CHEM-1013 General Inorganic Chemistry I
Fall 2017

Instructor: Dr. Gina Chiarella
Section # and CRN: P01 - 10004
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Email Address: gmchiarella@pvamu.edu
Office Hours: M, 11-12 am, T, W 11 am-3 pm, R 11 am - 2 pm.
Mode of Instruction: Face to Face

Course Location: E. E. O’Bannion, Room 122
Class Days & Times: TR 9:30 – 10:50 am
Catalog Description: General Inorganic Chemistry I. (3.0) Credit 3 semester hours. This course is designed for non-majors and non-minors. This first semester course entails exploration of the fundamental concepts, laws and theories of chemistry through study of the states of matter; a descriptive view of the periodic chart, chemical properties, reactions, chemical bonding theory and stoichiometry.

Prerequisites: MATH 1113
Co-requisites: MATH 1113


Student Learning Outcomes:

<table>
<thead>
<tr>
<th>Program Learning Outcome #</th>
<th>Core Curriculum Outcome Alignment</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Have an understanding and appreciation of the Scientific Method (Approach)</td>
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<tr>
<td>2</td>
<td>Be familiar with the conceptual approach to problem solving</td>
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<tr>
<td>3</td>
<td>Become familiar with the dynamic nature of chemistry and its applicability in numerous facets of life</td>
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<tr>
<td>4</td>
<td>Be familiar with the underlying principles of the chemical and physical properties of elements, ions, molecules and compounds</td>
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<tr>
<td>5</td>
<td>Be able to balance a variety of chemical reaction equations and perform basic stoichiometric quantitative calculations</td>
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<tr>
<td>6</td>
<td>Have a good understanding of the electronic configuration of simple atoms, ions and molecules and have an appreciation for how the properties of substances are related to their electronic structure</td>
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<tr>
<td>7</td>
<td>Be able to draw Lewis of typical molecules, and relate these structures to molecular shape, geometry, bond polarity and electronegativity</td>
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</tbody>
</table>
Major Course Requirements
This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

Method of Determining Final Course Grade

<table>
<thead>
<tr>
<th>Exams</th>
<th>10 assignments at 10 points each</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial Exam (best 3 out of 4)</td>
<td>100 each</td>
<td>300</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
<td>100</td>
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</tbody>
</table>

**Total**: 500

**Grading Criteria and Conversion:**

- **A** = 500 – 450pts;
- **B** = 449 – 400pts;
- **C** = 399 – 350pts;
- **D** = 349 – 300pts;
- **F** = 299pts or below

**Detailed Description of Major Assignments:**

<table>
<thead>
<tr>
<th>Assignment Title or Grade Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of Assignments:</td>
<td>Post chapter problems and exercises will not be graded. The assignments are intended to help the students better understand the lecture material and also help to prepare the students for the upcoming exams. This work is an extension of the work covered in the classroom.</td>
</tr>
</tbody>
</table>

| Formatting Documents: | Microsoft Word is the standard word processing tool used at PVAMU. If you’re using other word processors, be sure to use the “save as” tool and save the document in either the Microsoft Word, Rich-Text, or plain text format. |

| Exam Policy | Exams should be taken as scheduled. No makeup examinations will be allowed except under documented emergencies (See Student Handbook). A scientific calculator is required for exam taking. Students will not be allowed to use telephone or other communicating devices to make calculations |

**Course Procedures or Additional Instructor Policies**

**Taskstream**

Taskstream is a tool that Prairie View A&M University uses for assessment purposes. One of your assignments
Semester Calendar

