CHM 101 Course Syllabus - Fall 2013

# GENERAL CHEMISTRY I CHM 101

Course Syllabus Fall 2013 Florence-Darlington Technical College Department of Natural Sciences

Course title:	CHM 101, General Chemistry I	
Instructor:	Charles Taylor	
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Course prerequisites:	None.	
Web site	http://scienceattech.com	

#### Information at-a-glance:

Detailed contact information for Mr. Taylor is on the course web site:

http://scienceattech.com/?page\_id=282

### **Required textbooks:**

- 1. Zumdahl, Steven S., DeCoste, Donald J. <u>Basic Chemistry</u>, Houghton Mifflin Co. 7<sup>th</sup> Edition.
- Hein, Best, Miner, and Peisen; <u>Foundations of College Chemistry in the</u> <u>Laboratory</u>, Brooks/Cole Publishing Co. 13<sup>th</sup> Edition. (*lab manual*) Warning! Check any used copy of the lab manual to make sure it is not missing pages!

## **Required materials:**

A *scientific* calculator is required. The calculator must be able to handle scientific notation – look for an "EE" or "E" (funny-looking boldface capital E) button. A four-function calculator is **NOT** sufficient for this class!

If you do not currently have a scientific calculator, simple models like the Texas Instruments TI-25X and the CASIO fx-260 solar calculators are available at area retailers for under \$10. If you aren't sure whether you have the right calculator for the course, *ask the instructor*. If you are taking one of Tech's math classes and have a TI-83 or TI-85 calculator, your calculator is fine for this course. I will demonstrate calculations on the screen in class using a TI-83 calculator.

#### Web site:

Helpful material for this course will be posted on the course web site, <u>http://scienceattech.com</u>.Visit the site at least once after each class period.

Notes from each day, problem and quiz solutions, study guides, and other course documents will be posted on the web site.

## **Course description:**

This introductory course in chemistry is designed to prepare the student for a college chemistry course and for further study in the sciences. The course emphasizes critical thinking skills and mathematical solutions to chemical problems. Lab exercises will

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supplement course lectures.

### **Course meeting times:**

	Time	Room
Lecture	9:30 AM - 10:45 AM, MW	5402
Lab	9:30 AM - 12:20 PM, F	5402

#### **Evaluation and grading:**

Your course grade will be determined by the following:

Hour tests (average of four)	45%
Quizzes / Weekly assignments	10%
Cumulative final examination	20%
Laboratory	25%

Mathematically,

 $Grade = 0.45 \times (Test avg.) + 0.10 \times (Quiz avg.) + 0.20 \times (Final exam) + 0.25 \times (Lab)$ 

Here's how the lab grade is determined:

Average of experiment grades (team <sup>*</sup> )	60%
Average of the two lab exams (individual)	35%
Cleanliness and safety (class section)	5%

\*You will work in teams during lab experiments. Your team will hand in a single report for the day's lab.

Mathematically,

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Lab = 0.60 \times (Experiment avg.) + 0.35 \times (Lab exam avg.) + 0.05 \times (Cleanliness \& safety)
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The grading scale for this course is a traditional ten-point scale.

Letter grade	Grade range
А	90-100
В	80-89
С	70-79
D	60-69 **
F	Any grade below 60

\*\*You must make at least a C to "pass" the course for most FDTC programs!

#### Attendance / Make-up policies:

It is the responsibility of the student to attend all scheduled classes and observe all participation requirements in each of the courses in which he/she is enrolled. If a student

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is absent or fails to participate in more than 10% of the total hours that a course usually meets during a semester, the student <u>will be subject to a failing grade</u> or withdrawal by the instructor. It is the student's responsibility to initiate a withdrawal if he/she is unable to complete course requirements. Exceptions to this policy can be made only by the appropriate Associate Vice President.

If you must be absent from the class for any reason, you are responsible for any missed notes or assignments. You will <u>not be allowed to make up a missed quiz or assignment</u>. If it's a take-home quiz or assignment, make sure to turn it in early if you're going to be absent on the due date. I accept scanned or typed take-home quizzes by e-mail, but they must be submitted <u>before the regular class meeting time on the day the quiz is due</u>.

Don't miss labs! <u>There will be no make-ups for missed labs</u>. I will drop one lab report grade at the end of the semester. If you miss a single lab, that will be your dropped grade. If you miss a second lab, it will be counted as a zero grade.

If you miss a single test, whatever the excuse, the <u>cumulative final exam grade</u> will be substituted for the missed test. You will receive a zero grade for any subsequent missed test and will be asked to withdraw from the course. If you know <u>in advance</u> that you will miss a test because of an unavoidable conflict, you may <u>contact me at least 48 hours</u> <u>before the test you will miss</u> and arrange to take the test. (If you miss *no* tests during the semester, the final exam grade will substitute for your *lowest* test grade if that is to your advantage.)

In short, it's vitally important that you be in class and lab. You can't afford to fall behind.

#### Withdrawal policy:

Students who do not complete course requirements must withdraw prior to the withdrawal deadline, or they will receive an "F" in the course.

