

**CHM 101A Syllabus**  
Fall 2006  
9:15 – 10:30 am TTh PS H-150

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*Course Description*

Welcome to Chemistry 101 at Arizona State University. Chemistry 101 is an introduction to chemistry covering chapters 1-13 in *A Conceptual Introduction to Chemistry* by Bauer, Birk, and Marks. This course will cover the nature of atoms and elemental substances, the combination of atoms to form molecules and compounds, the interactions between atoms and molecules, chemical bonding models, relationships between chemical and physical properties, solutions, and a brief overview of energy, kinetics, equilibrium, and acids and bases. The class schedule shows the organization of the course. There will be an emphasis on conceptual understanding at both the macroscopic level and the molecular level.

The study of chemistry can be an exciting and rewarding experience when there is a joint effort among the students and the instructors to improve learning. Learning chemistry can be a challenge – you are confronted with a new language (terminology and symbolism) and you must synthesize new ideas while integrating your previous understanding of math and science. Success is a matter of exposure and practice. Learn to use your text properly by staying half a chapter ahead of your instructor and re-reading sections that you find confusing. After class meetings, read the pertinent sections again. It may take several readings to understand the material.

<i>Line Number</i>	<i>Section</i>	<i>Recitation</i>	<i>Lab</i>
99667	AA	12:40-1:30 M PS H-330	1:30-3:30 M PS H-334
61234	AB	2:40-3:30 M PS H-330	3:30-5:30 M PS H-334
41102	AC	12:40-1:30 T PS H-330	1:30-3:30 T PS H-334
49917	AD	2:40-3:30 T PS A-107	3:30-5:30 T PS H-334
54779	AE	12:40-1:30 W PS H-330	1:30-3:30 W PS H-334
44958	AF	2:40-3:30 W PS H-330	3:30-5:30 W PS H-334
49493	AG	12:40-1:30 Th PS H-331	1:30-3:30 Th PS H-334
63720	AH	2:40-3:30 Th PS H-331	3:30-5:30 Th PS H-334

*Textbooks*

*Required:*

***A Conceptual Introductory to Chemistry***, Bauer, Birk and Marks, McGraw-Hill  
***Laboratory Inquiry in Chemistry, 2<sup>nd</sup> ed.***, Bauer, Birk, & Sawyer, 2005, Brooks/Cole

*Optional:*

***Student Solutions Manual to Accompany A Conceptual Introduction to Chemistry***

*Required:* A duplicating carbonless notebook and splash-proof goggles for lab

PowerPoint Presentation Notes will be available on-line. Bring these to class with you.

*Calculator:* A good calculator capable of basic math and exponential functions will be needed for homework, quizzes and exams. Bring a calculator to all lectures and lab sessions.

## Course Grading

Hour Exams (4)	400 points
Final Exam	200
Lab	150
Quizzes	150

- *Midterm Exams:* Four 100-point exams will be given during the regular semester. Because the course content builds through the semester, you can expect each exam to be somewhat cumulative in nature. No exams will be dropped nor will there be make-up exams. (See *missed exams*.)
- *Final Exam:* Your final exam will be worth 200 points. If your final exam score, based on 100 points, is better than one of your earlier exams, the lowest exam score will be replaced with the percentage score on your final exam grade.
- *Missed Exams:* None of the graded exams will be dropped. Therefore, it is imperative that you be present for every exam, and plan travel and other events accordingly. **An alternate exam may be administered prior to the scheduled time only in cases where travel for university-sanctioned business or function, which cannot be rescheduled, interferes with an exam date.** *If such plans do interfere with an exam date, then it is your responsibility to schedule an alternate exam date prior to the scheduled date. This alternate date must be finalized at least two weeks prior to the scheduled exam date.* You must show documentation from the appropriate university official for an early exam to be administered. An alternate exam will not be administered after the original exam date. In cases of sudden illness or unanticipated emergency that prevents you from attending a scheduled exam, the final exam percentage will be substituted. *This option can only be exercised once. A second missed exam will be scored as a zero.* Because all exam dates are scheduled at the beginning of the semester, personal travel, work schedules, traffic, etc. do not constitute grounds for a make-up exam.
- *Quizzes:*
  - Discussion quizzes will be given during the discussion period during most weeks, at the discretion of the teaching assistants. Discussion quizzes will typically cover material from the previous week's lectures but may also include questions related to the laboratory. Discussion quizzes will be graded on a 10-point scale and will be worth two-thirds of the total quiz grade.
  - Quizzes may also be given in the lecture. Lecture quizzes will not be announced and will be given during lecture at least once a week. Quizzes given in lecture may consist of individual or group quizzes. Because quiz assignments may vary, it is in your best interest to attend every class. In-class quizzes will be graded on a 5-point scale and will be worth one-third of the total quiz grade.
  - There will be no make-up quizzes. If you miss a quiz you will earn a zero on that quiz unless you can provide a reasonable excuse for your absence.
- You are expected to write formal lab reports as described on pages four and five of your lab manual. Your reports must be typed and grammatically correct. The report will be graded on discussion of relevant chemistry, thoroughness, grammar, and style.

