COURSE OBJECTIVES

Instructor: Dr. Sunita Thyagarajan
Office: NCB 214
Phone: (410) 516-7864
Email: sunita@jhu.edu

Lecture: Monday, Wednesday, Friday 10:00 – 10:50 a.m., Remsen 1

Office Hours: Tuesday, and Friday 2:00 – 3:00 p.m. or by appointment in NCB 214
TA Help Sessions: Sunday – Thursday: 7:15 – 8:00 p.m. in Remsen 140

General Course Description
The course includes concepts of atomic structure, the periodic system, chemical bonding, nomenclature, stoichiometry, weight relationships, gases, liquids and solids, solutions, chemical reactions, thermodynamics and equilibrium, and acids and bases.

Course Materials
Books: Chemical Principles: The Quest for Insight by Atkins, Jones and Laverman (customized 6th Edition) - Available in the Bookstore. Note: Earlier or later editions are also acceptable texts. It is up to the student to find the relevant sections if using the alternate editions.

Optional: Study Guide and Solution Manual

CPS Units: Clickers (required)

Homework Assignments: Sapling Learning (required). The link should be available on Blackboard under Course Content.

Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hourly Tests (3)</td>
<td>(50%)</td>
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<tr>
<td>Final Exam</td>
<td>(25%)</td>
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<tr>
<td>Homework</td>
<td>(20%)</td>
</tr>
<tr>
<td>Clickers</td>
<td>(5%)</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
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Curve: If your final exam score (all scores converted to percentage) is higher than your lowest midterm then your lowest midterm will be replaced with the weighted average of the lowest midterm and the final. If the final exam score is lower, your midterm scores will remain unaffected. The Final Grade for this course will be assigned based on
your grand total as follows:
A = 92.0 - 100 %   A− = 88.0 – 91.9 %  B+ = 84.0 – 87.9 % and so on...
D = 60.0 – 63.9%   F = <60%

Exam schedule: September 30, October 21 and November 18th

Final exam: Friday, December 13 2019 from 2 – 5 p.m.

Guidelines
1. Makeup tests will not be given for individual midterm exams. If you miss an exam, you will need to provide credible documentation to support your absence from the exam. At the end of the semester, you will be allowed to take the cumulative make-up exam which will used to replace your missed exam. If you miss more than one exam, you will be given zeroes on the subsequent exams that you will miss.

2. Sunday, October 13, 2019: Last day to drop a class (for undergraduates)
3. Friday November 15, 2019: Last day for course withdrawal
4. Friday, December 6, 2019: Last day of classes

E-mail and Blackboard
Student e-mail (JHEDID@jh.edu) is an official means of communication for the University. It is expected that you check your student e-mail regularly and frequently, as you are responsible for information and announcements that will be sent to you. For this class, student e-mail will be used only for situations where timing is essential. All necessary information will be communicated in class and via Blackboard and all assignments will be on the corresponding Sapling course page. You will have 4 days to complete homework assignments once they are issued.

Classroom Policies
Attendance: You are expected to attend all classes and you will need to use your clicker as part of the lecture. Classroom participation in encouraged.

Academic Honesty: You are expected to be honest when taking any test. Dishonesty in the classroom, such as copying someone else’s results or using notes or a phone during testing, may result in a zero grade.

Classroom Conduct: You are expected to behave appropriately in an academic setting. Any use of inappropriate language in the classroom will be grounds for disciplinary action. More information on the JHU code of conduct can be found at: http://advanced.jhu.edu/wp-content/uploads/2013/01/AAP1101_CodeofConduct.pdf
Support Services and Help sessions
There are various help sessions available to help you with this course:

A) **TA help sessions**: These are held from Sunday through Thursday from 7:15 p.m. to 8:00 p.m. in Remsen 140. Teaching Assistants are available to help you with lecture, homework and related questions.

B) **Your head TA for this course is Philip To.** Any questions and/or concerns regarding the TA help sessions may be directed to him. **His email address is:** pto1@jhu.edu

C) **PILOT sessions**: These sessions are held every week and include problem sets (that match the lecture material), which the PILOT leader will assign. You are expected to work on these problems on your own and while answers are not released, you will be assisted and guided through the problem solving process. More information can be found here: [http://academicsupport.jhu.edu/pilot-learning](http://academicsupport.jhu.edu/pilot-learning)

D) **Problem Solving sessions**: This zero credit course is for general chemistry students who have had moderate or limited exposure to the subject. Special emphasis is placed on scientific problem-solving skills. There are two discussion sections per week, including one devoted exclusively to interactive quantitative problem solving. Please note that there are limited spots for these and it works on a first-come-first-serve basis.

