WALTERS STATE COMMUNITY COLLEGE
Course Syllabus

Course: CHEM 1030/1031 – Concepts of Chemistry with Laboratory
Semester: Fall 2014 Spring 2015
Instructor: Dr. Douglas Hensley, Office 203 MMH, Phone: 865-774-5846
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Office Hours: Posted on Instructor’s Office Door

Course Contact
Dr. Jeff T. Horner, Dean of Natural Science, Office 125 NSCI
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Required Textbook and Supplementary Materials:
Nivaldo Tro; Chemistry in Focus, 5th ed; Thomson Brooks & Coles; 2012. Scientific calculator.

Catalog Course Description: (4 semester hours, General Education Course)
A course designed for the non-science major with emphasis toward the Tennessee Science Curriculum (TSC) Standards for K-8. Topics include measurements, chemical naming and formulas, atomic structure, bonding, acids & bases, chemical reactions, nuclear chemistry, organic chemistry and household chemistry. Students will investigate basic chemistry principles and use hands-on science activities of common materials to demonstrate these principles. (Pre-requisite: Students must have completed all learning support requirements.)

General Education Course Designation: Natural Science (4 semester hours)

Student Learning Outcomes:
The course content has been constructed around a common core. The subject content for the core is presented as learning outcomes which are available on eLearn and on the Chemistry Home Page at library.ws.edu/mChemistry

Upon completion of this course students will be able to communicate skills related to the following topics:

1. Measurements & Units – demonstrate fundamental math skills related to the metric system, dimensional analysis, graphing & interpreting graphs, scientific notation and units.

2. Matter, Atoms & Molecules – explain fundamental aspects of atomic structure, classification of matter, physical & chemical changes and understand chemical symbols and reaction notations.

3. Atomic Structure - describe valence electrons and the design of the periodic table with its trends. Discuss the importance of the electromagnetic spectrum and its relationship to atomic structure.
4. **Chemical forces & bonding** – explain the differences between ionic, covalent and intermolecular forces as related to chemical compounds. Generate Lewis structures and relate them to molecular shapes.

5. **Chemical reactivity** – demonstrate ability to balance, classify and predict fundamental chemical reactions and apply chemical stoichiometry methods.

6. **Acid/Base Reactions** - describe properties of acids, bases and buffers. Identify substances as acids and bases, and importance of pH.

7. **Energy** – discuss basic energy concepts and resources with respect to sustainability and relationship to the environment.

8. **Nuclear Chemistry** – describe radioactivity, nuclear reactions, half-life, fission and fusion.

9. **Organic Chemistry** – describe organic compounds, structures and the application to polymers.

10. **Chemistry & Environment** – discuss acid rain, Greenhouse effect, “Green” chemistry and the risk/benefit dilemma.

11. **Household Chemistry** - recognize and apply chemistry from various common consumer products.

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**Course Ground Rules**

All students attending Walters State Community College, regardless of the time, location, or format 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. The Catalog/Student Handbook and the Timetable of Classes are online at: [http://ws.edu](http://ws.edu)

Students must attend the first day of on-ground class or contact the instructor prior to the first class. Failure to do this may result in being dropped from the class. Excessive absences may substantially lower the course grade.

Students enrolled in web courses must follow the course attendance policy defined for online attendance during the first week of class and throughout the term. Failure to do this may result in being dropped from the class during week one OR may result in the accrual of absences which may negatively impact the student’s grade in the course.

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. The minimum penalty for cheating is a “0” (zero) on the examination or assignment. Academic dishonesty may result in an “F” for the course. Additional information can be found in the WSCC Catalog/Student Handbook at: [http://ws.edu](http://ws.edu).

Students with disabilities must register with Student Support Services each semester 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 as follows:

- Morristown Campus - Student Services Building Room L107 – (423) 585-6920
- Greeneville Campus – Room 420 - (423) 798-7982
- Sevierville Campus - Marshall-Maples Hall Room 118 – (865) 286-2787
- Claiborne Campus – Room 123A (423) 851-4761

Specific tutoring assistance in mathematics and writing is available in-person and online as follows:

- Morristown Campus – English Learning Lab – HUM 120 – (423) 585-6970
  - https://www.ws.edu/academics/humanities/writing-lab
- Morristown Campus – Mathematics Lab – MBSS 222 - (423) 585-6872
  - http://ws.edu/academics/mathematics/learning-lab

Students who need assistance with computing and technology issues should contact the IET Helpdesk by phone at Morristown: 423-318-2742 Greeneville: 423-796-8186 or Sevierville: 865-286-2789 or on-line access at: http://helpdesk.ws.edu/.

