CHEM 158 – the chemistry of everyday things- the good, the bad and …

Instructor- Wayne Tikkanen,
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office hours.: MW 2-3:30 pm and by appointment

Meeting time: Monday and Wednesdays, 0420 – 0600 PM
Meeting Place: KH D-2022
BOTH CHEM 159 labs meet in MC3 (this is a room change for one section)

Text: "The Chemistry of Everything", Kimberley Waldron, Pearson/Prentice Hall Publishing – ISBN 0-13-008522-7

Other supplies: Z87 rated lab goggles or glasses required, lab coat or apron optional if taking CHEM 159

Course learning objectives.

- ∞ Understanding and being able to apply the scientific method
- ∞ Understanding the particulate nature of matter and its implications and ramifications
- ∞ Understanding the fundamentals of the atomic structure, in particular, "atomic identity" and isotopes.
- ∞ Being able to work the metric system prefixes and with numbers that are common in chemical systems (scientific notation).
- ∞ Developing a basic model for bonding within chemical substances.
- ∞ Using the particulate nature of matter and the conservation of matter in balancing chemical equations of reaction.
- ∞ To be able to quantify the amounts of chemical substances in the gas, liquid and solid phases using common units of measurement.
- ∞ To develop an appreciation for the importance of structure of molecules and their reactivity.
- ∞ To learn about some molecules present in everyday life and how their production has impacts on society. The molecules include, but are not limited to, polymers, food, pollutants and bio/psychoactive agents.

Grading Scheme.

Your grade in this class will be determined largely by the number of points that you earn in the following categories:

Midterm Exam	100
Final Exam	200
Homework	100
In Class Daily 25 Words	100
Total	500

The midterm exam will test your knowledge of the first four weeks of class and will be comprehensive. Both exams will contain questions that require quantitative reasoning (word problems), semi-quantitative reasoning (balancing equations and predicting trends) and essay questions.

Homework problems are listed in the syllabus and are due on the first class of the week due. These are considered a minimum effort to understand the work and trying further problems is highly suggested and encouraged. If you have problems solving homework questions, do not hesitate to see me at my office hours.

The "In Class Daily 25 Words" assignment are designed to have you learn about some molecules of contemporary interest- For each day of lecture class, there is some chemical substance listed-you are to write 25 original words about that substance and submit that sentence (or two or three) to me by email by the noon of that class day. Late arrivals will receive no points. Your summary should describe important properties and uses and have a structure of the molecule/substance.

I will post the class's work on a web site (anonymously, of course) for you all to peruse. I usually will have something to say about the substance for the day in class.

The planned schedule of topics and readings class by class is shown below in the table. Each block in the table is laid out in the following format:

Week #
Topic for Daily 25 words
Relevant text readings (section numbers)
Homework problems (week # due)
And/or **Events of note (exam, etc.)**

Schedule of Topics and Assignments

Week of	Monday	Wednesday
Jan 1	~~**No class (New Year's Day Holiday)**~~	1 *(no daily 25 topic)* 1.1-1.3, 6.3 Chpt1: 8,11,15,18,20,28,39 (#2)
Jan 8	1 *Radon (Rn)* 1.4-6	2 *lime or Calcium oxide, CaO* 2.1-5 Chpt2: 9,16,20,25,31,34,40 (#3)
Jan 15	2 ~~**No class (MLK holiday)**~~	3 *Nitrogen oxide (NO)*

Week of	Monday	Wednesday
		3.1-3.3 Chpt3: 4,5,7,8,15,18,19,30,31,32 (#4)
Jan 22	3 *ozone (O_3)* 3.3-3.7	4 *ethyne or acetylene, C_2H_2* 3.7-3.9 Chpt4:6,8,9,13,17,22,27,34,43 (#5)
Jan 29	4 *phosgene, $COCl_2$* 4.1-4.7	5 **Midterm Exam** Chpt5:5,6,7,11,12
Feb 5	5 *sodium thiosulfate, $Na_2S_2O_3$* 4.4-7; 5.1-2	6 *lithium battery* 5.4-8 Chpt5:18,19,23,24,28,35,45 (#7)
Feb 12	6 *plutonium, ^{239}Pu* 6.1-4	7 *polonium-210, ^{210}Po* 6.4-6 Chpt6:4,6,14,17,18,25,26,31,33,34,46 (#8)
Feb 19	7 *ammonia, NH_3* 7.1-3	8 *ethylene glycol* 7.4-7 Chpt7:8,9,11,12,14,18,21,25,31,32,37(#9)
Feb 26	8 *sarin* 8.1-4	9 *para-terephthalic acid* 8.4-8.7 Chpt8:2,9,14,17,21,22, 34,35,46(#10)
March 5	9 *1,6 hexanediamine* 10.1-6	10 *adenine* 11.1-5 Chpt10:9,10,17,18,21,36 Chpt11:7,9,10,33,34 Chpt12:7,8,18,23,36,40 Not to be handed in-Solutions posted 3/13
March 12	10 *aspartame* 12.4-6	**Final Exam-0430-0700 pm**