

**CHEM 121: Chemical Principles II with Inorganic Chemistry**  
**Abridged Syllabus**  
**Spring 2006**

**Instructor**

James McCormick

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**Office Hours**

As posted, by appointment or whenever my door is open.

**Lecture**

Monday, Tuesday, Thursday and Friday, 14:30 – 15:20, Magruder 2090

**Laboratory**

Wednesday, 08:30 – 11:20, Magruder 1023

Wednesday, 14:30 – 17:20, Magruder 1023

Laboratory will not meet during the first week of class. Consult the class schedule (at the end of this syllabus) and the class web page for information on what exercises will be done and on what days.

**Required Materials**

*Textbook* Zumdahl, S. S. *Chemical Principles, 4<sup>th</sup> Ed.*; Houghton-Mifflin: New York; 2002. A study guide, solutions manual and CD-ROM are also available and are recommended.

*Laboratory Manual* The laboratory manual for CHEM 121 is available on-line at <http://chemlab.truman.edu/ChemicalPrinciples.htm>. You may print out any, or all, of the pages that you wish. However, you will not be allowed to bring a copy of the *Experimental Procedure* with you to lab; you must have it in your notebook.

*Laboratory Notebook* A bound laboratory notebook capable of creating duplicate pages is required of all students. Regular spiral-bound notebooks are unacceptable as laboratory notebooks. See the Laboratory Notebook page of the ChemLab web page (<http://chemlab.truman.edu/>) for more information on the laboratory notebook. Note that for this course you do not need to prepare a *Background* section for each exercise.

*Safety Equipment* All students must purchase safety goggles that meet the ANSI Z87 or Z87.1 safety standard. Safety goggles and proper attire are to be worn at all times in the laboratory; inappropriately attired people will not be allowed in lab. See Chemistry's Laboratory Safety page ([http://chemlab.truman.edu/Safety\\_Files/LabSafety.htm](http://chemlab.truman.edu/Safety_Files/LabSafety.htm)) for more information on safety in the chemical laboratory.

*Calculator* A hand-held, non-programmable scientific calculator (can perform logarithms, scientific notation and exponentials) is required. In general if the display is less than 2 cm high, the calculator is acceptable. If you are in doubt, ask. Be sure that you can enter numbers in scientific notation, raise numbers to powers (not the same as scientific notation),

take roots, and take the logarithms and the antilogarithms (both base 10 and natural) of numbers. Review these topics by reading Appendix 1 sections 1.1 through 1.4 in the text. Ask me, if you have any questions. Bring your calculator to all class meetings. No loaner calculators will be available!

*Computers* You are expected to have general computer skills with a working knowledge of a web browser (Netscape<sup>®</sup> or Internet Explorer<sup>®</sup>), a word processing package (Word<sup>®</sup>) and a spreadsheet (Excel<sup>®</sup>).

A course web page (<http://www2.truman.edu/~jmccormi/Chem121/Chem121.htm>) is available (not on the CourseInfo system). There you will find all class information and useful links.

### **Course Objectives**

To provide a foundation in the fundamental models and concepts of chemistry for further study in chemistry, biology, agriculture, health sciences and other fields.

To begin to establish good laboratory technique, observational skills and laboratory record keeping.

To familiarize the student with the language of chemistry as it is spoken by practicing professionals in the field and relate this to “real-world” problems, whenever possible.

### **Course Requirements**

The information given below is specific to this course. Please see my general syllabus (<http://www2.truman.edu/~jmccormi/GeneralSyllabus.htm>) for information on my policies regarding: Students with Disabilities, Attendance, Make-Ups, Promptness, Late Penalties, Extra Credit, FERPA, Academic Honesty and Unnecessary Equipment. You will also find there more information on my Grading Scale and the answer to the question “Is It Going to be on the Test?”

*Chapters Covered in the Text* You are expected to gain an understanding of, and be able to apply, the basic chemical principles and models covered in Chapters 12 through 14 and 16 through 22.

*Pre-Exam Exercises* No later than a week before an exam a pre-exam exercise will be provided to you. This exercise will consist of approximately five questions drawn from the same material that the exam will cover. Other possible questions include ones that expand on the material and those which review previous topics. These exercises will be due in class on the day of the exam. You may use the book as a resource, but you may not collaborate with any student on working these problems. You are permitted to ask other faculty and the AXE peer tutors for general help on a topic, but not on a specific question from the exercise.

*Exams* There are three in-class exams. An exam will usually consist of short answer questions (no more than about 20%) and longer “word problems”. The best students will find the exams challenging; unprepared students will find the exams impossible.

