Chemistry 110 – Chemical Principles

(3 Credits)
Altoona College, The Pennsylvania State University
Syllabus – Spring 2010
Dr. Richard Bell

Office: 104 Science Building		**Mail Box:** In 107 Science Building
Telephone: 949-5172		**Staff Assistant:** Leisha Ott
Web Page: http://www.personal.psu.edu/rcb155		(107 Science Building)
Email: rcb155@psu.edu		**Office Hours:** 1:00-2:15 pm Monday
		10:30-11:45 am Friday
Classroom: 117 Science Bldg.		*By Appointment
(Monday, Wednesday, and Friday 12:00-12:50 am)		
Recitation:	Section 5 → 133 Hawthorn (Wednesday 8:00-8:50 am)	
	Section 6 → 133 Hawthorn (Wednesday 9:00-9:50 am)	
	Section 7 → 209 Force (Wednesday 10:00-10:50 am)	
	Section 8 → 129 Eiche (Wednesday 5:00-5:50 pm)	

Course Outline: CHEM 110 is the first semester of a two-semester introductory general chemistry course designed for science, engineering, and technology majors. This course will introduce you to the basic principles of chemistry with an emphasis on the relationships between the microscopic structure and macroscopic properties of matter. The principles are illustrated with a wide variety of examples from the sciences, engineering and technology, and everyday life. You will be introduced to a variety of topics for which you will be expected to gain a general understanding and be able to make qualitative, as well as, quantitative determinations (using simple algebraic methods) in areas such as: matter and measurement, molecules and molecular compounds, ions and ionic compounds, types of chemical reaction, manipulation of chemical equations, atomic and molecular weights, the periodic table and periodic properties of the elements, nomenclature, aqueous reactions and solution stoichiometry, thermochemistry, electronic structure of atoms, chemical bonding, molecular geometry, the states of matter, properties of solutions, and real world applications. This course may be supplemented with a laboratory (CHEM 111), and though scheduled separately, should be taken during the same semester.

Textbook: General Chemistry, 9th edition, D.D. Ebbing & S.D. Gammon, Houghton-Mifflin Company, Boston, MA (2009) ISBN: 9780618857487.

Office Hours: I will hold office hours in my office (104 Science) on Mondays from 1:00-2:15 pm and Fridays from 10:30-11:45 pm. If you are unable to attend during these times, call, email or talk to me before or after class to schedule an appointment. In-class announcements will be made when office hours are changed due to schedule conflicts.

Contact Information: Please feel free to contact me by phone (949-5172), mail or email (rcb155@psu.edu) to discuss a problem or set up an appointment. When leaving a message, please be sure to include your name, number and brief message. You may also drop a note in my mailbox, which is located in 107 Science building during normal business hours. I normally check all of these sources at least once every business day (email is checked most frequently, but is generally reserved for setting up appointments and not answering questions).

Online Course Materials: Relevant course material will be posted to ANGEL. This site contains the abbreviated lecture notes (posted 24 hours prior to the lecture) and tables of information required for the course. My website (www.personal.psu.edu/rcb155) also contains the syllabus and information about research possibilities within my lab. Extracurricular research can provide you with the opportunity to expand your horizons by working with state of the art equipment and analysis techniques. You will learn valuable skills that are important to any scientific or engineering professional while working on cutting edge chemical and materials science research. Please see me for further details.

Shut off all cell phones and all other electronic devices before class begins.

Calculator: You will need a calculator during class, recitation, and for exams. It should be capable of such functions as square roots, logarithms, exponentiation (antilogarithms), and exponential (scientific) notation. If using a programmable calculator, its memory should be cleared prior to quizzes or exams. ***IR capable calculators will not be permitted for use during exams or quizzes***.

Prerequisites: A working knowledge of arithmetic and algebra at the high school level and a recent high school or introductory college chemistry course is required (see website syllabus for details – PSU guide). Students without these intellectual tools will find the material unduly difficult, which will result in a large consumption of your time and/or a poor grade. Unsatisfactory performance on the FTCAP entrance exam will require that you take CHEM 101 (3credits) and/or MATH 022 before taking this course. Note that CHEM 101 does not fulfill graduation requirements for science or engineering majors, even though the grades earned in these courses are used to determine your cumulative grade point average.