E) **Learning Den tutoring**: The Learning Den provides course specific tutoring on a one-on-one basis. More information can be found at: [http://academicsupport.jhu.edu/learning-den-tutoring](http://academicsupport.jhu.edu/learning-den-tutoring)

**Disability Services**: Any student who may need an accommodation due to a disability, please make an appointment to see me during my office hour. In order to receive accommodations, a letter from Disability Services will be needed. More information on student disabilities can be found at: [http://web.jhu.edu/disabilities](http://web.jhu.edu/disabilities)

**Cancellation of Classes**: Class cancellation due to inclement weather will be posted by the University at: [http://esgwebproxy.johnshopkins.edu/notice/](http://esgwebproxy.johnshopkins.edu/notice/)
### OUTCOMES:

<table>
<thead>
<tr>
<th>Topics</th>
<th>Objectives - The student will be able to:</th>
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</table>
| **1. Chemical Theory**| 1. Distinguish between chemical and physical properties and changes  
2. Describe the major components of the atom and their locations within the atom  
3. Explain why Dalton’s Atomic Theory is the basis for modern chemistry  
4. Use the Periodic Table to locate the various elements and predict their properties  
5. Write symbols for isotopes and calculate the average atomic mass of an element  
6. Use gas laws or the Kinetic Molecular Theory to explain qualitative behavior of gases  
7. Predict direction of change in chemical reactions and calculate equilibrium concentrations  
8. Predict the types of intermolecular forces acting in a compound  
9. Describe the geometry and polarity of molecules and predict their physical properties  
10. Determine acid and base properties and calculate pH of a solution                                                                                                                                 |
| **2. Nomenclature**   | Name and write symbols for elements, ions, and compounds                                                                                                                                                                                    |
| **3. Equations**      | Write balanced molecular ionic and net ionic equations                                                                                                                                                                                     |
| **4. Calculations**   | 1. Interconvert moles, molecular weight and mass of substances  
2. Use conversion factors in calculations involving solids, liquids, gases, solutions, and heat  
3. Do stoichiometry calculations successfully  
4. Use gas laws and the Kinetic Molecular Theory to explain quantitative behavior of gases  
5. Calculate and express solution concentration in various ways such as mass percent, mole fraction and molarity  
6. Calculate the magnitude and direction of heat flow for physical and chemical changes  
7. Determine pH and pKa of solutions of weak and strong acids and bases                                                                                                                                 |
Schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Chapter</th>
<th>Class and Exam dates</th>
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<tbody>
<tr>
<td>1</td>
<td>Fundamentals</td>
<td>Aug. 29, 30</td>
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<tr>
<td>2</td>
<td>Fundamentals</td>
<td>Sep. 04, 06</td>
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<tr>
<td>3</td>
<td>Fundamentals</td>
<td>Sep. 9, 11, 13</td>
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<td>4</td>
<td>3</td>
<td>Sep. 16, 18, 20</td>
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<td>5</td>
<td>3/5</td>
<td>Sep. 23, 25, 27</td>
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<tr>
<td>6</td>
<td>5</td>
<td>Exam 1 – Sep. 30&lt;br&gt;Oct. 2, 4</td>
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<td>7</td>
<td>8</td>
<td>Oct. 7, 9, 11</td>
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<td>8</td>
<td>8/9</td>
<td>Oct. 14, 16</td>
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<td>9</td>
<td>9</td>
<td>Exam II – Oct. 21&lt;br&gt;Oct. 23, 25</td>
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<td>10</td>
<td>9/10</td>
<td>Oct. 28, 30, Nov. 1</td>
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<td>11</td>
<td>11</td>
<td>Nov. 4, 6, 8</td>
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<td>12</td>
<td>11</td>
<td>Nov. 11, 13, 15</td>
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<tr>
<td>13</td>
<td>12</td>
<td>Exam III – Nov. 18&lt;br&gt;Nov. 20, 22</td>
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<tr>
<td>14</td>
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<td>No classes - Thanksgiving break</td>
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<tr>
<td>15</td>
<td>12/Review</td>
<td>Dec. 02, 04, 06</td>
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<tr>
<td>16</td>
<td>Final Exam</td>
<td>December 13 2019 (2 – 5 p.m.)&lt;br&gt;Room TBA</td>
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