Instructor: Dr. Alycen P Nigro **Web: http://people.wcsu.edu/nigroa/**

Office: SB 305 **Phone: 203-837-8232** **Email: nigroa@wcsu.edu**

Office Hours: MW 11:00am – Noon and 2:00pm – 3:00pm; F 10:00am – 11:00am; other times by appointment.

"Concepts of Chemistry": CHE 100 is designed specifically for the student who lacks the required background in chemistry and/or mathematics to be successful in General Chemistry I (CHE110) or Survey of Chemistry (CHE120). This course prepares the student to enter either CHE110 or CHE120. This course not only provides background in chemical fundamentals but also enhances and hones the problem-solving strategies and quantitative skills of the student necessary for a successful career.

Dimensional analysis (aka: factor-label, unit-factor analysis, unit-label analysis, factor cancellation) method is **THE** method of approach used throughout this course and all subsequent chemistry courses. Resistance in learning this method while insisting on the "proportionality" approach is strongly discouraged.

Prerequisite: MAT098 (or its equivalent); MAT 098 is Elementary Algebra; **students who either need to take MAT 098 or are presently taking MAT 098 are not permitted in this course**

Co-requisite: MAT100 (or its equivalent) (Intermediate Mathematics); since CHE100 concentrates on basic chemical concepts and principles using a mathematical and quantitative approach, it is strongly recommended that MAT100 be passed **before** taking CHE100 but, at the very least, ***MAT100 must be taken concurrently with CHE100***

Gen Ed Requirement: CHE100 **DOES NOT** meet the General Education Requirements for a laboratory course. **IF THE REASON YOU ARE TAKING THIS COURSE IS TO FULFILL THE GENERAL EDUCATION (common core) REQUIREMENT FOR A LABORATORY SCIENCE, THEN YOU ARE IN THE WRONG COURSE !**

Lecture: MWF 1:00 – 1:50 PM SB 263

Recitation: Section 03 T 10:00 AM – 11:50 AM SB 263
Section 04 T 1:00 PM – 2:50 PM SB 263

Text: Basic Chemistry, Karen C. Timberlake, Second Edition, ISBN 0-8053-4469-1; this is the **required text** for the course.

Calculator: An inexpensive, non-programmable (~$10-15) hand-held scientific calculator with capability of doing logs, anti-logs, exponentials, squares and square roots is required.

Note: Prior to any quiz or exam given in this course, the memory registers in programmable calculators (e.g., TI 83, etc.) may well be cleared by the instructor.

Class format: The course lecture is "lecture driven" with the instructor using chalkboard and PowerPoint presentations. Occasional demonstrations will be carried out to supplement the material. The recitations are more informal in that students will have opportunity to ask questions. Frequently, student partnerships of two will be asked to put homework problems on the chalkboard during recitation.

Electronic Resources: The lecture materials and various handouts will be available from Dr. Nigro via the web at her website (http://people.wcsu.edu/nigroa/) and on eRES (the password is

"che100"). These materials will be in a PDF format and require Adobe Acrobat Reader for viewing (available on all WCSU computers).

Rules: The following are rules of lecture and/or recitation:

- Bring to all lecture and recitation sessions: A notebook, your textbook, two pencils and a scientific calculator.
  - If you do not have your calculator for a quiz or exam and need to borrow the instructors you will be docked points your quiz or exam grade.
- If you have a cell phone or pager, you MUST TURN IT OFF while in lecture and recitation. There is no phone call so important that these should be turned on during class.

Attendance: Attendance at both lecture and recitation sessions is **mandatory**! **ALL** quizzes and examinations (except for the final exam) are given during recitation periods.

Grading: The following is the exam schedule for the semester:

Exam 1	**September 25th during recitation period**
Exam 2	**October 23rd during recitation period**
Exam 3	**November 13th during recitation period**
Exam 4	**December 11th during recitation period**
Final Exam	**December 20th; 11:00am – 1:30pm**

There will be four exams during the course of the semester. Of these, the lowest score will be dropped. All exams except for the final will be held during the normal recitation periods.

The final exam will be **cumulative** and will count 1½ times as much as the other exams. The final exam is not eligible for dropping. However, if you receive an A- (90 or better) on **each of the four exams** during the semester, AND have an overall A- average (90 or better) in the course, you can **exempt the final**. The final exam will be taken on Thursday, December 20th at 11:00 am in Science Building 122.

There will be at least 10 quizzes given throughout the semester during recitation or as take-home quizzes. Of these quizzes, the **top 8 scores** will be counted towards your final grade.

The breakdown of the grading will be as follows:

3 exams @ 100 points each		300 points
Quizzes (Top 8 @ 20 pts each)		160 points
Comprehensive Final Exam		150 points
Recitation Participation		30 points
	Total	640 points

Test or quiz material will cover material up through the previous **Monday's lecture**. Expect a ~30 minute quiz at the end of every recitation period unless an examination is scheduled.