You should already know the names and atomic symbols for the elements, Greek prefixes, conversions (like km to m and cm^3 to mL, etc.), etc.

Attendance: Class attendance is mandatory and frequent absences are unacceptable. You must notify me either in writing or by email on or before the day of your absence from class. If you miss a class, it is ***your responsibility*** to determine what materials (including: announcements, handouts, graded papers, etc.) were missed due to your absence. There will be no make-ups for missed lectures or recitations.

Class Cancellation: Generally speaking, when classes are missed due to such reasons as instructor illness, bad weather, or other university wide cancellations, the class will ***not*** be made up. Classes missed due to other circumstances that allow advance notice may be rescheduled in conjunction with the Office of the Registrar and will be announced in class.

Lectures: You should ***read the textbook prior to the lecture***. This time is for discussion and demonstrations; the smaller recitation sections will be used for working problems and answering related questions. Assigned exercises come from the group of problems at the end of each chapter. ***Attendance is mandatory.*** Lectures will be presented in a PowerPoint format and you should print out and bring the abbreviated lecture notes to complete the thoughts, concepts, and worked examples.

Recitation: A recitation period is scheduled each week. ***Attendance is mandatory.*** On occasion, this time will be used for further lecture when necessary. The purpose of recitation is to review homework problems relevant to material covered in lecture during the previous week. ***Bring your textbook and calculator to all lecture and recitation periods.*** You should be prepared for recitation by studying the material in advance and doing ALL assigned homework problems. Failure to prepare for a class will result in minimal benefit and a poor grade.

Seating Assignment for Recitation: Remaining in the same seats throughout the semester will allow me to get to know you all better in the short period of time we have together. To have your assigned seat changed (to sit closer to the front of class, for instance), let me know and I will make the appropriate arrangements.

Homework: The assigned problems will not be collected or graded; however, you are strongly advised to complete the homework problems. These exercises will help you ascertain your level of understanding of the material covered in class and should be completed prior to the recitation period so that your questions can be addressed (note that quizzes given during recitation commonly include material covered in the most recent lectures and may come directly from the homework problems). If you understand how to solve the homework problems, quiz problems as well as the ones discussed in lecture, you should be able to confidently solve those you encounter on exams. A homework assignment sheet is given at the end of this syllabus; any changes will be announced in class and immediately posted on my website.

Exams: There will be three one-hour exams and a two-hour final exam. ***All exams are cumulative.*** All hour exams will be administered during the regular class period. Check schedule for the examination dates. The final exam will **not** be returned (you can see the final exam by coming to my office at least two days after the exam is given).

Quizzes: Twelve 10-point quizzes will be given at the end of selected lecture and recitation periods throughout the semester (impromptu). The 10 highest scoring quizzes will be used when determining the final course grade. Makeup quizzes will be given only for excused absences (e-mail notification of absence is required).

Make-up Exam and Grading Policy: ***There will be no make-up exams*** with the exception of student athletes who provide a minimum of one week written notification. The lowest of the three exams will be dropped from your grade (unless it helps your overall grade). Therefore, if you miss an exam, it will count as your lowest exam grade and will be dropped. Grading errors must be contested within 7 days after the graded exam or quiz is returned to you. Normally, exams will be returned either the next class or recitation period.

Telecommunication Devices: Please turn off all cell phones prior to class. Do not answer your phone or check messages at anytime. During a quiz or exam, I must assume foul play and you will receive zero points for that particular test. If there is a pending emergency, please let me know and I will accommodate your needs.

Academic Integrity: The Campus Statement on Academic Integrity, adopted by the Altoona College Faculty Senate states: "Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Academic dishonesty includes, but is not limited to cheating, plagiarism, fabrication of information or citations, facilitating acts of academic dishonesty by others, unauthorized prior possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students." (Policies and Rules for Students Section 49-20 at www.psu.edu/dus/unadbk/integrity.html). ***All incidents of cheating and plagiarism will result in 0 points awarded for that particular assignment or exam***. Further action will be taken if warranted.

