WALTERS STATE COMMUNITY COLLEGE
Course Syllabus

Course: CHEM 1030/1031 – Concepts of Chemistry & Laboratory
Semester: 2012 - 2013
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Office Hours: Posted on Instructor’s Office Door

Course Contact
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Required Textbook and Supplementary Materials:
Nivaldo Tro; Chemistry in Focus, 5th ed; Brooks/Cole Cengage Learning; 2012.

Catalog Course Description: (4 semester hours, General Education Course )
A course designed for non-science majors based on the Tennessee Science Curriculum (TSC) Standards for K-8 and NSF standards. Topics include atomic structure, bonding, acids, bases, chemical reactions, nuclear chemistry, organic chemistry and use of household chemistry. Students will investigate chemistry principles useful for implementation of hands-on science activities for K-8 students. 3 hours lecture/2 hours laboratory.

Course Outcomes:
Upon completion of this course students should be able to:
1. Understand the importance of chemistry to society.
2. Be able to evaluate the impact of chemistry in our lives.
3. Understand atomic structure and differentiate between types of chemical bonding.
4. Understand fundamental principles of chemistry.
5. Understand basic principles of periodic table.
6. Identify and use common physical & chemical processes.
7. Understand and follow common chemistry procedures.
8. Assemble a ready to use portfolio of chemical resources and activities.

The subject content for the core is presented as learning outcomes which are available on eLearn and on the Chemistry Home Page at http://library.ws.edu/mChemistry.

Common Core:
What is Chemistry, Scientific Method & Measurements
Matter, Atoms & Molecules
Atomic Structure
Chemical Names & Calculations
Chemical Bonding
Chemical Reactivity
Acid-Base Reactions
Energy & Society
Organic Chemistry-chemistry of carbon
Medicinal & Household Chemistry
Man’s impact on the Environment
Oxidation-Reduction Reactions

Methods of Instruction:
Lectures, demonstration activities and laboratory hands on: You are expected to attend class, pay attention, and participate actively in discussion and activities by asking and answering questions. You will get more out of the lecture if you have read the material in the textbook ahead of time. Always bring your book with you to lecture. Learning Outcomes for students can be found in the Walters State D2L page for this course and the chemistry section of the Natural Science homepage. Class handouts and PowerPoint presentations used in lecture will be available for your download and review on the Walters State eLearn page for this course.

Reading: The textbook provides a good general introduction to the field of basic chemistry. The book covers most of the topics that are approached in the class. Thus, it will serve to augment lecture and to provide material for discussion. In addition, readings in the book will support the material that you will be studying in labs. The book includes many things which will help you understand the material and study for the tests, including a list of key concepts, chapter summaries, review questions, and a list of key terms.

Expectations
Satisfactory performance in college courses generally asks for two hours of study outside of class for each hour in class. This estimate applies to an "average" student expecting an "adequate" (C) grade. Students aiming higher or those with academic problems should expect to spend more effort than the minimum. Should you procrastinate, not read ahead of time, or expect to cram everything on last days before exams this course may not be for you.

The Student can expect from the teacher:
1. Email response within 24 hours during the normal workweek. Holidays and vacations excluded.
2. Email during the weekend will be answered on Monday.
3. Exams to be graded and returned in a timely manner.
4. Enthusiasm for the subject and encouragement to help you when you need it.
5. A fair grading system, with feedback.
6. Learning that relates classroom concepts to the world around us.
7. Respect for you as a learner.

Exams and Grading
Chemistry exams will emphasize factual knowledge and assess the achievement of the Learning Outcomes. Short answer, essay questions, diagrams and multiple-choice questions may be used. Exams primarily focus on what is discussed in class, and material covered in the textbook.