*Post-Exam Exercises* You will be able to earn back a fraction of the points that you missed on an exam by turning in the correct answers for certain problems from the exam. Note that a question may differ slightly between the exam and the post-exam; take care how you answer a question. Additional information concerning the post-exam exercises may be found at <http://www2.truman.edu/~jmccormi/Chem121/Keys/PostExam.htm>.

*Final Exam* The final will be given on Thursday, May, 11 in Magruder 2090 from 13:30-15:20. The final exam will be developed by the CHEM 121 instructors and will be given to all CHEM 121 sections. It will consist of a multiple-choice section, a short-answer section and a section of worked word problems. How the raw score on the final will translate into the final grade will be determined by the CHEM 121 instructors at the end of the semester.

*Quizzes* A 10-point quiz will be given in the last 15 minutes of class on Friday, except when there is an exam, or where otherwise noted in the syllabus. The quiz problems will be taken primarily from the chapter under discussion, but they may include older material and they may not require a numerical solution. A week before a quiz you will be assigned five questions from the textbook. Your answers must be written on one side of a clean piece of paper with your name at the top of each sheet. One of these questions will be selected to become part of the quiz and must be turned in with the quiz for credit. The first quiz will be January 27.

*Laboratory* The laboratory grade will be based on your laboratory notebook and laboratory quizzes. The grading scheme for the laboratory is given on the class web page. However, it is impossible to receive a passing grade in this course by completing less than 80% of the scheduled exercises, or by only completing the exercises, and not doing, or doing poorly on, the notebook and/or the laboratory quizzes.

At the start of each laboratory session you are required to show me your notebook with that week's exercise prepared as described on the "What You need to do Before Coming to Laboratory" web page ([http://chemlab.truman.edu/Notebook\\_Files/BeforeLab.htm](http://chemlab.truman.edu/Notebook_Files/BeforeLab.htm)). For CHEM 121 you do not need to prepare a *Background* section for your laboratory exercises. I will be looking for and assessing your *Statement of Purpose*, your *Procedural Outline*, and your notebook's formatting. I will then sign and date your notebook. Note that in CHEM 120 I, for the most part, only looked to see if these items were present; in CHEM 121 I will assess the quality of these items also.

Several times during the semester you will be asked to turn in all of the duplicate notebook pages for the last completed exercise for grading.

If you are not asked for the notebook pages, then there will be a ten-minute open-notebook quiz at the start of laboratory over the last completed exercise. A lab quiz will ask for information that you should have written in your notebook (such as the result of a calculation, a graph, or the color of a solution), or for parts of your notebook. It will not require any calculations or a great deal of writing. A well-kept notebook is essential to performing well on the lab quizzes.

Whether the notebook will be turned in, or a quiz will be given, will not be announced beforehand. The instructor reserves the right to give a quiz to one laboratory section and

grade the notebook of the other. No make-up laboratory quizzes will be given and no extra time will be allowed to complete a quiz.

*Homework* It is expected that you will work all of the end-of-chapter problems labeled “Exercises” and “Additional Exercises” with the blue numbers (answers for these problems are in the back of the book). You must be able to do any of these problems in six minutes, or less, without looking back in the text for help. You are also to do the blue-numbered problems labeled “Challenge Problems”, and you should be able to work these in about ten minutes. The quizzes and exams will draw heavily from the “Exercises” and each exam will include at least one question similar to the “Challenge Problems”. See the class web page (<http://www2.truman.edu/~jmccormi/Chem121/Chem121HmWrk.htm>) for more assistance on making the most of your homework.

### Grading

Your average score, as a percentage of the total points possible, for all assessments will be normalized to the point totals shown below.

<u>Source</u>	<u>Points</u>
Exams	200
Pre-Exam Exercises	200
Quizzes	200
Final Exam	200
Laboratory	200
<hr/> Total	1000

Assuming an average of 700 points and a standard deviation ( $\sigma$ ) of 100, the grading scheme shown below will be used to determine the final letter grade for the course. If the actual average is significantly different than 700, the grading scale may be adjusted at the instructor’s discretion. Historically, the average for this course has been in the 780-820 range, and most students earn a B or C.

<u>Grade</u>	<u>Total Points Earned</u>	<u>Cut-off</u>
A	> 900	average + $2\sigma$
B	800 – 899	average + $\sigma$
C	700 – 799	average
D	600 – 699	average - $\sigma$
F	< 600	

A student whose grade is below a cut-off by 20 points or less will be considered for the next higher grade. The criteria for promotion include final exam score, a student’s class participation, a general increase in quiz and/or exam grades over the semester, laboratory citizenship, and attitude (in that order).