The last day to withdraw from CHM 101 with a "W" is **November 1, 2013**. After this date, you may withdraw from the class <u>only with the permission of the appropriate FDTC associate vice president</u>.

If you simply stop coming to class before the withdrawal date without completing the withdrawal process, you will be assigned an "F".

If you stop coming to class after the withdrawal deadline, you will be assigned an "F".

#### **Disability statement:**

If you have a documented disability and require special assistance or accommodations to participate fully as a student, please contact the Director of Career Services.

#### Academic dishonesty policy:

All forms of academic dishonesty including, but not limited to, cheating on tests, plagiarism, collusion, and falsification of information will be subject to disciplinary

action.

Cheating is defined to include, but not limited to, the following:

- 1. Copying another student's work or test.
- 2. Using unauthorized materials during a test.
- 3. Collaborating with another during a test or on assignments.
- 4. Knowingly obtaining, using, buying, selling, transporting, or soliciting in whole or in part contents of a test or other work.
- 5. Bribing another person to obtain tests or information about tests.
- 6. Substituting for another student, or permitting another to substitute for oneself.

Plagiarism is defined as the appropriation of any other person's work and the unacknowledged incorporation of that work in one's own work offered for credit.

Falsification of information is defined to include, but not limited to the following:

- 1. Forgery, alteration, or misuse of college documents, records, or identification.
- 2. Destruction of evidence with the intent to deny its presentation to the appropriate hearing or panel.

Any proven case of academic dishonesty will result in an "F" for the assigned work or test and may result in administrative withdrawal from the course, with a grade of "F" assigned after an administrative hearing. Additional sanctions, including administrative probation or suspension, appropriate to the incidents may be imposed pursuant to the Student Code and Grievance Procedures.

#### **Cell phones / electronic communications devices:**

Cell phones and other electronic communications devices must be switched **off** before class or laboratory starts. If your cell phone or other device rings or vibrates loudly enough to disrupt the class, you will be asked to leave the classroom for the remainder of class. If you are employed in a job where you are required to be "on call" during class hours (police, fire, EMT, etc.), please provide me with appropriate documentation at the beginning of the semester. If you have an emergency situation that requires your cell phone to be on during class, please let me know **before** class.

Since cell phones and similar devices can be used to transmit test answers to and from the classroom, any use of cell phones or similar devices during a test will be considered cheating and will be dealt with accordingly.

#### Other information for students:

A handout containing more administrative information you need to know is available at the following link:

http://scienceattech.com/?page\_id=1848

#### Lab policies:

General

- Your experiments are cooperative exercises. You will work in teams for each experiment, and your grade will be partially determined by your team's performance. In addition, your grade will be affected by how well the class as a whole follows safety and cleanliness guidelines. You will be given lab exams during the semester to test how well you understood the laboratory experiments.
- If you miss a lab, you will not get credit for that day's work (as you weren't there). The rest of your team will not be penalized.
- If you arrive more than 20 minutes past the scheduled start time of a laboratory period, you will be counted as absent for the lab and *will not be allowed to enter the laboratory*.
- Your lab section as a whole will be inspected weekly for cleanliness and safety. Your lab section will be assigned a grade of "pass" (one point), "half pass" (half a point) or "fail" (zero points). Your cleanliness and safety grade will be your section's total points for the semester divided by the total number of experiments in the semester - expressed as a percentage. For example, if there were twelve experiments and your class section got 8 passes, 3 half passes, and one failure, your cleanliness and safety grade would be:

$$\frac{(8\times1)+(3\times0.5)+(1\times0)}{12}\times100=79$$

Preparation

- Students are expected to know what assignment(s) will be performed each lab session.
- Students are expected to read the assigned experiment(s) prior to each lab session.
- A student will not be allowed to perform an experiment without his or her lab manual (A photocopy of the required sections for that day is acceptable.)

Most of the labs require calculations to be performed. Each student <u>must</u> bring a scientific calculator to each session.

#### Lab teams:

You will be assigned a team at the beginning of the semester. Lab teams will consist of either two (minimum) or three (maximum) people. You will work with your team the entire semester if possible. If for some reason you would like to change teams, please come see me. If a team drops to one student, teams will be rearranged so that everyone has a team of at least two people again. (This might require breaking up of a three-member team.)

It would be a good idea to use your team members as a study group.

#### Lab safety and cleanliness:

You are responsible for working in the lab in a safe manner <u>and</u> for leaving the lab and the lab equipment clean and in order. Here are some things you need to be aware of

while in the lab.

- Safety issues. (This is a brief summary we'll go over more in lab)
  - 1. Safety is your top concern in the laboratory!
  - 2. Some of our chemicals can hurt you in small amounts. Handle <u>all</u> chemicals carefully.
  - 3. Be aware of safety features of the lab such as eye wash stations and fire blankets.
  - 4. Wear safety goggles and protective aprons when <u>anyone</u> is working in the lab.
  - 5. Do <u>not</u> eat or drink in the lab. Also, do not <u>bring</u> food and drink into the laboratory, as it could become contaminated with chemicals.
- Cleanliness. You are to leave the lab as clean as you found it (or cleaner).
  - 1. Clean glassware after use. Don't put dirty glassware back in the drawers.
  - 2. Return glassware to the place you got it after you're done.
  - 3. Clean up any spilled chemicals. In particular, check on or around <u>balances</u> for spills.
  - 4. Throw trash in the wastebaskets, not in the sinks. Trash in the sinks clogs our drains. Throw glass away only in the designated <u>broken</u> <u>glass container</u>.