Grading:
Lecture exams: 4 @ 100 pts = 400 pts
Lecture comprehensive final: 1 @ 150 pts = 150 pts
Relevance assignments: 5 @ 10 pts = 50 pts
Portfolio: 1 @ 40 pts = 40 pts
Laboratory experiments: 11 @ 30 pts = 330 pts
Chemistry project: 1 @ 30 pts = 30 pts

Course total = 1000 pts

Student’s % score = [Student’s total points] (100) / 1000
A = 100-90% (900 pts)
B = 89-80% (800 pts)
C = 79-70% (700 pts)
D = 69-60% (600 pts)

**Bonus points:** 60 points maximum: Exit quiz (30 pts) and an extra chemistry project (30 pts).

**Course Ground Rules:**
Students should attend the first day of class or contact the instructor prior to the first class. Failure to do this may result in being dropped from the class.

Plagiarism, cheating, and other forms of academic dishonesty are prohibited.

Students with disabilities must register with Student Support Services in the Student Services Building, Room U134 (phone 423-585-6892) if they need any special facilities, services, or consideration.

Students in need of tutoring assistance are encouraged to contact the Office of Student Tutoring located in the Student Services Building, Room L107 at phone number 423-585-6920 or 423-798-7982 for the Greeneville Campus, 865-908-5494 for the Sevierville Campus, 423-851-4762 for the Claiborne Campus.

Students receiving any type of financial aid or scholarship should contact the Financial Aid Office before making any changes to their schedule. Schedule changes without prior approval may result in loss of award for the current term and future terms.

Students who have not paid fees on time and/or are not correctly registered for this class and whose names do not appear on official class rolls generated by the Admissions and Records Office will not be allowed to remain in class or receive credit for this course.

Cellular phone use during classroom interaction is prohibited. Cellular phones must be turned to the non-audible mode until after class, at which time calls can be received or checked. (See the Walters State Catalog/Handbook)

For information related to the cancellation of classes due to inclement weather, please check the college’s Web site at www.ws.edu or call the college’s student information line, 1-800-225-4770, option 1; InfoConnect, (423) 581-1233, option 1045; the Sevier County Campus, (865) 774-5800, option 7; or the Greeneville/Greene County Center for Higher Education, (423) 798-7940, option 4. Also, please monitor local TV and radio stations for weather-related announcements. For additional information on this policy see the college catalog.

In the event of a pandemic or other college declared critical event that impacts the college’s ability to proceed with academic course activities as planned, the college reserves the right to alter this course plan. In the event of a pandemic or other event, please refer to the college’s home web page, www.ws.edu or call InfoConnect, (423) 581-1233 for further information.

**Attendance:** Regular class attendance is a student’s obligation. (See the Walters State Catalog/Student Handbook) If for some reason a student misses class, it is his or her responsibility to see the instructor regarding missed assignments and/or activities and to be prepared for the next class. Excessive absences may substantially lower the semester grade. The college requires the instructor to keep accurate records and to report when students are not attending class. There are **NO make-up laboratory periods.** A student who misses a laboratory period can use the bonus chemistry project to offset one missed laboratory.

**STAY AWAKE IN CLASS.** Your mere presence in class is not sufficient—you must be able to actively process the information presented! Sleeping in class is disruptive in two ways: the student who is snoozing is not interested and not participating in the classroom discussion; secondly, sleeping in class is considered to be disrespectful to the teacher and other students. The penalty for sleeping in class may range from the student being requested to leave the class with a following conference with the instructor, to notification of the Vice-
President of Academic Affairs (in the cases of habitual sleepers). If you have a medical condition that prevents you from staying awake in class, please discuss this with the instructor.

**CLASSROOM COURTESY.** Being in a college environment it is expected that classroom courtesy will be given to your instructor and classmates in limiting unnecessary talking and communication during class lecture or student presentation. Suitable disciplinary action will be taken for those who have difficulty following this policy and disrupt class.

**Your Right to Know:**
Tennessee Law requires that you are provided notice that some of the laboratory exercises involve contact with chemicals which have been identified with potential health hazards. These chemicals include, but are not limited to: acetone, chloroform, formalin, acids and bases. While every effort has been made to make the materials as safe as possible these chemicals are toxic and you must be responsible for their safe handling. If you feel you may be at a higher risk then normal, if pregnant for example, we recommend you consult your physician.

