Instructor Information

Instructor: Chris Weaver
Office: UAPTC Office
Mailbox: TBA
Hours: Wednesday 2 – 3 PM
Phone: 501-454-2228
Email: cweaver@uaptc.edu

*All emails and telephone calls will receive a response within two business days.

Chair: Thomas Russell 501-812-2705 trussell@uaptc.edu
Dean: Dr. Marico Bryant-Howe 501-812-2342 mbryanthowe@uaptc.edu

*If your emails and telephone calls do not receive a response within two business days, the appropriate chain of command is above.

Course Information

Course lecture: Mondays and Wednesdays 12:35 – 1:50 PM (Baptist Health College Rm. 1406)
Course lab: Mondays 2:00 – 3:45 PM (Baptist Health College Chemistry Lab)

Catalog Description

CHEM 1403. Fundamental Chemistry I
This is an algebra-based chemistry course specifically designed for majors in health-related professions. The course content provides a foundation for work in health-related areas and is not appropriate for chemistry or other science majors or pre-professional students. Nomenclature, atomic and molecular structure, bonding and reactions are explored. Lab is required. Prerequisite: MATH 1302 with a grade of “C” or better. 3 lecture hours, 2 lab hours. (4 credit hours/special course fee)

Course Materials

Required textbooks:
- Laboratory Guide for Fundamental Chemistry I, Pulaski Tech Bookstore

Required materials: Scientific calculator (TI 30, TI 83, or TI 84) and laboratory goggles

Mission Statement
University of Arkansas – Pulaski Technical College provides access to high-quality education that promotes student learning and enables individuals to develop to their fullest potential.

**Institutional Learning Outcomes and General Education**

UA-PTC supports a college-wide institutional learning assessment program which concerns effective instructional methods and promotes student learning achievement by assessing:

1. Communication
2. Critical Thinking
3. Cultural Awareness
4. Information Literacy
5. Professionalism
6. Quantitative Literacy
7. Technology Literacy

For more information, please consult the following website: https://uaptc.edu/sla

**Department / Discipline or Program Learning Outcomes**

The Physical Science department, consistent with the College’s mission and the Division’s objectives, encourages the success of its students in the health related fields and academic disciplines emphasizing Critical Thinking and Quantitative Literacy by the following program outcomes:

1. The student will realize the definition of the specific discipline under study.
2. The student will assign and demonstrate the use of significant figures in numbers used in calculations resulting in values and units dictated by the rules of significant figures.
3. The student will begin with measurement values and units and make unit conversions between the Metric and American systems.
4. The student will build a pictorial and mental model of the chemical elements based on their internal and external structure.
5. The student will generate the appropriate electron configuration in both neutral and charged elements for use in making compounds.
6. The student will apply the rules of naming compounds to include ionic, covalent, acids, and bases.
7. The student will utilize the attractive properties of elements and ions in the formation of both the ionic and covalent bond.
8. The student will arrange both ionic and covalent compounds and some elements in the appropriate form of a balanced chemical equation.
9. The student will apply the mole concept to the balanced chemical equation to calculate the amounts of substances that are involved during a chemical change.

**Student Learning / Course Outcomes**
ACTS # CHEM 1214

Expected Student Learning Outcomes:
The student will explain, describe, discuss, recognize, and apply knowledge of the following:

- Measurements and unit conversions
- Structure and composition of the atom
- Periodic table
- Ionic and covalent bonding
- Inorganic nomenclature
- Chemical reactions
- Basic Stoichiometry
- Gas laws
- Solutions
- Energy of reactions
- Acid/base reactions and equilibria
- Identifying Oxidation-Reduction Reactions
- Nuclear Chemistry

Policies

Report a Complaint or Concern

UA-PTC takes very seriously complaints and concerns regarding the institution. Most complaints or concerns of a specific nature should be initiated and resolved at the campus level through normal college processes whenever possible. UA - Pulaski Technical College receives and resolves complaints using a variety of methods. To report a complaint or concern, please follow the link below.

https://www.uaptc.edu/report-a-concern-complaint

UA-PTC Attendance Policy

Education at UA-PTC requires students’ active involvement in the learning process. Thus, students are expected to attend all classes and actively engage in all learning assignments and/or opportunities provided in their classes. Class attendance should be treated as mandatory by all students as attendance will be taken by all instructors during the first two weeks of class. Additionally, a written policy on student attendance that is tied to course objectives and included in a course syllabus will be provided for each course by instructors.

