; recycling and reusing.

Chapter 10:  Manipulating Molecules and Designing Drugs
Drugs.  Extraction and herbal medicines.

Chapter 11:  Nutrition: Food for Thought
Carbohydrates, Fats, Proteins.  Structures of sugars, triglycerides and amino
acids.  Saturated and unsaturated fats.  Energy from Food.  Vitamins and
minerals – the other essentials.  Where cholesterol fits in.  Food Preservation.
Feeding A Hungry World.

Chapter 12:  Genetic Engineering and the Molecules of Life
Double Helix.  Protein Structure and Shape.  Recombinant DNA.  Vaccines.
Diagnosis through DNA.  Genetic Fingerprinting.  Cloning.

Supplementary Reading Material:

Other Requirements:
A scientific calculator is required.
**General Grading Policy:**

A. Unit Examinations (a minimum of 3), Final Exam and Quizzes 50 %
B. Papers, homework, Oral Presentations and Discussion Groups 25 %
C. Laboratory Work 25 %
D. Additional policies:
   1. Late work is not accepted.
   2. Any examination not taken will receive a grade of zero. Make-up examinations will be administered in accordance with the instructor's policy.
   3. Any student caught cheating (including using unauthorized formula sheets of any kind) will receive a grade of zero on that particular exam/test. That zero cannot be replaced by any other grade. Please read The Bergen Community College Statement on academic integrity as found in the college catalog and BCC Student Handbook.
   4. At the end of the semester, the grade on the final examination may be substituted for the lowest unit grade for the purpose of calculating the course grade provided that the final examination grade is higher than the lowest examination grade. At the discretion of the instructor, this policy may be somewhat modified.
   5. Exams will include a writing component in the form of a short essay or paragraph.

**Instructor’s Grading Policy:**
Will be provided separately by the individual instructor

**Attendance/Lateness Policy:**
All students are expected to attend punctually every scheduled meeting of each course in which they are registered. Attendance and lateness policies and sanctions are to be determined by the instructor for each section of each course. These will be established in writing on the individual course outline. Attendance will be kept by the instructor for administrative and counseling purposes.

**Other Policies:**

**Electronic Devices:**
The use of portable electronic devices such as pagers and cell phones is not permitted while class is in session. Please silence these devices before entering class.

The use of cell/smart phone calculators is not permitted.

**Code of Student Conduct:**
Students are encouraged to read, understand and follow the rules and standards of conduct as explained in the BCC Student Handbook. The Student Handbook is available in the Office of Student Life and on the BCC website.

**Student and Faculty Support Services:**
Students experiencing difficulty with the arithmetic or problem solving aspects of this course should acquaint themselves with the services of the Tutoring Center.

The BCC Library provides extensive support services for student research.

Faculty office hours may be a productive vehicle for assistance in understanding the course material.
Services for Students with Disabilities:
A wide variety of services are available to students with documented disabilities through the Office of Specialized Services (OSS). For further information, go to the OSS website: www.bergen.edu/oss or go to Room L-115.

FACULTY ABSENCE PROCEDURE:
A daily listing of cancelled classes will appear in a glass case near the registration area in the corridor on the first floor. Another such listing will appear in a glass case in Ender Hall. Students can consult these cases before going to class.
Cancelled classes are also listed under class cancellations at bottom of the BCC website page.

Under no circumstances are notices regarding class cancellations taped to classroom doors.

If students find a class cancelled which has not been listed, they should report this to the Divisional Dean’s Office, A-325 or the Evening Office C-107.

All BCC students enrolled in credit courses are entitled to a WebAdvisor account. With WebAdvisor, you may register online, pay your bill, check your schedule, room assignments, GPA, and find out what courses you need to take. To find out more about WebAdvisor or to sign up online, visit <http://go.bergen.edu>! While there, please make sure you give us your preferred email address. You'll find directions how to do this at <http://go.bergen.edu/email>.

CHM102CIC.SCOSStudentsp2016
# CHM–102 Chemistry in Context Laboratory Schedule


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<td>Check in; Safety; Instructor should distribute and discuss Divisional</td>
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<td>Safety rules for the Chemistry Laboratory. Teach Basic Laboratory</td>
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<td>Techniques and explain Oral presentation/Poster Sessions</td>
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<td>2</td>
<td>Experiment 1: Preparation and Properties of Gases in Air</td>
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<td>Experiment 4: Graphing Exercises. Computer Exercises: Good Ozone (up</td>
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<td>there); Bad Ozone (down here)</td>
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<td>Experiment 6: Color and Light</td>
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<td>Experiment 8: Molecular Models, Bonds and Shapes.</td>
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<td>Chemical Reactions: Handout</td>
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<td>Experiment 10: Verifying Molar Ratios in Chemical Reactions</td>
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<td>Experiment 12: Comparing the Energy Content of Fuels</td>
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<td>Conductivity: Electrolytes and Ions: Handout and/or</td>
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<td>Experiment 16: Measuring water hardness</td>
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<td>Acidity and pH (Handout) and</td>
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<td>Experiment 15: Analysis of Vinegar</td>
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<td>9</td>
<td>Experiment 20: Characterizing Acidic and Basic Materials</td>
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<td>Start Oral Reports/ Poster Session</td>
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<td>10</td>
<td>Oral Reports; Computer Exercise: Acid Rain</td>
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<td>Experiment 21: Acid Rain</td>
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<td>Experiment 22: Investigating Solubility</td>
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<td>Experiment 24: Exploring Electrochemistry</td>
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<td>Experiment 28: Synthesizing Aspirin</td>
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<td>Experiment 31: Measuring the Sugar Content in Beverages</td>
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<tr>
<td>15</td>
<td>Check Out/Student Assessment of Learning Gains</td>
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