## Course Grade Assignments (No Curve)

Grade average	≥ 88	A
	≥ 76	B
	≥ 64	C
	≥ 52	D
	< 52	E

**CHM 101 A**  
**TENTATIVE LECTURE SCHEDULE**  
**Fall 2006**  
**J. Birk**

	<b>Date</b>	<b>Chapter</b>	<b>Topic</b>
T	8/22	1	Introduction; Start Chapter 1
Th	8/24	1	Matter and Energy
T	8/29	2	Atoms, Ions, and the Periodic Table
Th	8/31		
T	9/5	3	Chemical Compounds
Th	9/5		
T	9/12		<b>Exam 1 (Chapters 1-3)</b>
Th	9/14	4	Chemical Composition
T	9/19		
Th	9/21	5	Chemical Reactions and Equations
T	9/26		
Th	9/28		Complete Chapter 5, Start Chapter 6
T	10/3	6	Quantities in Chemical Reactions
Th	10/5		
T	10/10		<b>Exam 2 (Chapters 4-6); Start Chapter 7</b>
Th	10/12	7	Electron Structure of the Atom
T	10/17		Complete Chapter 7, Start Chapter 8
Th	10/19	8	Chemical Bonding
T	10/24		
Th	10/26		
T	10/31	9	The Gaseous State
Th	11/2		<b>Exam 3 (Chapters 7-9)</b>
T	11/7	10	The Liquid and Solid States
Th	11/9		
T	11/14	11	Solutions
Th	11/16		Complete Chapter 11; Start Chapter 12
T	11/21	12	Reaction Rates and Chemical Equilibrium
Th	11/23		Thanksgiving Holiday
T	11/28	13	Acids and Bases
Th	11/30		
T	12/5		<b>Exam 4 (Chapters 10-13)</b>

**FINAL EXAM SCHEDULE:**

**Th Dec 7 CHM 101 A FINAL EXAM at 7:40-9:30 am**

*Ungraded (but important) coursework*

To prepare for quizzes and exams, you need to practice. Textbook homework problems are listed in this syllabus, and may be updated if necessary. The purpose of these assignments is to allow you to practice the kinds of questions that will help you gauge your understanding of the material and to prepare you for quizzes and exams. These assignments will not be graded, but most solutions are provided in Appendix D at the end of your textbook. It is in your interest to do these assignments since they help build knowledge necessary to do well on exams. Stay up-to date on homework. It is difficult to catch up if you get behind.

*Website*

My website can be found at <http://www.public.asu.edu/~jpbirk/>.

Click on Courses, then on CHM-101 to find materials related to this course. Copies of class notes will be

available there as pdf files that you can print and/or download. It is recommended that you bring copies of these class notes to lecture with you.

### *Sources of Help*

In addition to my office hours, the TAs have office hours in the Learning Resource Center (LRC) located in PSH-137. The LRC is staffed Monday through Thursday from 8:30 a.m. to 9:30 p.m., and Friday from 8:30 a.m. to 4:30 p.m. Teaching assistants and LRC staff members can be a valuable resource.

### *Withdrawing from the Course*

The withdrawal deadline is Friday, October 27 (in person), and October 29 if done through ASU Interactive/Sun Dial. If you withdraw from the course, please inform your lab group so remaining members can make accommodations for your departure. The deadline for complete withdrawal from all courses is December 5.

### *Attendance*

Attendance at scheduled class lectures is essential and expected. Do not expect to consistently miss class and still do well. Timeliness to class is expected. Remember to turn off your pager or cellular phone prior to coming to class.

