Introductory Chemistry
CHE 101-001 and CHE 101L-020
MW 1:00-2:50
Room: Math 130
Class Syllabus; Spring 2018

<table>
<thead>
<tr>
<th>Name</th>
<th>Catherine Kwiatkowski (Ms. K)</th>
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<tbody>
<tr>
<td>Department</td>
<td>Chemistry &amp; Biochemistry</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:kwiatkowc@sfasu.edu">kwiatkowc@sfasu.edu</a></td>
</tr>
<tr>
<td>website</td>
<td>course information on D2L</td>
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<tr>
<td>Phone</td>
<td>936-468-2175</td>
</tr>
<tr>
<td>Office</td>
<td>Math 110</td>
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<tr>
<td>Office Hours</td>
<td>MWF: 9:45-10:45, MW: 3:00-3:30</td>
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<td>TTh 2:00-3:00</td>
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<td>Separate appointments and drop-ins welcome.</td>
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**COURSE DESCRIPTION:**
Conceptual Chemistry is an introductory course for non-science majors. CHE 101 is an overview of the field of chemistry and its impact on science, technology, society, and environment. This conceptual approach involves a minimum of mathematics and investigates the chemistry found in the world around us that impacts you and your immediate and extended environment. This course utilizes an integrated lecture/lab format. Lab fee required.

The course is organized to investigate chemistry within the body, in the home, and in the community (social and industrial).

![Image of conceptual chemistry investigation]

**TEXT AND MATERIALS:**
Lab Manual: *Chemistry in Context: Apply Chemistry to Society. ACS, 8th edition*
Textbook: Instead of a textbook, please print out notes as they become available on D2L. Come ready to highlight key points and write additional comments off to the side. Time is not allotted to write notes.

**GRADING POLICY:**

3 exams (100 pts each). Exams are take-home exams and consist of short answer and essay. Plagiarism will result in a zero.

Quizzes - Quizzes will be every week on D2L, except 2 in-class quizzes. They are multiple choice and/or T/F. Lowest quiz will be dropped. If you have computer issues or you missed a
quiz (excused absences only), you may make up the quiz within the week on paper, in my office, closed book.

**Oral Presentation (2)** – Two student presentations on the following topics:

1) Choose a chemist (past or present), explain his discovery/contribution to science and its impact on society.

2a) Choose a controversy that is focused around a chemistry topic (such as an environmental issue or health issue) and present both sides of the argument...OR

2b) Choose a current/future chemical product that is being developed, describe it in detail, and explain the potential benefit (and potential problem, if relevant.)

**Laboratories** (Average - 200 pts) - Labs are interwoven with lecture, so the dates are not set. Late lab reports earn a maximum of 70%. Teamwork rubric and evaluation is included under this category.

**GRADEBOOK AND CLASS MATERIAL:**

Grades are kept in D2L and are always available for students to see. Announcements are always being posted, so please check D2L frequently. All Powerpoints and Student Notes that we cover in class are posted beforehand. Print out notes. Class time is for highlighting key points, not writing notes. Please acquire lab manual before second week of class.

**Method of Evaluation:** The final grade will be based upon percentage of points obtained in the following:

<table>
<thead>
<tr>
<th>item</th>
<th>point value</th>
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<tbody>
<tr>
<td>Exam I</td>
<td>100</td>
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<tr>
<td>Exam II</td>
<td>100</td>
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<tr>
<td>Exam III (May 9, 1:00-3:00)</td>
<td>100</td>
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<tr>
<td>Quiz Average</td>
<td>100</td>
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<tr>
<td>Presentations (50 pts each)</td>
<td>100</td>
</tr>
<tr>
<td>Lab Average</td>
<td>200</td>
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<tr>
<td><strong>TOTAL POINTS</strong></td>
<td><strong>700</strong></td>
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**ATTENDANCE POLICY:**

Attendance in class is mandatory. Seven (7) or more unexcused absences will result in an ‘F’ for the course. Absences may be assigned to anyone who disrupts class, sleeps in class, or consistently comes in late or leaves early. If you arrive late and do not see the roll sheet, please contact the instructor immediately after class; otherwise it will be an absence. Out of politeness, tell instructor if there are circumstances in which you may arrive late or leave early.

**CLASSROOM BEHAVIOR EXPECTATIONS:**

- Come to class prepared (spend at least 2 hours working problems and reviewing previous material before each class period) and be on time and in your seat.
- **Computer Use:** If you want to view the Powerpoint on a closer screen using your computer, that’s acceptable. For many, it’s easier to take notes than looking back and forth between the big screen and
your paper. *If you browse websites, you are a distraction to everyone behind you.* They have paid almost $1000 for this course; let them get the most out of it.