Students with Disabilities: Penn State Altoona is strongly committed to equal access to its programs and services for all students with disabilities that are otherwise qualified. Students with special needs, including students with physical or emotional impairments or learning disabilities are encouraged to meet with the disability services coordinator prior to attending classes. The Office for Disability Services (ODS) is responsible for all disability-related concerns of Penn State students and employees. Contact Dr. Joy Himmel, Director Health and Wellness Center, Disability Services Liaison, jyh1@psu.edu, 949-5540.

Course Grade: Grading for the course will be based on the three one-hour exams, the top ten quiz scores, and the final examination. There will be no extra credit assignments.

Course Work	Dates	Total Possible Points
Hour Exam 1	Friday, February 5	100
Hour Exam 2	Friday, March 5	100
Hour Exam 3	Friday, April 9	100
	*Drop lowest exam score	-100
Quizzes	Impromptu	100
Final Exam	Tuesday, May 4	200
Participation		25
Total		**625 (or 525)**

*Only one exam score will be dropped and only if it helps your final grade. ***If you miss an exam***, you will receive zero points for it and, therefore, will count as your lowest exam score.

Your grade will be based on the percentage of points earned out of the total number of points available for the course:

		100-93 %	A	92-90 %	A^-
89-87 %	B^+	86-83 %	B	82-80 %	B^-
79-77 %	C^+	76-70 %	C		
		69-55 %	D		
		<54 %	F		

There will be ***no curving*** of course grades.

If you are unsure what your current grade is, just ask.

Tentative Class Schedule for Chemistry 110 - Spring 2010 Semester

Chapter	Homework Problems	Approximate Lecture Periods
Chapter 1. Chemistry and Measurement **REVIEW** Sections: 1-8	Learning Objectives: 1-8 Problems: 4, 6, 7, 11, 16-18, 20, 21, 27, 35, 36, 37, 39-43, 45, 47, 49-57, 59-63, 65-67, 71-74, 77-82, 86, 91, 94, 101, 107, 121, 123-128, 131-136, 147, 148, 158 (76 should be 31.5 g, not 5.95 g)	1-4
Chapter 2. Atoms, Molecules, and Ions **REVIEW** Sections: 1-10	Learning Objectives: 1-10 Problems: 2, 5, 6, 8, 12, 14, 16, 17, 19, 20, 21, 28, 32, 35-40, 44, 45, 48, 53, 58-60, 66-69, 72, 73, 75-91, 93, 96-102, 104, 108, 109, 115-126, 133, 136, 138, 143, 146 (From chapter 24: 14, 51, 52)	5-7
Chapter 3. Calculations with Chemical Formulas and Equations Sections: 1-8	Learning Objectives: 1-8 Problems: 3, 6, 7, 10, 12, 14, 21, 25, 27-29, 32, 34, 36-39, 41-43, 45, 48, 49, 52-54, 57, 58, 63, 66, 69, 70, 73, 74, 79-81, 85-87, 89, 91-93, 96, 99, 102, 104, 105, 107-111, 118, 119, 122, 127	8-10
	Exam 1 (Chapters 1-3) Review Session 2/4/10 6:55 to 10:00 pm in 134 Hawthorn	11 2/5/10
Chapter 4. Chemical Reactions Sections: 1-10	Learning Objectives: 1-10 Problems: 2, 3, 5, 15, 17, 21, 23, 27, 29-33, 35-39, 41, 42, 44, 46, 47, 49, 51, 52, 54, 56-60, 62, 63, 65, 67, 71-74, 77, 79, 83-85, 89, 91, 93, 95, 97, 98, 101, 102, 106, 109-111, 113, 115, 118, 136, 139, 143, 145, 151	12-17
Chapter 5. Gaseous State Sections: 1-3 **STUDENT** Sections: 4-8	Learning Objectives: 1-8 Problems: 3, 5, 9-11, 15-17, 20, 21, 29, 31, 37, 38, 40, 41, 44-46, 48, 51, 52, 55, 56, 58, 59, 61, 63, 65, 67, 69, 75-78, 80, 81, 83, 86-89, 93, 97, 99, 101, 103, 108, 111-114, 117, 119, 121, 145, 147, 151	18-19
Chapter 6. Thermochemistry Sections: 1-8 Section: 9 **STUDENT**	Learning Objectives: 1-8 Problems: 2, 5-7, 10, 13, 15, 18, 19, 21, 25, 36, 43, 46, 47, 49, 51-54, 56, 57, 59-61, 63-67, 70, 73-83, 86, 90, 93, 95, 97, 101, 103-106, 109-112, 115, 116, 119, 123, 127, 131, 137, 140, 142	20-22
	Exam 2 (Chapters 4-6) Review Session 3/4/10 6:55 to 10:00 pm in 134 Hawthorn	23 3/5/10
Chapter 7. Quantum Theory of the Atom Sections: 1-5	Learning Objectives: 1-5 Problems: 2-5, 16-19, 28, 35-39, 42, 44-47, 49, 50, 52, 53, 57, 59, 61, 63-70, 72, 73, 75-78, 80, 82, 83, 84, 88, 89, 99, 102, 104, 106, 107, 109, 110	24-25

