Sample Syllabus
Chemistry 1346

Instructor:

Required Materials: The Poisoner’s Handbook, by Deborah Blum

Course Prerequisites:
The course uses Deborah Blum’s book about the development of forensic chemistry as a backdrop to discuss general chemical
principles. A laboratory component complements a non-traditional lecture-discussion group component with chemical
demonstrations. The course can be taken as a stand-alone course or as a sequel to 1345. CHEM 1345, 1346 cannot be used to
fulfill the 1441/1442 requirement in any degree program.

The course fosters conceptual understanding of the underlying principles of chemistry in three ways: traditional lecture
enhanced with meaningful demonstrations, small group project work within the “lecture” component and traditional and
guided inquiry based lab exercises. Both components will connect the learned principles with everyday experiences from
simple “drugstore chemistry” to implications in biological processes and modern forensic technology. The inquiry based lab
exercises are specifically designed to provide the students with a working understanding of the scientific method as compared
to a purely passive memorization.

The objectives will be assessed through communal assessment using signature assignments (this includes all sections of the
course)

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

   The signature assignment will be a guided inquiry laboratory experiment. In the lecture portion of the course, students discuss
   physical and chemical properties of different household chemicals and how to utilize them to identify the chemicals. Groups of
   2-3 students will then apply their knowledge to design an analysis scheme to identify 10 different “mystery powders”.

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

   The teams will design their analysis scheme as a homework assignment. A detailed description of their scheme will be assessed
   and revised by the lab supervisor. The team conducts the experiment according to their individual scheme, and they present
   their results, including a detailed discussion of error sources in their experiment, on whiteboards in front of their peers.
   Individual written reports will conclude the experiment.

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

   The inquiry base of the lab exercise necessitates extensive teamwork between the members of each lab team in different ways.
   Students need to find ways to communicate in self-determined settings and within a narrow time window:

   a) Outside the classroom during the design phase of the exercise (eg. through social media, meetings etc.).
   b) During the laboratory work itself: time management, assignment of tasks within the group and practical “hand-in-
      hand” work.
   c) Preparation of the final peer presentation: discussion of results, assignment of tasks within the group under time
      constraint.

4. Empirical & Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in
   informed conclusions.

   The students will learn to properly record and present their observations and conclusions in their peer presentation and in
   their final lab report.
Tentative lecture schedule:

<table>
<thead>
<tr>
<th>week #</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Introduction, The science of Chemistry</td>
</tr>
<tr>
<td>2</td>
<td>Chapter 1: Chloroform</td>
</tr>
<tr>
<td>3</td>
<td>Chapter 1: Chloroform and Chapter 2: Wood Alcohol</td>
</tr>
<tr>
<td>4</td>
<td>Chapter 2: Wood Alcohol</td>
</tr>
<tr>
<td>5-7</td>
<td>Chapter 3: Cyanides, Chapter 4: Arsenic, Chapter 5: Mercury</td>
</tr>
<tr>
<td>8-9</td>
<td>Chapter 6: Carbon Monoxide part 1</td>
</tr>
<tr>
<td>10</td>
<td>spring break</td>
</tr>
<tr>
<td>11</td>
<td>Chapter 7: Methyl Alcohol</td>
</tr>
<tr>
<td>12</td>
<td>Chapter 8: Radium</td>
</tr>
<tr>
<td>13</td>
<td>Chapter 9: Ethyl Alcohol</td>
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<tr>
<td>14</td>
<td>Chapter 10: Carbon Monoxide part 2</td>
</tr>
<tr>
<td>15</td>
<td>Chapter 11: Thallium</td>
</tr>
<tr>
<td>16</td>
<td>Epilogue</td>
</tr>
</tbody>
</table>

**Dropping the Course:** Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. Students will not be automatically dropped for non-attendance. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. Contact the Financial Aid Office for more information.

**Paperwork:** When dropping the course, you are responsible for seeing that all of the proper paperwork is completed and submitted to the appropriate university officials. If this paperwork is not completed, you will receive a letter grade corresponding to your earned grade, including zeros for all missed work.

**Grading:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Lab Average</td>
<td>40%</td>
</tr>
<tr>
<td>2 In class team projects</td>
<td>20%</td>
</tr>
<tr>
<td>2 one-hour exams</td>
<td>20%</td>
</tr>
<tr>
<td>Final research project</td>
<td>20%</td>
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</table>

Two one-hour exams will be given. The exams will not be multiple-choice, but in essay/work-out style. These exams will cover treading, lecture material and projects. The final project will be assigned 3 weeks before end of the course and is due on the last day of lecture.

**Total Numerical Grade**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>90 - 100</td>
<td>A</td>
</tr>
<tr>
<td>80 - 89</td>
<td>B</td>
</tr>
<tr>
<td>70 - 79</td>
<td>C</td>
</tr>
<tr>
<td>60 - 69</td>
<td>D</td>
</tr>
<tr>
<td>Below 60</td>
<td>F</td>
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**Cell Phones:** Please silence all cell phones prior to class. Texting during class is inappropriate and will not be tolerated.

**Electronic Communication Policy:** The University of Texas at Arlington has adopted the University “MavMail” address as the sole official means of communication with students. MavMail is used to remind students of important deadlines, advertise events and activities, and permit the University to conduct official transactions exclusively by electronic means. For example, important information concerning registration, financial aid, payment of bills, and graduation are now sent to students through the MavMail system. All students are assigned a MavMail account. **Students are responsible for checking their MavMail regularly.** Information about activating and using MavMail is available at [http://www.uta.edu/oit/email/](http://www.uta.edu/oit/email/). There is no additional charge to students for using this account, and it remains active even after they graduate from UT Arlington.