- **No headphones** in your ears during lecture.
- Absences may be assigned to anyone that disrupts class, sleeps in class, or consistently comes in late or leaves early. Read Attendance Policy Section for how this can affect grades.
- Turn off and put away cell phones; **NO** text messaging during class. Anyone caught using a cell phone during class can have an absence assigned to them.
- Be courteous and respectful of other students and instructor.
- Learn your section number. Place section number on **all** items turned in.
- Make-up quizzes and tests are only given to students with an excused absence. If there are computer issues with D2L quizzes, an alternative on-paper quiz can be taken during my office hours.
- Cheating…not allowed or respected.
- Students who violate these rules will be asked to leave. Repeat offenders will be subject to disciplinary action in accordance with University policies as described in the Code of Student Conduct.

**ACADEMIC INTEGRITY (A-9.1):**

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

**Definition of Academic Dishonesty**

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at [http://www.sfasu.edu/policies/academic_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp)

*Any student found cheating will be subject to the penalties as stated in the Student Code of Conduct handbook; including but not limited to a score of zero on exam, expulsion from the class or expulsion from the University.*

**WITHHELD GRADES SEMESTER GRADES POLICY (A-54):**

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.
The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

**STUDENTS WITH DISABILITIES:**
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).

**CLASSROOM BEHAVIOR POLICY:**
Acceptable Student Behavior: Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

**CORE OBJECTIVES AND RESOURCES**

*NOTE: Assignments for assignment will be completed in the laboratory portion of the class.*

*Core Objective 1: Critical Thinking: to include creative thinking, innovation, inquiry and analysis, evaluation and synthesis of information.*

Definition of **CRITICAL THINKING**: disciplined thinking that is clear, rational, open-minded, and informed by evidence.


**Critical thinking** involves the use of a group of interconnected skills. The skills needed can be broken down into six steps.

**Six Steps of CRITICAL THINKING**

1. **Knowledge** means a student must have basic knowledge about the subject.

2. **Comprehension** requires understanding of the subject. Students that comprehend the new knowledge are able to relate the new knowledge to what they already know. Comprehending goes beyond simply parroting material back.
3. **Application** requires both knowledge and comprehension. Students must be able to carry out a task or apply their knowledge and comprehension to an assigned task.

4. **Analysis** involves breaking the knowledge down into smaller parts so it become clear how the smaller parts are related to other ideas.

5. **Synthesis** involves the ability to put together the parts you analyzed with other information to create something original

6. **Evaluation** occurs once we have understood and analyzed what is said or written and the reasons offered to support it. Then we can appraise this information in order to decide whether you can give or withhold belief, and whether or not to take a particular action.

Adapted from: [http://www.mhhe.com/socsicence/philosophy/reichenbach/m1_chap02studyguide.html](http://www.mhhe.com/socsicence/philosophy/reichenbach/m1_chap02studyguide.html) (accessed May 23, 2013)

**Core Objective 2: Communication Skills: to include effective development, interpretation and expression of ideas through written, oral, and visual communication.**

**COMMUNICATION SKILLS in the sciences**

For an excellent resource in scientific communication from a highly reputable source see the information provided on the Nature website link shown below.

[http://www.nature.com/scitable/topic/scientific-communication-14121566](http://www.nature.com/scitable/topic/scientific-communication-14121566) (accessed May 31,2013)

Three especially informative links within the link shown above are:

- Effective Communication
- Effective Writing
- Audience/Purpose

**Core Object 3: Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.**

**EMPIRICAL AND QUANTITATIVE SKILLS**

Chemists rely on observations to explain the nature of the substances they study. There are two types of observations exist: qualitative and quantitative. A **qualitative observation** is an observation made with the senses and is usually expressed using words instead of numbers. Qualitative observations about a person sick in the hospital might include that the person is breathing rapidly, has a high temperature, and is very thin.

A **quantitative observation** is an observation that requires a numerical measurement and describes something in terms of "how much". The quantitative observation that a person has a temperature of 103.6 °F is much more useful information than just knowing that the person has a fever. Quantitative observations are preferred by scientists. Often quantitative data is acquired in lab.
One or more measurement is always a part of any quantitative observation. A **measurement determines the dimensions, capacity, quantity, or extent of something**. The most common types of measurements made in chemical laboratories are those of mass, volume, length, temperature, pressure, and concentration. Measurements always consist of two parts: a **number**, which tells the amount of the quantity measured, and a **unit**, which tells the nature or kind of quantity measured. A measured number without a unit is meaningless.

Once quantitative data is obtained, chemists then mathematically manipulate and analyze data.