<table>
<thead>
<tr>
<th>Week One:</th>
<th>Chapter 1 - Basic Concepts of Chemistry</th>
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</thead>
<tbody>
<tr>
<td>Topic Description</td>
<td></td>
</tr>
</tbody>
</table>
| Readings: | T = Classification of matter according to physical state and composition, Physical and chemical properties  
R = Intensive and extensive properties, Experimental measurements, units, Temperature measurement |
| Assignment (s): | T = On-line Homework 1  
R = On-line Homework 1 |
| Week Two: | Chapter 1 - Tools of Quantitative Chemistry |
| Topic Description | | 
| Readings: | T = Conversion factors, Density, Precision, Accuracy,  
R = Experimental Error, and Standard Deviation, Scientific notation, Significant figures |
| Assignment (s): | T = On-line Homework 1  
R = On-line Homework 1 |
| Week Three: | Chapter 2 - Atoms Molecules and Ions |
| Topic Description | | 
| Readings: | T = Subatomic particles, Atomic structure, Isotopes, percent abundance  
R = Atomic Weight, Periodic table, Compounds and Molecules, Chemical equations, Ionic Compounds |
| Assignment (s): | T = On-line Homework 2  
R = On-line Homework 2 |
| Week Four: | Chapter 2 - Atoms Molecules and Ions |
| Topic Description | | 
| Readings: | T = Nomenclature, Monatomic ions, Polyatomic ions, formulas, Properties of Ionic Compounds, Mole, Avogadro's Number Molecular mass vs Molar mass, Percentage composition, Empirical vs Molecular Formula, Hydrates  
R = Exam (chapters 1 and 2) |
| Assignment (s): | T = On-line Homework 2  
R = On-line Homework 2 |
| Week Five: | Chapter 3 - Chemical Reactions |
| Topic Description | | 
| Readings: | T = Balancing chemical Equations, Electrolyte vs. Non-electrolyte, Conductivity Properties  
R = Evidence of a chemical reaction, types of reactions , Solubility Rules, Equations for aqueous solutions |
| Assignment (s): | T = On-line Homework 3  
R = On-line Homework 3 |
| Week Six: | Chapter 3 - Chemical Reactions |
| Topic Description | | 
| Readings: | T = Precipitation Reactions, Acids and Bases, Neutralization, Oxidation-Reduction Reactions  
R = Oxidation Numbers rules, Balancing Redox Reactions: , The Half-Reaction Method |
| Assignment (s): | T = On-line Homework 3  
R = On-line Homework 3 |
| Week Seven: | Chapter 4 - Stoichiometry: Quantitative Information About Chemical Reactions |
| Topic Description | | 
| Readings: | T = Stoichiometry, Mole-to-Mole Calculations, Reactions Involving a Limiting Reactant  
R = Reaction Yields, Chemical Analysis, Determining the Formula of Hydrocarbon by Combustion |
| Assignment (s): | T = On-line Homework 4  
R = On-line Homework 4 |
| Week Eight: | Chapter 4 - Stoichiometry: Quantitative Information About Chemical Reactions |
Readings:
T = Solutions and Concentration, Molarity, Dilutions, Solution Stoichiometry, Titrations
R = Exam (chapters 3 and 4)

Assignment (s):
T = On-line Homework 4
R = On-line Homework 4

Week Nine:
Topic Description
Chapter 5 - Principles of Chemical Reactivity: Energy and Chemical Reactivity:
Energy and Chemical Reactions
Readings:
T = Conservation of Energy Law, First Law of Thermodynamics, Change in Internal Energy, State functions
R = Internal Energy (E) and Enthalpy (H), The Thermodynamic Standard State, Physical Enthalpies, Energy and Changes of State, Exothermic and Endothermic Processes

Assignment (s):
T = On-line Homework 5
R = On-line Homework 5

Week Ten:
Topic Description
Chapter 5 - Principles of Chemical Reactivity: Energy and Chemical Reactivity:
Energy and Chemical Reactions
Readings:
T = Calorimetry, Relation between $\Delta T$ and Heat ($q$) Heat Capacity, Specific Heat Capacity, Standard Heats of Formation, Hess’s Law
R = Bond Dissociation Energies, Heats of Combustion, Entropy, Free Energy, Predicting the sign of $\Delta S$, Free Energy and spontaneity

Assignment (s):
T = On-line Homework 5
R = On-line Homework 5

Week Eleven:
Topic Description
Chapter 10 - Gas properties
Readings:
T = Properties of a Gas, Parameters Affecting Gases, Pressure, Measurement of Pressure, Pressure Units, Measuring Pressure: Manometer

Assignment (s):
T = On-line Homework 6
R = On-line Homework 6

Week Twelve:
Topic Description
Chapter 10 - Gas properties
Readings:
T = Dalton’s Law of Partial Pressures, Mole Fraction & Partial Pressure, Collecting a Gas over Water, Kinetic Molecular Theory, Diffusion and Effusion, Graham’s Law, Real Gases, Deviations from Ideal Behavior
R = Exam (chapters 5 and 10)

Assignment (s):
T = On-line Homework 6
R = On-line Homework 6

Week Thirteen:
Topic Description
Chapter 6 - Atoms and Molecules: The structure of atoms,
Readings:
T = Electromagnetic radiations, Wave equation, Behavior of waves: Diffraction, Interference, Refraction, Photoelectric Effect-Einstein, Particle-like Properties of light, Atomic light spectra, Light and Bohr Atomic Model
R = The Wavelike Nature of Matter, Quantum Mechanics, Wave Functions and Quantum Numbers, The Shapes of Orbitals, Pauli Exclusion Principle, Electronic configurations, Aufbau principle, Electron Configurations of ions, Effective Nuclear Charge ($Z_{\text{eff}}$)