### *Academic integrity*

Cheating will absolutely not be tolerated. The first such infraction will be dealt with to the fullest extent permissible by the university. There are no exceptions. This includes (but is not limited to) any form of inter-student collaboration on exams or external assignments that is not specifically sanctioned by the professor, use of prohibited materials or devices during exams, copying or distribution of quiz or exam answers prior to the test, and plagiarism. Cheating also includes putting a student's name on a paper to which that person did not contribute (quizzes, lab reports, etc.).

### *Changes in Syllabus*

Any changes in the syllabus and details of exam content will be announced in lecture.

### *Teaching Teams Program*

The Teaching Teams Program at ASU was developed by the University Learning Resources Center and the Chemistry Department to help students master difficult courses. To be involved in the program, a student can either apply to be Team Leader or they can participate by attending Directed-Study Sessions on a regular basis. We are hoping that a student from each lab group volunteers to be a Team Leader this year.

- Team Leaders register for a 2 credit leadership seminar geared for training students to run Directed-Study Sessions. During weekly Directed-Study Sessions, Team Leaders meet with students to work on problems they'll get from the instructors. Also, Team Leaders will work with Chemistry and LRC staff to stay on top of lecture and lab content. Team leaders in past semesters averaged course GPA of 3.75 or better. In addition to doing well in the course, Team Leaders reported learning many other skills they thought would help them in future classes and in career decisions.
- Student participants are responsible for doing the normal assigned reading and problems. By attending Directed-Study Sessions on a regular basis, participants stay on top of the material and do better on quizzes and exams.

Applications are available at [www.asu.edu/lrc/teachingteams](http://www.asu.edu/lrc/teachingteams) or you can apply during your discussion session during the first week of class.

**CHM 101**  
**Suggested End-of-Chapter Questions and Problems**  
**A Conceptual Introduction to Chemistry; Bauer, Birk, and Marks, 1<sup>st</sup> Edition**

Following is a list of problems at the end of each chapter that I suggest you work. If a given section of the textbook is not covered in class, an announcement will be made that this material is not included on an examination; the corresponding exercises can then also be omitted. If you need more practice with a particular skill or concept, I suggest trying the corresponding even-numbered problem. You should also do the in-chapter examples and practice problems as you're reading the chapter.

Answers to the odd-numbered end-of-chapter questions and problems can be found in Appendix D. Answers to the in-chapter practice problems are given in Appendix C.

Chapter	End-of-Chapter Questions and Problems
1	1, 2, 9, 13, 15, 19, 21, 25, 27, 29, 31, 35, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 81, 85, 87
2	1, 2, 9, 11, 13, 15, 17, 19, 21, 23, 27, 29, 33, 35, 37, 39, 41, 43, 45, 47, 49, 55, 59, 63, 65, 67, 71, 73, 75, 77, 79, 81, 83, 87, 91, 93, 95, 97, 111, 113, 115
3	1, 2, 3, 5, 7, 9, 11, 13, 15, 17, 19, 25, 29, 31, 33, 37, 39, 41, 43, 45, 47, 49, 53, 55, 59, 61, 63, 65, 67, 73, 75, 89, 93,
4	1, 2, 3, 5, 9, 11, 13, 15, 17, 19, 25, 27, 29, 31, 33, 35, 37, 39, 41, 45, 47, 49, 51, 53, 55, 57, 59, 61, 67, 69, 71, 73, 75, 77, 81, 83, 85, 87, 89, 91, 93
5	1, 2, 3, 5, 7, 11, 13, 23, 27, 29, 31, 33, 37, 39, 41, 45, 47, 49, 51, 57, 59(a,c), 61, 65, 67, 69, 71, 75, 77, 79, 81, 87 (a,d), 91, 95, 99, 101, 103, 105
6	1, 2, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 51, 55, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 81, 85, 87, 89, 91
7	1, 2, 5, 7, 9, 15, 17, 21, 23, 27, 29, 31, 33, 37, 39, 41, 43, 45, 47, 51, 53, 57, 59, 63, 65, 73, 75, 81, 83, 87, 99, 101, 103, 105
8	1, 2, 5, 7, 9, 11, 15, 21, 23, 25, 29, 33, 49(b,c,d), 53, 55, 57, 59, 61, 63, 73, 85, 89, 91, 93, 97, 99, 101, 109, 113, 115
9	1, 2, 5, 7, 9, 13, 15(a,b,c), 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 37, 55, 56, 57, 59, 61, 63, 67, 69, 71, 73, 75, 91, 93, 95, 101, 103
10	1, 2, 5, 7, 9, 11, 15, 17, 19, 21, 23, 25, 27, 37, 39, 41, 43, 45, 47, 49, 55, 57, 59, 63, 65, 67, 69, 73, 79, 81, 111, 113
11	1, 2, 5, 7, 11, 15, 17, 19, 21, 27, 33, 35, 37, 39, 41, 43, 45, 49, 51, 67,
12	1, 2, 3, 7, 11, 19, 21, 29, 35, 39, 41, 49, 51, 55, 57, 61, 63, 73, 79, 85, 89, 91, 93, 97, 101, 109
13	1, 2, 11, 13, 15, 23, 27, 31, 33, 43, 45, 47, 49, 51, 53, 55, 61, 63, 67, 71, 75