*Adapted from saplinglearning.com; accessed May 31, 2013*

**Core Objective 4: Teamwork:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

Definition of **TEAMWORK:** work done by several associates with each doing a part but all subordinating personal prominence to the efficiency of the whole.

*accessed May 23, 2013*

**TEAMWORK** General Rules

Each team member needs:

- all ideas evaluated critically;
- treat others in the group with respect
- everyone needs to pull their weight, meet deadlines, and contribute equally;
- actions need to be followed through;
- reporting needs to be accurate and comprehensive;
- problems with under-performing team members need to be discussed openly and resolved quickly; and
- peer assessment should be given fairly

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### Conceptual Chemistry  
**CHE 101: Spring 2018**

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<thead>
<tr>
<th>Powerpoint</th>
<th>Chemistry</th>
<th>Life Relevance</th>
<th>Lab</th>
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<tbody>
<tr>
<td>1. Matter Classification</td>
<td>1. Types of Matter</td>
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<td>Burning Mg demo;</td>
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<td>2. Physical &amp; Chemical Properties</td>
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<td>Gummy Bear demo</td>
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<td>3. Atom Models &amp; History</td>
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<td>Lab 3: Chromatographic Study of Dyes and Inks</td>
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<td>4. Isotopes &amp; Ions</td>
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<td>5. Periodic Table Organization</td>
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<td>Lab 22: Investigating Solubility</td>
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<tr>
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<td>2. Molar mass</td>
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<tr>
<td></td>
<td>3. Conversions</td>
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<td>4. Scientific Notation and Significant Figures</td>
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| 3. Our Bodies Pt 1 | Intramolecular Bonding; Intermolecular Forces | Electroyte Imbalances; DNA; ATP; Proteins (Insulin); Carbohydrates; Fats - saturated/unsaturated/Trans; Health issues & Cost to Society | Lab 14: Detecting Ions in Solution
Lab 31: Measuring the Sugar Content of Beverages. |
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<tr>
<td>4. Our Bodies Pt 2</td>
<td>Interpreting Organic Structures; Molecular Shape; (Lewis Dot Structures &amp; VSEPR Theory) Polarity</td>
<td>Enzyme &amp; Inhibitors (catalase/caffeine/HIV-protease inhibitor) Antibodies Artificial Sweeteners Penicillin Estrogen mimics Steroids</td>
<td>Lab 8: Molecular Models, Bonds, and Shapes</td>
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<td>5. Home Pt 1: Kitchen, Bath, Laundry</td>
<td>Types of Reactions; Balancing Equations; Forms of Energy; Exothermic and endothermic rxns; Specific Heat Capacity; Halogens; Acids and Bases</td>
<td>Chemicals and Cleaners in Kitchen; How microwaves and refrigerators work; Characteristics of different pans, PFOA in Teflon, BPA/BPS, Soap vs. Detergent; Dangerous chemical mixes.</td>
<td>Lab 11: Hot Stuff: An Energy Conservation Problem.</td>
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</table>
| 6. Home Pt 2; Basement; Garage; Lawn | Acids and Bases; Water; pH; Buffers; Colligative Properties; Gas Laws; Chemical action in Fertilizers, Pesticides, and Herbicides | Radon in your home; How a car battery, A/C, and antifreeze work; Accidental antifreeze ingestion & blood’s buffering system; Tire Volume, Pressure & Temperature relationships; (Deep Horizon Oil Spill); CO & CO₂ Poisoning; Health effects of Lawn chemicals. | Lab 15: Analysis of Vinegar
Lab 20: Characterizing Acidic and Basic Materials
Lab 1: Preparation and Properties of Gases in Air |
| 7. Community Pt 1  | Radioactive Isotopes; Types of radiation; Electromagnetic Spectrum; Bohr Model/Chemiluminescence; | Medical Imaging: Tc-99; PET, MRI, Medical use of Microwaves, UV & IR. CAT Scans, Fluoroscopy, Ionizing radiation. Kevlar, Breathalyzers, Tear Gas; Smoke grenades; Pepper Spray; Luminol; Latent fingerprint processing techniques. | Lab 6: Color and Light  
Lab 5: What Protects us from Ultraviolet Light? |
|-------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------|
Lab 25: Polymer Synthesis and Properties |
| Fire Station; Waste & Recycling |---------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------|
| 10. Industry - Electronic | Heavy metals | Coltan Mining; e-waste issues. |  |
| 11. Industry - Energy | Radioactivity revisited; photoelectric effect | Fossil fuels, (acid rain), Nuclear Energy, solar energy, wind energy. | Lab 21: Acid Rain |
| 12. From Nature to Doorstep | Spider Silk; gecko pads, snake venom; rubber | | |