Assignment (s):
T = On-line Homework 7
R = On-line Homework 7

Week Fourteen:
Topic Description
Chapter 7 - Periodic Trends
Readings:
T = Electron Configurations and Periodic Properties: Atomic Radii, First Ionization Energy
R = Higher Ionization Energies, Electron Affinity

Assignment (s):
T = On-line Homework 8
R = On-line Homework 8

Week Fifteen:
Topic Description
Chapter 8 - Bonding and Molecular Structure
Readings:
T = Chemical Bonds, Electronegativity, Covalent Compounds, Polar Covalent Bonds,
Week Sixteen:

**Topic**: Chapter 9 - Orbitals

**Readings**:
- T = Valence-Bond Theory, Hybridization, Molecular orbitals
- R = Exam (chapters 6, 7, 8 and 10)

**Assignment(s)**:
- T = On-line Homework 10
- R = On-line Homework 10

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**Student Support and Success**

**John B. Coleman Library**

The library and its partners have as their mission "to provide resources and instructional material in support of the evolving curriculum, as a partner in Prairie View A&M University's mission of teaching, research, and service" and to support the University's core values of "access and quality, diversity, leadership, relevance, and social responsibility" through emphasis on ten key areas of service. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty.

**Center for Academic Support**

The Center for Academic Support (CAS) offers Tutoring via peer tutoring. The services include workshops (i.e., Save My Semester, Recalculate Your Route), seminars (i.e., Tools You Can Use: TI-84), group review sessions (i.e., College Algebra Topic Reviews, GRE Preparation), group study opportunities (i.e., TSIA, HESI, Study Break, Exam Cram), and test-taking strategies (How to take Notes, Study Buddy, 5 Day Study Guide). The Tutoring Center is a nationally certified tutoring program through the National Tutoring Association. The peer tutors are trained and certified by the coordinator each semester. Location: J.B. Coleman Library

**COMPASS**

The Center for the Oversight and Management of Personalized Academic Student Success (COMPASS) is designed to help Prairie View students in their second year and beyond navigate towards graduation by providing the following services: Academic Advisement, Targeted Tutorials for Personalized Learning, Campus-Wide Referrals, and Academic & Social Workshops. Location: J.B. Coleman Library

**Writing Center**

The Writing Center provides student consultants on all aspects of the writing process and a variety of writing assignments. Writing Center consultations assist students in such areas as prewriting, brainstorming, audience awareness, organization, research, and citation. Location: Hilliard Hall 121

**University Rules and Procedures**

**Disability statement (See Student Handbook):**

Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

**Academic misconduct (See Student Handbook):**

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

**Forms of academic dishonesty:**

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.

3. Fabrication: use of invented information or falsified research.

4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else’s words, ideas, or data as one’s own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one’s own work also constitutes plagiarism.

Nonacademic misconduct (See Student Handbook)
The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):
Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy
Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student’s course grade being reduced or in assignment of a grade of “F”. Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process
Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Disability statement (See Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

TECHNICAL CONSIDERATIONS

Minimum Recommended Hardware and Software:
- Intel PC or Laptop with Windows 7; Mac with OS X; Smartphone or iPad/Tablet with Wi-Fi
- High speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15” monitor, 800x600, color or 16 bit
- Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse
- Most current version of Google Chrome, Safari, Internet Explorer or Firefox

Note: Be sure to enable Java & pop-ups

Participants should have a basic proficiency of the following computer skills:
- Sending and receiving email
- A working knowledge of the Internet
• Proficiency in Microsoft Word (or a program convertible to Word)
• Proficiency in the Acrobat PDF Reader
• Basic knowledge of Windows or Mac O.S.

Netiquette (online etiquette):
Students are expected to participate in all discussions and virtual classroom chats as directed. Students are to be respectful and courteous to others on discussions boards. Foul or abusive language will not be tolerated.

Technical Support:
Students should go to https://mypassword.pvamu.edu/ if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Office of Distance Learning at 936-261-3283

Communication Expectations and Standards:
Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

Discussion Requirement:
Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can take place in a seminar fashion. This will be accomplish by the use of the discussion board. The exact use of discussion will be determined by the instructor.

It is strongly suggested that students type their discussion postings in a word processing application and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, it should be copied and pasted to the discussion board.