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 Walters State student information system (StarNET) will not be allowed to remain in class or receive credit for this course.

Electronic devices must not disrupt the instructional process or college-sponsored academic activity. Use of electronic devices is prohibited unless use of the device is relevant to the activity and use is sanctioned by the faculty member in charge. Electronic devices that are not relevant to the activity or sanctioned by the faculty member in charge should be set so that they will not produce an audible sound during classroom instruction or other college-sponsored academic activity.

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 Campus (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 at: http://ws.edu

Dual Enrollment students attending on a high school campus should refer to the high school inclement weather cancellations.

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.

Regular class attendance is a student’s obligation for any course regardless of format. (See the Walters State Catalog/Student Handbook) If a student misses class, it is his or her responsibility to contact the instructor regarding missed assignments and/or activities and to be prepared for the next class assignment.
All forms of student Financial Aid may be jeopardized or lost due to the lack of Satisfactory Academic Progress in one or multiple courses. Lack of Satisfactory Academic Progress may negatively impact a student's degree/certificate completion pace and further jeopardize Financial Aid eligibility.

**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. An Academic Misconduct Form will be filed for those who have difficulty following this policy and disrupt class.

**Methods of Instruction:**
Lectures, demonstration activities and laboratory are 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 home page for this course in 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.

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 ties concepts into the real world around us.
7. Respect for you as a learner.

**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. While every effort has been made to make the activities as safe as possible, it is always best to treat all chemicals as toxic and be responsible for their safe handling and your hygiene. This includes washing your hands before leaving the laboratory. If you feel you may be at a higher risk than normal, if pregnant for example, please let your instructor know and consult your physician.

**Basic laboratory safety:**
1. **NO food, drink or tobacco products in the laboratory.**
2. **NO opened-toe shoes** worn during lab. You may be asked to leave the laboratory if the lab exercise uses glassware or laboratory 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 work benches.
5. **NO visitors in the laboratory** without prior approval of the instructor.

**Assignments, Exams, Laboratory 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 focus on what happens in class as supplemented and amplified by the readings.

**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@30 pts = 30
- Laboratory experiments: 10@30 pts = 330 pts
- Class project: 1@30 pts = 30 pts
- Course total = 960 pts

Student’s % score = [Student’s total points] (100) / 960
A = 100-90%
B = 89-80%
C = 79-70%
D = 69-60%

**Bonus points:**
Each professor has the option to offer the opportunity to earn up to 60 additional points through the semester. Examples include, but are not limited to, bonus questions on exams, in class quizzes, attending a scientific event, etc. The instructor’s policy will be explained in detail on the first day of class. In no instance will credit be provided for any activity not related to the scope of the course. The aim of the class is to get a solid understanding of chemistry so that grades reflect our abilities to communicate the material and not a supplementary assignment or task. All students, especially those that feel they are struggling with the material, are strongly encouraged to use office hours, send emails, make appointments for extra help, etc. throughout the semester.

Students are required to supply a #2 pencil and calculator (no cell phone or tablet calculator apps) for each lecture exam.

The wearing of hats and caps in class on test days is not allowed! Students will be asked to remove their hats and caps.

Academic Dishonesty Policy: Any student who violates the college’s academic integrity policy will automatically receive a “0” for that assignment or exam.

Students who are absent on the day of an exam, may be required to provide a documentable excuse before a make-up exam will be given. The missed exam must be made-up before the next lecture exam.

There are **NO make-up laboratory periods.**
A student who misses a laboratory period must use the bonus chemistry project to offset the missed laboratory. More than one missed laboratory period will result in a “0” for those missed periods.

**The last day to drop a course or withdraw from the college-full term for Fall 2014 term is November 5, 2014.**
**The last day to drop a course or withdraw from the college-full term for Spring 2015 term is April 2, 2015.**

**Learning Outcomes**
Attachment A

A. **What is Chemistry, Scientific Method & Measurements**

   **Content:**
   - Chemistry the central science
   - Scientific units
   - Metric system
   - Graphing

   **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
5. Ability to draw a linear graph & interpret

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

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

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 intermolecular forces to physical states of matter
   5. Ability to name ionic and covalent compounds

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

F. Acid-Base Reactions

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
G. **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

H. **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

I. **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

J. **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
2. Risks vs benefits
K. Household Chemistry

Content:
- Kitchen chemistry
- Medicine cabinet chemistry
- Cosmetic chemistry
- Cleaning chemistry

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