**Examination Needs:** You must bring the following to each examination:
• Scientific Calculator (You may not use a graphing calculator or a calculator capable of storing alphanumeric/textual material.)
• No. 2 pencils with eraser
• UTA Student ID Card or other valid Government-issued photo ID
• Students are not allowed to have access to cell phones or digital pagers during any exam.

**Course Goals:** Upon completing the course, the student should
• understand fundamental chemical concepts
• be able to understand and apply the scientific method
• discuss and present fundamental qualitative observations
• understand basic acquisition and manipulation of quantitative data.

**SOAR Cost Share Tutoring:** SOAR (Students Obtaining Academic Readiness) is located in 132 Hammond Hall and offers free academic support for qualifying students and low-cost services for all students, including Cost Share Tutoring.

**Strategies for Succeeding in Chemistry 1345:**
1. Attend every lecture. In class projects and discussion will be the foundation for your success.
2. Prior to class, read the assigned paragraphs in the book.
3. Review your lecture/project notes after each class. Correct obvious errors and note topics which require further study or clarification.
4. Form a discussion group. Discussing the concepts we cover in class with others greatly helps with your understanding. Be able to communicate with each other on short notice, not just before class.

**Grade Replacement Policy and Taking the Course Pass/Fail:**
Students enrolling in this course with the intention of replacing a previous grade earned in the same course must declare their intention to do so with the registrar no later than Census Date. Please consult the Undergraduate Catalog for university policy regarding grade replacement.

If P or F is a grade option in this class and you intend to take this class for a pass/fail grade instead of a letter grade, you must inform the instructor, through the necessary paperwork, of your intentions before the census date (June 20th). Please consult the Undergraduate Catalog for the university policy regarding taking a course pass/fail.

**Academic Dishonesty:** All students are expected to pursue their scholastic careers with honesty and integrity, and the Department of Chemistry and Biochemistry will not tolerate academic dishonesty in any form. “Scholastic dishonesty includes but is not limited to: cheating, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.” (Regents’ Rules and Regulations, Part One, Chapter VI, Section 3, subsection 3.2, Subdivision 3.22)

**Examples of academic dishonesty include:**
• exchanging answers or information during a test or quiz
• looking at another student’s paper during a test or quiz
• bringing notes in any form into the test or quiz, including written notes (crib sheets), digitally stored information (including formulas, constants, alpha-numeric material or text), or notes stored in any other medium
• looking at a book or other unauthorized source during the quiz or test

During tests or quizzes, students are not allowed to use any hand-held calculators or computers which possess the capability of storing alpha-numeric or textual material. If the instructor allows the use of calculators on a particular test, then students may only use scientific calculators which are non-programmable. In addition, students are not allowed to have access to cell phones or digital pagers during any test or quiz. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the University. Since dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced.

**Americans with Disabilities Act:**
The University of Texas at Arlington is committed to the spirit and letter of federal equal opportunity legislation. The Americans with Disabilities Act (ADA) provides those with disabilities with the same opportunities as all citizens. If you require an accommodation based on disability, I would be happy to meet with you in the privacy of my office, during the first week of the semester, to make sure you are appropriately accommodated.

**Bomb Threats:** In the event of a bomb threat to a specific facility, University Police will evaluate the threat. If required, exams may be moved to an alternate location, but exams will not be postponed. UT-Arlington will prosecute those phoning in bomb threats to the fullest extent of the law.
Signature assignment: Mystery Powder Lab Instructions

Assignment: using the Lab Checklist as a guide, write a lab report for the Mystery Powder lab activity.

Important information:

Take very small scoop of powders, not heaping. Do not mix used eyedroppers, this will invalidate your results and your classmates' results!
Do not mix scoopers; they are labeled and should stay with “stock” powder. Be respectful of other people's workspace, be polite and patient please.
Make sure you have recorded the order of your powders in the reaction plate and stick to it!

PLEASE clean your work area when finished, this is MANDATORY.

When performing acid, iodine and burn test: exercise all lab safety procedures; goggles at all times, be aware of others working around you, hair and loose clothing tied back, no horseplay.

Anyone who chooses to disregard safety measures will not be allowed to continue lab.

Mystery Powder Lab

Question: can an unknown compound be identified by determining its physical and chemical properties?

Hypothesis: every pure compound has unique chemical and physical properties, therefore it is possible to identify an unknown compound if you determine these properties. Controlled variables: examples: temperature of water added, time (for reactions to take place), use same pH paper for all powders. Can you think of any more variables?

Manipulated variables: the tests performed (chemicals added, procedures applied). Responding variables: reactions of the powders to the tests.

Procedures: for each test, place small scoop of known powder in well. Make a note of any changes to procedures that you made.

Observation: record color, texture, appearance of each powder, DO NOT TASTE. Look at it under the magnifying glass.

Water Test: place 2-3 drops of water (or as needed to cover powder) in each well containing known powders. Stir with toothpick. Observe and record appearance. Don't throw away; use for pH test.

PH Test: dip pH strip into fluid from the Water Test. Record initial color change. Throw away test strips when done. Clean and dry reaction plate. Refill with powders.

Acid Test: place 2-3 drops of dilute acid in each well containing known powders. Record appearance; color change, bubbles, etc. Clean and dry reaction plate. Refill with powders.

Iodine Test: place 2-3 drops of iodine in each well containing known powders. Record appearance. Clean and dry reaction plate. Refill with powders.

Flame Test: Make a foil spoon and place powder on it. With tongs, put in Bunsen burner flame. If it begins to smoke remove from flame immediately!! Record results.

Get Mystery powder from teacher and perform all of the above tests on it to identify your unknown.