Departmental Attendance Policy

Due to the importance of labs, four or more missed labs will result in a total lab grade of 0.

Course Policies
The UA-PTC Catalog rules and regulations will be enforced in this course at all times. Please consult the following website for more information: https://www.uaptc.edu/catalog

Professional behavior is required. Punctual attendance and intelligent participation are expected. Particulars as determined by the instructor are detailed in the paragraph below.

Appropriate behavior is expected for all communications, including any notes, email messages, or telephone conversations. Some guidelines for communication are included in this syllabus to help you.

**Grading Policy**

Letter grades will be based on the following scale:

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90 to 100%</td>
<td>A</td>
</tr>
<tr>
<td>80 to 89%</td>
<td>B</td>
</tr>
<tr>
<td>70 to 79%</td>
<td>C</td>
</tr>
<tr>
<td>60 to 69%</td>
<td>D</td>
</tr>
<tr>
<td>0 to 59%</td>
<td>F</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Work</th>
<th>Total</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams: 4 exams</td>
<td>400 pts</td>
<td>40%</td>
</tr>
<tr>
<td>Final</td>
<td>200 pts</td>
<td>20%</td>
</tr>
<tr>
<td>Labs</td>
<td>250 pts</td>
<td>25%</td>
</tr>
<tr>
<td>Attendance</td>
<td>80 pts</td>
<td>8%</td>
</tr>
<tr>
<td>Homework</td>
<td>50 pts</td>
<td>5%</td>
</tr>
<tr>
<td>Paper</td>
<td>20 pts</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1000 pts</strong></td>
<td><strong>100%</strong></td>
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</tbody>
</table>

* Instructors have one week to provide feedback and post grades for all assignments unless otherwise noted by a departmental policy that has been approved by the Dean of the School.

In an online class, eligibility for Financial Aid is based on student participation. Logging into the course does not constitute participation. For purposes of roster certification, students must complete a gradable attendance artifact.

Exams: Exams will be made of multiple-choice questions. You must have a scientific calculator for the exams (no phones). Each exam will be worth 100 points. There will be no make up exams.

Final: The final will be comprehensive. The questions will be multiple choice. The final will be worth 200 points. The percentage grade on the final will replace the lowest exam grade (including a missed exam).
Labs: There will be a total of 13 labs during the semester. Each lab has a prelab that must be turned in at the beginning of the lab period on the day the lab is scheduled. Your lab grade will be calculated on 12 labs and 13 prelabs. Your lowest lab grade will be dropped.

Students must have proper goggles for the labs. Your instructor will inform you when you will need the goggles. If you must remove your goggles during a lab during which they are required, you must leave the lab room and come back in with the goggles on when you are ready to continue. Contact lenses and eyeglasses do not count as proper eye protection.

Students can not bring in food or drinks into the lab.

Attendance: Attendance will be taken every class period. You will receive 2 points for attendance a day up to a total of 80 points.

Homework: A list of homework problems can be found in the syllabus. Due dates can be found on the homework problem list.

Paper: Write a 2 ½ to 3 ½ page research paper based on a topic in chemistry (instructor approved). It must have four academic sources with at least one each from print, electronic and periodical media. The paper must be submitted to the instructor as a hard copy (stapled upper left corner.) Please write your own words throughout the paper. Plagiarism is a serious, specific violation of PTC’s Academic Integrity Policy; dealt with per the Student Handbook. Keep all quotes minimal (one sentence) and explain them in the paragraph containing them.

1. Times New Roman 12 point font, double spaced, default margins
2. References must be listed on a separate page of the report and internally referenced within the paper.

The paper is due Wednesday, November 14.

**Academic Integrity**

It is expected that all students who attend UA-PTC conduct themselves in a manner appropriate for the college experience. Academic integrity is a vital component of collegiate behavior. The UA-PTC catalog states, “The gaining of knowledge and the practice of honesty go hand-in-hand.”

The catalog also states, “The responsibility and authority of initiating discipline arising from violations of the rules against dishonesty during the process of the course are vested in the instructor of that course.”