There will be **NO MAKE-UPS FOR MISSED QUIZZES OR EXAMS.** If an exam is missed for ***whatever reason***, you will receive a score of zero and that exam will count as the one dropped. You will also no longer be eligible for exemption of the final. If two exams are missed, you will receive a zero on both exams and one of the two scores will be dropped. The second zero will be used to determine your grade for the semester. It is very difficult to obtain the needed grade of "C" with a zero for an exam score. DO NOT MISS YOUR EXAMS.

Letter grades will be assigned on the following percentage basis:

A	93 – 100	B+	86 – 89	C+	73 – 77	D+	60 – 64
A-	90 – 92	B	82 – 85	C	69 – 72	D	55 – 59
		B-	78 – 81	C-	65 – 68	D-	50 – 54
						F	< 50

Any student whose final grade is a close borderline case will be given the benefit of the doubt, **except those:**

(1) whose performance is consistently and substantially low caliber
(2) with a poor attendance and/or tardiness record; a student with such a poor record is fortunate to have reached the level s/he has and no benefit of the doubt will be given (e.g., 77.9% = C+ not B-)
(3) who lacks preparation, participation and performance in recitation
(4) who is a consistent "grade grubber".

In addition to the four exams and the final, a standardized exam (the American Chemical Society Chemistry Placement Exam) will be given at the end of the course **(Friday, December 14th)**. It is **mandatory** that this exam be taken. If not taken on this date an incomplete (a grade of "INC") will be given. Your performance in this standardized exam will not count against you, but if you do well, it will be taken into account when the final grade is assigned. (Also, it's a great way to get ready for the cumulative final!)

Either a passing grade on this Chemistry Placement Exam or a C or better in CHE100 will allow you to enter the next chemistry course (CHE 110 or 120).

Students who major or minor in chemistry can not apply credit from this course towards meeting their chemistry course requirements. Other majors should consult with their department.

Class cancellations: Listen for weather advisories and school cancellations on the appropriate radio/TV station and/or call 203-837-9377. If a weather cancellation occurs on a Tuesday (recitation), the scheduled quiz or exam will be given at the next class meeting.

Withdrawal Policy: The last day to withdraw from the course without penalty (i.e., with a grade of "W") is **November 16th, 2007**.

Additional Help: Additional help is available from the instructors during office hours. In addition, the members of the **Chemistry Club** (located in **SB 318**) are available for one-on-one tutoring for a nominal fee (~$5/hour). If you are having difficulty with mathematical concepts, you can visit the **Math Lab** for help (Berkshire 105; check Math Department website for hours). There is no excuse for not understanding the materials if you make use of these sources of additional help.

Suggestions for Success in CHE 100:

Lecture:

- Pre-read the text for that day's lecture
- Know how to use your calculator (ask for help if you are unsure!)
- Attend lecture on time and take careful notes
- Recopy lecture notes as soon as possible after that lecture
- Re-read the text
- Actively do assigned problems faithfully, completely and independently
- Stay current, do not fall behind
- Ask questions
- Utilize the instructor's office hours and scheduled help sessions (the latter will precede each hourly exam)

- Review constantly
- Form or join a study group. The most successful students are those who help each other.
- Review your quizzes and exams; don't repeat your mistakes.
- Before starting a new chapter, review the summary at the end for key concepts.

Recitation:

- Do all the assigned problems
- Ask questions
- Attend on time and fully participate in the recitation (when chalkboard work is assigned, you will be graded on your
- preparation and performance, see **Grading Policy** above)

For start of the course **(start now)**: read the text Chapter 1
Chapter 2

Plan to spend **TWO** hours of concentrated study outside of class for each hour in class. This computes to a minimum of **TEN** hours/week for CHE 100.

This course, if successfully completed, will prepare you properly for either CHE110 or CHE120.

FOR **ALL** RECITATIONS, BRING TEXT, CALCULATOR AND AT LEAST TWO PENCILS WITH GOOD ERASERS.

Course Topics and Order for Course

Chapters	Topics
Mathematical Concepts Handout	Chemical Calculations
1	Introduction, Scientific Method
2	Measurement and Dimensional Analysis
3 (NOT 3.4-3.5)	Matter and Energy
4 (NOT 4.6)	Atoms and Elements
9	Electronic Structure and Periodic Trends
5	Names and Formulas of Compounds
10 (NOT 10.5-10.6)	Molecular Structure: Solids and Liquids
6	Chemistry Quantities
7 (NOT 7.5)	Chemical Reactions
8	Chemical Quantities in Reactions
11 (NOT 11.10)	Gases
12 (NOT 12.2; ADD 10.5)	Solutions
13 (13.1 – 13.4 ONLY)	Chemical Equilibrium
14	Acid-Base (Proton Transfer) Reactions
3, 7, 10 (3.4, 3.5, 7.5, and 10.6)	Energy in Chemical Reactions and Processes

Homework Assignments

Specific homework assignments are given next. These problems are **automatically** assigned when each chapter is begun. Answers to the odd numbers are given at the end of each chapter, so use these as a guide for working the even problems. It is crucial that you finish the problems **BEFORE** each recitation period. In recitation, you will be called upon to offer chalkboard answers to assigned problems.