**Errors** found in Bauer, Birk, Marks – *A Conceptual Introduction to Chemistry*, 1<sup>st</sup> Edition

- p. 149 Ch. 4. EOC Question 4.50: "The following molecules" should be "The following substances" since all are not molecular substances.
- p. 199 Ch. 6 Example 6.1 In the solution, C<sub>3</sub>H<sub>8</sub> should be changed to CO<sub>2</sub> the first two times in the text and the in both roadmaps (a total of four times). Also, CO<sub>2</sub> should be changed to H<sub>2</sub>O the first two times in the text and the in both roadmaps (a total of four times).
- p. 205 Ch. 6. Fig. 6.8c: There should be only two unused solar panels, not three. Delete one.
- p. 228 Ch.6 Question 6.1(d) The definition provided for **specific heat** should be for one gram of "a substance" not "water."
- p. 230 Ch. 6 Question 6.32. Should say that "each bag should have 2 pieces of bubble gum" (not packs, to be consistent with the rest of question).
- p. 240 Ch. 7 Fig. 7.6. Ultraviolet is misspelled -- missing the first l.
- p. 252 Ch. 7. Ch.7 Text Fig in center of p.252: In the orbital diagram for C, the 2s label above the set of three boxes (orbitals) should be a 2p.
- p. 285 Ch.8 Example 8.2(d) solution: Electronegativities do not match those in Fig. 8.5. The values in the example should be changed: Change 2.5 to 2.6 and 2.1 to 2.2.
- p. 334 Ch. 9 Figure 9.19. In "volume ratios of reactants and products is the same," **is** should be **are**.
- p. 347 Ch. 9 Second paragraph on p. 347: first occurrence of "known" should be "know."
- p. 381 10.2 Figure 10.20 p. 381. The label H<sub>2</sub>Sc should be H<sub>2</sub>Se.
- p. A-6 Ch. 6. Practice Problem 6.13 answer is incorrect. Correct answer is (a) endothermic (b) 133 kJ.
- p A-6 Ch. 5. Practice Problem 5.7 answer: There should NOT be a coefficient of 2 before N<sub>2</sub>.
- p. A-6 Ch. 7 Practice Problem 7.3. Answer is red line, but wavelength given in figure is 656 nm, not 657 nm.
- p. A-6 Ch. 8 Solution to Practice Problem 8.12 p. 309 omits "CO<sub>2</sub>; nonpolar molecule." .
- p. A-14 Ch. 5. EOC Question 5.29 Answer: The balanced equation given does not have simplest coefficients. They should be divided by 2: N<sub>2</sub>(g) + 3Cl<sub>2</sub>(g) → 2NCl<sub>3</sub>(g)
- p. A-14 Ch. 5 Question 5.77. CaS(s) should be CaS(aq).
- p. A-15 Ch. 6 Question 6.11(c) answer should be 2.9 mol O<sub>2</sub> not 2.9 mol C<sub>6</sub>H<sub>6</sub>.
- p. A-21 Ch. 9. Question 9.71(c): Answer should be 8.06 g, not 8.07 g.
- p. A-21 Ch. 10 End of chapter problems 10.1(letter l) the answer should be "normal freezing point" because the condition of 1 atm is stated.
- p. G-4 Glossary Error (header G should be I)