## Lab schedule:

The laboratory schedule is available on the course web site.

## **Course objectives / competencies:**

Upon completion of this course a student should be able to:

- 1. Define chemistry.
- 2. List ways in which chemistry has contributed to other sciences and technology.
- 3. Understand a brief history of chemistry.
- 4. Describe and give examples of the scientific method.
- 5. Define good study habits.
- 6. Understand measured numbers and units.
- 7. Place numbers in scientific notation.
- 8. Do calculations involving length, mass, and time.
- 9. Do calculations involving temperature.
- 10. Do calculations involving units of volume.
- 11. Understand significant figures.
- 12. Understand significant figures in arithmetic results.
- 13. Understand dimensional analysis.
- 14. Convert units of measurement.
- 15. Understand temperature scales.
- 16. Define density.
- 17. Do calculations with density.
- 18. Understand various states of matter.
- 19. Identify physical and chemical changes and properties.

- 20. Differentiate substances and mixtures.
- 21. Differentiate elements and compounds.
- 22. State and understand the Law of the Conservation of Mass.
- 23. Define energy.
- 24. Define kinetic energy, potential energy, and energy units.
- 25. Understand heat and perform heat calculations.
- 26. Define the Law of the Conservation of Energy.
- 27. Understand Dalton's Atomic Theory.
- 28. Understand the particle structure of the atom.
- 29. Determine atomic weight.
- 30. Understand the organization of the Periodic Table of Elements.
- 31. Compare molecular and ionic substances.
- 32. Write molecular formulas.
- 33. Write ionic formulas.
- 34. Understand electrical properties of substances in solution.
- 35. Understand formulas for binary ionic compounds.
- 36. Name binary ionic compounds (single metal cation).
- 37. Name binary ionic compounds (several metal cations).
- 38. Name binary molecular compounds.
- 39. Name compounds with polyatomic ions.
- 40. Name binary acids.
- 41. Name oxyacids.
- 42. Recognize chemical reactions.
- 43. Understand chemical equations.
- 44. Balance chemical equations.
- 45. Identify combination and decomposition reactions.
- 46. Identify and predict products in a single-replacement reaction.
- 47. Identify double-replacement reactions.
- 48. Identify and predict products in double-replacement reactions: precipitation.
- 49. Identify and predict products in double-replacement reactions: gas formation.
- 50. Identify and predict products in double-replacement reactions: neutralization.
- 51. Identify and predict products in combustion reactions.
- 52. Determine molecular weights and formula weights.
- 53. Define the concept of a mole.
- 54. Determine molar mass.
- 55. Use molar masses in calculations: grams to moles.
- 56. Use molar masses in calculations: moles to grams.
- 57. Determine percent composition.
- 58. Understand chemical analysis and mass percentages.
- 59. Determine empirical formulas.
- 60. Determine molecular formulas.
- 61. Review Dalton's Theory and chemical equations.
- 62. Do mole calculations from chemical equations.
- 63. Do mass calculations from chemical equations.
- 64. Identify limiting reactants.
- 65. Do calculations with limiting reactants.

- 66. Calculate percentage yields.
- 67. Understand visible light with regard to the electromagnetic spectrum.
- 68. Understand Bohr's theory of the atom.
- 69. Understand orbitals, electron shells, and subshells.
- 70. Understand electron configuration within subshells.
- 71. Demonstrate periodicity of electron configurations.
- 72. Use the Periodic Table to determine electron configurations.
- 73. Understand valence-shell configurations of main group elements.
- 74. Understand the metallic or nonmetallic character of an element.
- 75. Describe characteristic chemical properties of the main group elements.
- 76. Understand other trends in the Periodic Table.
- 77. Understand the concept of ionization energy.
- 78. Understand the formation of ionic bonds from atoms.
- 79. Use electron-dot symbols to show ionic bond formation.
- 80. Understand covalent bonding as a sharing of electron pairs.
- 81. Understand electronegativity and polar covalent bond formation.

#### Important dates:

All dates are subject to change!

Date	Event
9/2 (M)	Labor day holiday. No class today!
9/11 (W)	Test 1
10/2 (W)	Test 2
10/18 (F)	Lab exam #1
10/23 (W)	Test 3
11/1 (F)	Last day to withdraw (W) from CHM 101
11/13 (W)	Test 4
11/27-11/29 (W-F)	Thanksgiving holiday. No class or lab!
12/6 (F)	Lab exam #2
<b>12/11</b> (W) 9:30 AM - 11:30 AM	Cumulative final examination

For other administrative dates, such as the last day to drop a class and still receive a refund, please refer to the student information handout from the business office - available on the course web site at the following link:

http://scienceattech.com/?page\_id=1848