The complete Academic Integrity Policy is in the UA-PTC code of conduct.

Plagiarism is a serious issue. Plagiarism includes any of the following:
- Not including a Reference page
- Not internally citing references
-Using extensive quotes (use properly cited paraphrases instead) even when those quotes are cited correctly
-Using someone else’s words as your own

Plagiarism can lead to a grade of zero on the paper, an F as a final grade for the course, and/or administrative action.

**Accommodation Policy**

Services for Students with Disabilities: UA-PTC is committed to fulfilling all federal requirements as stated in the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and the American with Disabilities Amendments Act (ADAAA) of 2008. Accommodations are available to students who have documented disabilities. Students who request accommodations must register with the Disability Services Office (Main Campus: 501-812-2738 or South Campus: 501-812-2862) and must provide current and relevant documentation.

Students requesting accommodations should inform the instructor at the beginning of the course or as soon as accommodations are approved. It is the student's responsibility to provide their Accommodation Letter to the instructor. Accommodations are not retroactive and will only be provided once your instructor receives the Accommodation Letter.

**Student Code of Conduct**

All students are expected to abide by the UA-PTC Student Code of Conduct. For the full Student Code of Conduct, access the most current version of the UA-PTC Academic Catalog. http://uaptc.azurewebsites.net/docs/default-source/course-catalog/2017-18-academic-catalog.pdf?sfvrsn=a08a3038_2

**Sexual Misconduct**

No person at UA-PTC will, on the basis of gender, be excluded from participation in, be denied benefits of, or be subjected to sex discrimination, sexual harassment or sexual misconduct under any education program or activity. All college administrative policies and procedures regarding sex discrimination, sexual harassment, and sexual misconduct are in compliance with Title IX. Students who feel they are victims of sexual misconduct should contact the UA-PTC Title IX Deputy Coordinator for Students:

Michelle Anderson, Director of Student Life and Leadership
Campus Center Building Room 216
501-812-2756
manderson@uaptc.edu

**Course Evaluations**
Students may be asked to evaluate their instructor and course near the end of the semester. These student evaluations are very important to the improvement in the quality of instruction and course materials. All results are anonymous and shared with the faculty only after the semester is over and grades have been posted.

Information Literacy

UA-PTC is committed to the Information Literacy Competency Standards for Higher Education as established by the Association of College and Research Libraries and endorsed by the National Forum on Information Literacy. Therefore, all courses will incorporate an information literacy component so that, by graduation, all students will be able to recognize the need for information, then locate, evaluate, synthesize, and communicate information in an ethical manner. Information literacy encompasses critical thinking, research, media, technology, health, business, and visual literacy skills to produce lifelong learners who can make informed decisions in the workplace and in their personal lives.