Chapter 8. Electron Configurations and Periodicity Sections: 1-4, 6 Section: 7 **STUDENT**	Learning Objectives: 1-4, 6, 7 Problems: 3-9, 11, 14, 16, 23, 33, 34, 37, 41-45, 48, 49, 51, 52, 56, 58-64, 67-69, 71-74, 81, 82, 94, 96, 98, 101, 105, 107	26-28
Chapter 9. Ionic and Covalent Bonding Sections: 1-11	Learning Objectives: 1-11 Problems: 5, 8, 9, 12-16, 18-20, 27, 30, 31, 36, 37, 40, 42, 43, 46-50, 52, 55-60, 62-66, 68, 69, 71-74, 76, 78, 79, 84-86, 88-92, 95-97, 100-103, 106, 109, 110, 118, 123, 127, 129, 134, 136	29-31
Chapter 10. Molecular Geometry and Chemical Bonding Theory Sections: 1-5, 7	Learning Objectives: 1-7 Problems: 1-4, 6-9, 19, 20, 23, 24, 27, 29, 31, 33-50, 53-55, 61, 62, 65, 66, 69, 72, 73, 90, 93, 96, 100, 105	32-34
	Exam 3 (Chapters 7-10) Review Session 4/8/10 6:55 to 10:00 pm in 134 Hawthorn	35 4/9/10
Chapter 11. States of Matter; Liquids and Solids Sections: 1-6	Learning Objectives: 1-6 Problems: 3, 4, 6, 10-14, 18, 21, 23, 29, 36-38, 40, 41, 43, 44, 47, 48, 50, 51, 55, 56, 58, 59, 63-66, 69-80, 96, 97, 99, 101, 103, 109, 110, 117, 122, 133, 139, 145, 147	36-38
Chapter 12. Solutions Sections: 1-8	Learning Objectives: 1-8 Problems: 2-6, 8, 9, 11, 19, 22-24, 27, 28, 30, 36, 39-44, 47, 49-51, 53, 56-58, 60, 62, 63, 65-69, 71, 72, 75, 77, 79, 80, 87, 89, 92, 93, 95, 98, 101, 103, 109, 110, 115, 116, 125, 129, 131, 135	39-43
	Final Exam **(40% Chapters 11-12 — 60% ALL prior material)** Review Session 5/3/10 5:05 to 8:00 pm in 134 Hawthorn	**Section 5-8** Tuesday, May 4 8:00-9:50 am 117 Science

***You are responsible for learning (and will be tested on) all material marked* REVIEW *or* STUDENT**.

Operational skills and practice problems reflect the skills you will be expected to know. To succeed in this course will require taking comprehensive notes during lecture and spending at least 6 to 8 hours weekly reading the text, answering homework problems and preparing for exams. If you have difficulty with particular problems, it is in your best interest to do additional problems to further master the material. Most importantly, try to enjoy the course and seek my assistance when you do not understand a problem or concept.