**Laboratory safety:**
1. There will be **NO food, drink or tobacco products in the laboratory.**
2. **NO opened-toe shoes** can be worn during lab. You will not be allowed to stay in the laboratory if the lab exercise uses any sort of glassware or chemicals. This is for your safety.
3. Safety glasses (goggles) will be provided on days that chemicals are being used.
4. **NO purses, bags or coats** on top of the student tables.
5. **NO visitors in the laboratory without prior approval of the instructor.**

**WSCC Catalog Notification Statement:**
All students attending Walters State Community College, regardless of the time and location of the class, must abide by the rules and regulations outlined in the current *Walters State Catalog/Student Handbook* and the current “Walters State Timetable of Classes.” A copy of the *Catalog/Handbook* and the “Timetable of Classes” may be obtained from the Admissions Office on the Main campus or at any of our off-campus sites. You may also access the Catalog/Handbook on-line at the following web address: [http://www.ws.edu/catalog](http://www.ws.edu/catalog).

**Alternative Teaching Plan**
In the event of a pandemic or other college declared critical event, the lead faculty member for this course will use *eLearn* to communicate with the students. If the lead faculty member is affected by this event, another member from the teaching team will assume instruction for the course. The course will continue utilizing an online format of instruction and testing.
Learning Outcomes
Attachment A

A. What is Chemistry, Scientific Method & Measurements
   Content:
   Chemistry the central science  
   Scientific units 
   Metric system  
   Learning Outcomes:
   1. Understand the importance of chemistry to society  
   2. Know common scientific units (length, mass, volume, temperature)  
   3. Using the metric system and use of prefixes  
   4. Ability to convert English and metric units 
   Standard: 12.2

B. Matter, Atoms & Molecules
   Content:
   Atoms & elements 
   Molecules & compounds 
   Mixtures 
   Chemical and physical changes 
   Chemical symbols 
   Chemical equations 
   Learning Outcomes:
   1. Understand the relationship between atoms/elements & molecules/compounds 
   2. Ability to classify matter as mixtures or pure substances 
   3. Ability to differentiate between physical and chemical changes 
   4. Understand chemical symbols and use in chemical equations 
   Standard: 12.1; 12.2; 13.2

C. Atomic Structure
   Content:
   Atomic structure of the atom 
   Atomic number, mass & isotopes 
   Electromagnetic & atomic spectra 
   Locating the electrons 
   Design of the periodic table 
   Periodic atomic and chemical properties 
   Learning Outcomes:
   1. Understand the arrangement of protons, neutrons and electrons in the atom 
   2. Understand the design of the periodic table based on atomic structure 
   3. Ability to predict elemental trends from the periodic table 
   4. Knowledge of the electromagnetic spectrum and relation to atomic structure 
   Standard: 12.3; 14.5
D. Chemical forces and chemical bonding
Content:
- Ionic bonding
  - Ionic compounds, formulas & naming
- Covalent bonding
  - Covalent compounds, formulas & naming
  - Lewis structures & molecular shapes
  - Intermolecular forces & states of matter
Learning Outcomes:
1. Understand differences between ionic and covalent bonding
2. Ability to draw Lewis structures as related to chemical bonding
3. Learn fundamental molecular shapes
4. Understand the importance of intermolecular forces to physical states of matter
5. Ability to name ionic and covalent compounds
Standard: 12.1; 12.2; 12.3

E. Chemical Reactivity
Content:
- Balancing chemical equations
- Reaction classifications & driving forces
- Chemical mole-how much
- Reaction rates-how fast
- Equilibrium-how far
Learning Outcomes:
1. Ability to classify chemical reactions
2. Ability to balance chemical reactions
3. Understand the mole concept and simple mole calculations
4. Understand factors affecting chemical rate
5. Understand the difference between chemical rate and equilibrium
Standard: 13.3