Tentative Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Assignments/Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>August 15</td>
<td>Lecture- Syllabus and Scientific Method</td>
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</tbody>
</table>
| 2    | August 20 and 22 | Monday:  
- Lecture: P. 2-8  
- Chemistry  
- Major Areas of Chemistry  
- Scientific Method  
- Models in Chemistry  
- States of Matter  
- Physical/Chemical Properties and Change  
- Lab 2: Metric and American Conversions  
Wednesday:  
- Lecture: P. 9-20  
- Composition of Matter/Classification of Matter  
- Mass, Length, Volume, and Time  
- Significant Figures (with computations)  
- Scientific Notation |
| 3    | August 27 and 29 | Monday:  
- Lecture: P. 20-49  
- Problem Solving and Calculator  
- Converting Units  
- Dimensional Analysis  
- Temperature  
- Energy  
- Density  
- Electrons, Protons, and Neutrons  
- Isotopes  
- Dalton’s Theory  
- Lab 3: Significant Figures and Density  
Wednesday:  
- Lecture: P. 55-67  
- Bohr’s Atom  
- Modern Atomic Theory  
- Periodic Law/Periodic Table  
- Groups, Periods, Metals, Nonmetals  
- Information on Periodic Table |
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Monday:</th>
<th>Wednesday:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>September 3 and 5</td>
<td>- Labor Day (No lecture or lab)</td>
<td>- Lecture: P. 67-89&lt;br&gt;Short-hand Electron Configuration&lt;br&gt;Valence Electrons&lt;br&gt;Octet Rule&lt;br&gt;Ions&lt;br&gt;Ion Formation/Octet Rule&lt;br&gt;Atomic Size&lt;br&gt;Ionization Energy&lt;br&gt;Electron Affinity&lt;br&gt;Electronegativity&lt;br&gt;Lewis Symbols&lt;br&gt;Ionic/Covalent Bonds</td>
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<td>5</td>
<td>September 10 and 12</td>
<td>- Lecture: Exam 1 (Chapter 1)</td>
<td>- Lecture: P. 89-91&lt;br&gt;Ionic/Covalent Bonds&lt;br&gt;Polar Covalent/Electronegativity</td>
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<tr>
<td>6</td>
<td>September 17 and 19</td>
<td>- Lecture: P. 92-99&lt;br&gt;Ionic Compound Formulas/Name&lt;br&gt;Structure of Solid Compounds&lt;br&gt;Solution of Ions and Compounds&lt;br&gt;- Lab 4: Identity of a Liquid</td>
<td>- Lecture: P. 99-109&lt;br&gt;Lewis Structure of Molecules&lt;br&gt;Lewis Structure of Polyatomic Ions&lt;br&gt;Lewis Structures and Resonance</td>
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<tr>
<td>7</td>
<td>September 24 and 26</td>
<td>- Lecture: P. 110-115&lt;br&gt;Lewis Structure Exceptions to Octet Rule&lt;br&gt;VSEPR&lt;br&gt;- Lab 5: Percent Water in a Hydrate</td>
<td>- Lecture: P. 115-120&lt;br&gt;Periodic Structure Relationship&lt;br&gt;Lewis Structure and Polarity&lt;br&gt;Solubility&lt;br&gt;Boiling Point/Melting Point</td>
</tr>
<tr>
<td>8</td>
<td>October 1 and 3</td>
<td>- Lecture: P.128-134&lt;br&gt;Mole and Avogadro's Number&lt;br&gt;Calculating Atoms, Moles, and Mass&lt;br&gt;Chemical Formula&lt;br&gt;- Lab 6: Separating a Binary Mixture</td>
<td>- Lecture: P. 134-139&lt;br&gt;Formula Mass/Molar Mass&lt;br&gt;A Recipe for Chemistry</td>
</tr>
</tbody>
</table>
## Course Syllabus