Do the homework **faithfully, completely, successfully and independently**. Do not consult the method of solution in the text to a particular problem until you have completed that problem to the very best of your ability. The purpose of doing out-of-class problems is to get you into the practice of **actively** attacking problems and questions as well as honing problem-solving strategies. There are no short cuts to reading and deciphering problems. Success in this course is directly related to the effort put forth in this out-of-class work.

Chapter	Assigned Problems
1	11 - 14, 24, 26, 30
2	2, 4, 6, 8, 10, 12, 14, 16, 20, 22, 26, 30, 32, 34, 36, 42, 46 - 48, 54, 56, 58, 62ad, 64bc, 66acd, 72bde, 74bc, 79 - 82, 89, 94, 100, 110, 113 and this additional problem: A) Calculate the volume in cubic meters (m^3) of concrete that must be ordered for a new sidewalk 20 ft long by 36 inches wide by 4 inches thick.
3	2, 4, 6, 8, 10, 12, 16ace, 18, 50, 52, 54, 57, 58 AND on pgs 91-92 CI 2abcd, CI 3ab, CI 5 ab
4	2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 26, 28, 30, 32, 34, 36, 38, 42 - 44, 67, 70, 76, 78, 82, 84, 86, 99abc, 94, 97, 100, 108, 109
9	2, 10, 14 – 20, 22, 24 - 28, 32, 34, 36, 38 – 40, 42, 44, 46 – 50, 56, 58, 62, 64, 70, 72, 78, 86, 88, 90, 92, 96, 100, 102, 108, 110, 112, 116
5	2, 4acd, 6, 8 ,10, 12, 15 - 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 37bc, 38abce, 39, 40acde, 42, 44abce, 46bde, 48, 50, 52, 54, 56, 58, 60, 62, 74, 78, 80abcdg, 84, 88, 90, 92, 94, 100 and these additional problems: 1) Why is a potassium ion smaller than a potassium atom? 2) Which is larger in each of the following? a) Na or Na^+ b) S or S^{2-}

Chapter	Assigned Problems
	3) Why is a nitride ion larger than a nitrogen atom?
10	2, 4, 6, 10, 12 – 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 68, 70a, 72, 74, 76, 78, 82acde, 84bcd, 86, 93bd, 94
6	2, 4, 6bc, 8ac, 12, 14bc, 16bc, 18bcf, 20cd, 22ac, 24be, 26ade, 30abe, 32ac, 34acd, 36ad, 38bc, 40, 42ade, 44, 46, 48, 50, 54, 64, 70, 72c, 76, 78, 82ac AND on pgs 195-196 CI 6, CI 8, CI 9
7	2, 4, 6ab, 8cd, 12ac, 14cd, 16ce, 18, 20, 22, 24, 42, 44acf, 46, 48, 56
8	4b, 6b, 8, 10ac, 12ac, 14ab, 18, 22, 24b, 26c, 28, 30, 32, 40, 44, 52, 53 AND on pgs 250-251 CI 11, CI 12
11	2, 4, 7ac, 8ab, 10, 16, 18cd, 20, 24, 26, 28bc, 30, 32, 38, 40a, 42, 46a, 48cd, 50ad, 52, 54, 56, 58bd, 60, 62, 64, 84, 88, 92, 94, 108 and this additional problem: 1) When properly detonated, ammonium nitrate explodes violently, releasing hot gases: NH_4NO_3 (s) $\rightarrow$ N_2O (g) + 2 H_2O (g) If the total volume of the gases produced (N_2O and H_2O) is 82.3 L at 447°C and 896 torr, how many grams of NH_4NO_3 exploded (the 1995 Oklahoma City Bombing).
12	From Chapter 10: 41-44 2, 4, 6, 16, 18, 20, 22, 26, 30ac, 32bc, 34, 36c, 38ac, 40b, 42c, 44bc, 46ac, 48ab, 50, 52, 54, 66, 72, 74, 78, 82, 88, 92, 96
13	4, 6, 8, 10, 12ac, 14, 16bd, 21, 22, 51, 52, 56a, 73

Chapter	Assigned Problems
14	4, 6, 8, 10, 12, 14, 16, 27, 28, 30, 36, 38ac, 40bd, 44, 48, 50, 53, 54, 56, 60, 62, 64, 67, 68, 70, 72 – 74, 89, 92, 94, 96, 98, 100, 102, 109
Energy	From CHP 3:28, 30, 32b, 34bc, 36ad, 38ac, 40, 67, 74 From CHP 7: 25, 26, 28, 30 – 32, 50, 57 From CHP 10: 46, 48bc, 50ac, 52ad, 54, 62, 98