F. Acid-Base Reactions-pass the protons
Content:
- Acid/base definitions & properties
- Common acid and bases
- Acid/base reactions
- Living with pH
  - pH buffers
Learning Outcomes:
1. Ability to identify and classify acids and bases
2. Understand the pH concept and ability to calculate pH values
3. Learn the properties and importance of pH buffers
Standard: 13.1
G. Oxidation-Reduction Reactions - pass the electrons
Content:
- Oxidation/reduction reactions and the electron
- Oxidizing/reducing agents
- Batteries, electrolysis & corrosion
Learning Outcomes:
1. Ability to assign oxidation states to atoms
2. Recognize oxidizing and reducing agents from electron transfer
3. Ability to balance oxidation/reduction reactions
4. Understand the importance of oxidation/reduction reactions
Standard: 12.2; 12.3; 13.3

H. Energy & Society
Content:
- Energy demands of society
- Energy resources for society
- Chemistry and energy
Learning Outcomes:
1. Understand the energy demands of today’s society
2. Learn various energy resources
3. Identify chemical reactions as exothermic or endothermic
4. Recognize the cost to energy to the environment
Standard: 10.4; 10.5; 13.3; 14.2; 14.4

I. Nuclear Chemistry
Content:
- Radioactivity & nuclear reactions
- Half-life
- Fission & fusion
- Nuclear energy and the environment
Learning Outcomes:
1. Understand radioactivity
2. Ability to balance nuclear reactions
3. Recognize the differences between fission and fusion
4. Become familiar with the difficult questions of nuclear energy
Standard: 14.4

J. Organic Chemistry - chemistry of carbon
Content:
- Formulas & structures of organic chemistry
- Common functional groups
- Trends of common organic compounds
- A polymeric world
Learning Outcomes:
1. Understand formulas and structures of organic chemistry
2. Ability to classify common organic groups
3. Ability to relate organic names to formulas
4. Learn the importance of organic chemistry to polymers
Standard: 12.2; 13.3

K. Organic Chemistry - for life
Content:
- Carbohydrates
- Fats & oils
- Amino acids to proteins
Learning Outcomes:
1. Understand the importance of organic chemistry to life processes

L. **Medicinal & Household Chemistry**
   Content:
   - Common drugs & uses
   - Beauty in chemistry
   - Cleaning through chemistry
   - Herbicides & pesticides

Learning Outcomes:
1. Recognize the importance of chemistry in our daily lives.

M. **Man’s impact on the Environment**
   Content:
   - Acid rain
   - Greenhouse effect
   - Precious water
   - Green chemistry

Learning Outcomes:
1. Recognize our environmental responsibility to use the chemistry wisely

Standard: 13.1; 13.2; 13.3
Multiple Sections Verification and Assessment Plan

Concepts of Chemistry with Laboratory

Intended Outcomes

- All chemistry instructors will use the template syllabus approved by the general education committee.
- All biology instructors will address same competencies and expected student outcomes as outlined in the template syllabus.
- Students completing Concepts of Chemistry with Laboratory (CHEM 1030-31) will demonstrate competency in the fundamental principles and concepts presented in that course.

Assessment Measure, Technique and Target Course

- The division secretary and division dean shall monitor syllabi production and use by all biology instructors.
- Concepts of Chemistry with Laboratory (CHEM 1030-31) students will complete a comprehensive final exam in which questions related to Concepts of Chemistry with Laboratory (CHEM 1030-31) principles and concepts have been embedded. The division dean and faculty teaching chemistry will form the assessment committee comparing students’ response to the embedded questions across all sections.

Assessment Criteria

- 100% of faculty will use the template syllabus addressing the same competencies and course content.
- At least 60% of the embedded items in the comprehensive final exam of the Concepts of Chemistry with Laboratory (CHEM 1030-31) will be correctly answered.