### Fall 2018

<table>
<thead>
<tr>
<th>Week</th>
<th>Date Range</th>
<th>Important Dates and Topics</th>
</tr>
</thead>
</table>
| 9    | October 8 and 10 | Monday:  
- Lecture: Exam 2 (C. 2-3)  
- Lab 7: Molecular Geometry  
Wednesday:  
- Lecture: P.140-149  
Balancing Chemical Equations  
Classifying Chemical Equations  
Chemical Equations-General Principles |
| 10   | October 15 and 17 | Monday:  
- Lecture: P. 149-170  
Chemical Equations/Conversion Factors  
Theoretical Yield  
Percent Yield  
Measure of a Gas  
Boyle’s Law  
- Lab 8: Gram, Mole, and Particle Conversions  
Wednesday:  
- Lecture: P. 170-175  
Charles’s Law  
Combined Gas Law  
Avogadro’s Law  
Molar Volume of Gas |
| 11   | October 22 and 24 | Monday:  
- Lecture: P. 176-185  
Ideal Gas Law  
Dalton’s Law of Partial Pressures  
Vapor Pressure of a Liquid  
Hydrogen Bonding  
- Lab 9: Chemical Reactions  
Wednesday:  
- Lecture: P. 194-206  
General Properties of Liquid Solutions  
Degree of Solubility  
Solubility and Equilibrium  
Solubility of Gases/Henry’s Law  
Mass/Volume Percent  
Mass/Mass Percent  
Parts Per Thousand/Millions/Billions  
Molarity Dilution |
| 12   | October 29 and 31 | Monday:  
- Lecture: Exam 3 (C. 3-4)  
- Lab 10: Molar Relationships in Reactions  
Wednesday:  
- Lecture: P. 206-210  
Vapor Pressure Lowering  
Freezing Point Depression/Boiling Point Elevation |
| 13   | November 5 and 7 | Monday:  
- Lecture: P. 210-238  
Osmolality  
Electrolytes in a Solution  
The Chemical Reactions and Energy  
Energy Change in a Reaction  
- Lab 11: Gas Concepts |
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
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</table>
| Wednesday  | - Lecture: P. 246-252  
- Physical Equilibrium  
- Chemical Equilibrium  
- Equilibrium Constant  
- Le Chatelier's Principle |
| Monday     | - Lecture: P. 262-264  
- Arrhenius Theory  
- Bronsted-Lowry Theory  
- Acid/Base Properties of Water  
- Acid/Base Strength  
- Lab 12: Acetic Acid Content of Vinegar |
| Wednesday  | - Lecture: P. 264-277  
- Conjugate Acids and Bases  
- Dissociation of Water  
- Definition of pH  
- Measuring pH  
- Neutralization  
- Polyprotic Acids |
| Monday     | - Lecture: P. 278-288  
- The Buffer Process  
- Addition Acid/Base to Buffer  
- Control pH of Blood  
- Oxidation/Reduction  
- Biological Processes  
- Lab 13: Making Solutions |
| Wednesday  | - Lecture: P. 298-300  
- Alpha Particles  
- Beta Particles  
- Gamma Rays  
- Properties of Alpha/Beta/Gamma |
| Monday     | - Lecture: Exam 4 (C. 5-8)  
- Final Lab  
- Lecture: P. 301-308  
- Alpha Decay  
- Beta Decay  
- Positron Emission  
- Gamma Production  
- Predicting Nuclear Decay  
- Nuclear Structure  
- Half-life |
| Homework Assignments |
| Chapter 1 (Due Wednesday, September 5) |
| Q1.51, Q1.45, Q1.57, Q1.79 b, d; Q1.91 a, b; Q1.93 a, b; Q1.95, Q1.97, Q1.115, Q1.121, Q1.125, Q1.123, Q1.133 |
| Chapter 2 (Due, Wednesday, October 3) |
| Q2.35, Q2.37, Q2.85, Q2.87, Q2.93, Q2.101 |
Chapter 3 (Due Wednesday, October 3)
Q3.23, Q3.25, Q3.37, Q3.43, Q3.45, Q3.41, Q3.51, Q3.79, Q3.83, Q3.87, Q3.101, Q3.103, Q3.95

Chapter 4 (Due Wednesday, October 24)
Q4.15, Q4.17, Q4.19, Q4.21, Q4.29, Q4.25, Q4.33, Q4.35, Q4.37, Q4.67, Q4.71 a, b, c; Q4.71 d, e;
Q4.73, Q4.77, Q4.79, Q4.27, Q4.85, Q4.87, Q4.89, Q4.93, Q4.95, Q4.101

Chapter 5 (Due Wednesday, November 28)
Q5.35, Q5.51, Q5.53, Q5.59, Q5.63, Q5.67

Chapter 6 (Due Wednesday, November 28)
Q6.23, Q6.33, Q6.27, Q6.37, Q6.41, Q6.43, Q6.49, Q6.47, Q6.65 a, Q6.65 b, Q6.81, Q6.71, Q6.93,
Q6.101, Q6.105

Chapter 7 (Due Wednesday, November 28)
Q7.23, Q7.41, Q7.35, Q7.49, Q7.77, Q7.81, Q7.83, Q7.85, Q7.87

Chapter 8 (Due Wednesday, November 28)
Q8.29, Q8.49, Q8.51, Q8.53, Q8.55, Q8.67, Q8.63, Q8.77, Q8.87, Q8.91

Chapter 9 (Due Friday, December 14)
Q9.43, Q9.45, Q9.51, Q9.63

Final Exam Schedule: 10:30 – 12:30, Friday, December 14

Disclaimer: This schedule is a guide for the semester. The instructor reserves the right to amend the schedule as necessary.
Course Agreement Form

Read, complete, and return to instructor:

I have read the course syllabus for Chris Weaver's Fundamentals of Chemistry I class at Pulaski Technical College, and I understand its content. I also understand the rules for the class, and I will follow and abide by these rules, including those relating to attendance, assignments, grading criteria, plagiarism, and behavior.

Semester

Date

Print name

Signature

UA-UA-PTC Email address

Telephone