**CHM 101 Laboratory Syllabus**  
**Fall 2006**  
**Dr. Ron Briggs**

**DATES**

MON	TUE	WED	THU	INVESTIGATION	
8/21	8/22	8/23	8/24	1	What Are the Safety Concerns in the Lab? Check into lab
				2	What's in the Flask? (Part 1)
8/28	8/29	8/30	8/31	7*	Is the Water Hard or Soft?
9/11	9/5	9/6	9/7	H/O	How Are Patterns Organized? (Handout)
9/18	9/12	9/13	9/14	14*	Who Wrote the Ransom Note?
9/25	9/19	9/20	9/21	17*	How Much Cobalt Is in the Soil?
10/2	9/26	9/27	9/28	5*	What's In the Bottles?
10/9	10/3	10/4	10/5	13*	What is a Copper Cycle?
10/16	10/10	10/11	10/12		(continued)
10/23	10/17	10/18	10/19	8*	How Hot is the Water?
10/30	10/24	10/25	10/26	24*	Are Pollutant Gases Harmful to Plant Life?
11/6	10/31	11/1	11/2		(continued)
11/13	11/7	11/8	11/9	34*	What Factors Affect Chemical Equilibrium?
11/20	11/14	11/15	11/16	37*	What Is the pH of Soil?
11/27	11/28	11/29	11/30		Presentations/Posters (See p. 215 in the lab manual); Lab cleanup

*Investigation numbers designated with a \* are presentation/poster session choices.*

In addition to the normal lecture periods each week, you have enrolled in a discussion/laboratory section that consists of a 50-minute discussion section (used for administering quizzes and for discussion of lecture and lab material) that is immediately followed by 1 hour and 50 minutes of lab time. Your TA is responsible for these periods. Your final grade in the lab will be based on several factors including attendance, class participation, contribution to group activities, successful completion of the experiments, submission of the laboratory reports, laboratory notebook, and complying with safety rules. You must attend every discussion and lab session: **Three or more absences may result in an automatic failure in this course--regardless of your final grade.** If you must miss a lab for an excusable reason, written verification of the absence is required. Absences will only be excused for the following reasons: (1) There is a serious illness or death in your family; (2) You are ill enough to see a physician; or (3) You travel for an official, university sponsored function that requires your attendance; e.g. you're on the swim team.

**Required Materials (in addition to your lecture textbook):**

- 1) *Laboratory Inquiry in Chemistry*, 2<sup>nd</sup> Ed. Bauer, Birk, & Sawyer, 2005, Brooks/Cole
- 2) A bound, carbonless lab notebook for each student
  - *the smaller, 50 page notebook is acceptable for this course, or you may continue to use your notebook from a previous semester. You must obtain a notebook capable of creating duplicate pages. The recommended carbonless lab notebook is being sold by AXΣ in the foyer of PS H-Wing (across from the elevators). This notebook will serve as your laboratory record of procedures, observations, calculations, and results. Your TA will inspect your laboratory notebook throughout the semester.*
- 3) Splash-proof Safety Goggles (available in bookstore or from SAACS)
  - *Goggles must be worn in the laboratory at all times. Failure to abide by safety rules can result in your expulsion from the class.*

**Lab Grading**

Your lab grade will be assigned as follows:

- 10 points per lab report
- 20 points for the presentation/poster session
- 10 points for TA evaluation
- 10 points for lab notebook

\*Your final lab total will be weighted to the appropriate number of points determined by your course instructor. At the beginning of the semester, you will be assigned to a group within which you will complete the lab investigations and write some of your lab reports. Each member of the group is required to make an equal contribution to efforts for which you will receive credit. Your group is responsible for resolving issues of unequal contributions. If you are unable to do so, inform your teaching assistant or the lab coordinator. Lab grades will be adjusted according to efforts contributed by each group member. Part of working in a lab environment is learning to work with new people that may do things differently than you. Your lab group will be chosen carefully by the lab coordinator and will not be changed for trivial reasons. Please do not complain to your TA or instructor about your group members unless you are unable to come to an understanding on your own. A simple discussion is usually sufficient to resolve most issues.

Your lab group will be expected to write formal lab reports for each investigation as described on pages four and five of your lab manual. These reports must be typed and grammatically correct. The report will be graded on discussion of relevant chemistry, thoroughness, grammar, and style at the discretion of you TA. In addition, you will be assigned grades based on your conduct in the lab and a presentation/poster session at the end of the semester. Your TA will discuss this portion of your grade in more detail.

Completed laboratory reports are due by 4.30 p.m. two working days after you complete the laboratory work. However, if during the semester your usual laboratory due date falls on the day of an exam, you have an additional working day to complete the work. If you submit a report deemed unacceptable, your lab instructor will allow you to rewrite it. Your report will be graded according to the scheme shown below.

