Application for CHEM 1211 - Honors General Chemistry I (Fall 2017)

Email this application by July 1, 2017 to Prof. Steele at ryan.steele@utah.edu

Course Information
CHEM 1211 is the Honors Section of General Chemistry and requires the lab course (CHEM 1240) as a co-requisite. The lecture section will be taught by Prof. Ryan P. Steele, and the lab section will be taught by Prof. Thomas G. Richmond. Only Thursday and Friday afternoon lab sessions are available. Students are also expected to complete the online Preparation for General Chemistry CHEM 1208 course immediately prior to fall semester.

Co-Requisite CHEM 1240 – Honors General Chemistry Lab I

Student Information
Name:___________________________ ID#:__________________________
Major:____________________________ Year at U:___________________

Are you a member of the Honors College? (circle)  Yes  No  I will join this coming year.

Please rank your preferred laboratory times by circling your choices (1 = highest preference):

Thursday  12:55-3:55pm  1 2 3
Friday   12:55-3:55pm  1 2 3
Friday   2:00-5:00pm  1 2 3

Please provide any of the following information that is applicable to you:

SAT scores:  Reading/Writing _______  Mathematics _______
ACT scores:  Math _____  Science _____  English _____  Reading _____  Writing _____
Overall high school GPA: _____ (out of ____)

High school courses passed (circle all that apply, and provide an Advanced Placement score, if appropriate):

Algebra  Biology  AP ___
Geometry  Chemistry  AP ___
Pre-Calculus  Physics  AP ___
Calculus I  AP ___  Botany
Calculus II  AP ___  Biochemistry  AP ___
Calculus III  Computer Programming
Other math: ______________________  Other science: __________________

Explain why you would like to join the Honors section of General Chemistry:
Problems
Write your answer in the space provided. If you do not know the answer, respond “unknown”.

1. Simplify the following expressions:
   (a) \(2^8 = \) ____________
   (b) \(10^{-3} = \) ____________
   (c) \(e^2 e^3 = \) ____________
   (d) \(\sqrt{10^9} = \) ____________

2. Solve for the indicated variable:
   (a) \(3x = 72\) \(x = \) ____________
   (b) \(\log_{10} x = -1\) \(x = \) ____________
   (c) \(4xy = 17y^2\) \(x = \) ____________
   (d) \(\sin(x) = 0\) \(x = \) ____________

3. Determine the result of the following expressions:
   (a) \(\sin\left(\frac{\pi}{2}\right) = \) ____________
   (b) \(\left[\cos\left(\frac{\sqrt{2}}{2}\right)\right]^{-1} = \) ____________
   (c) The \((x, y)\) coordinates of \(\theta = 150^\circ\) on the unit circle are ____________.

4. Determine the result of the following expressions:
   (a) The \((x, y)\) vector \((1, 2)\), when rotated 90 degrees counterclockwise, becomes ____________.
   (b) The \((x, y, z)\) vector \((0, 2, 1)\), when reflected through the \(xz\) plane, becomes ____________.

5. A load of garden mulch, with a volume of 4.0 cubic yards, is delivered to your home. In cubic inches, what is the volume of this delivery?
   \[\text{Volume} = \] ____________

6. The drive from Salt Lake City, UT to Denver, CO is 525 miles by interstate highway. At an average speed of 65 miles per hour—and without bathroom breaks—how many minutes would this drive take?
   \[\text{Time} = \] ____________ minutes

7. A diatomic nitrogen molecule—the dominant component in air—has a mass of \(4.65 \times 10^{-26}\) kg. At room temperature, its average speed is 515 m/s. In SI units, determine the average momentum of \(N_2\).
   \[\text{Momentum} = \] ____________

8. In the simplified chemical reaction \(A \rightarrow B\), the rate of the reaction depends on the concentration of species \(B\), denoted \([B]\), as ____________. (Select one answer.)
   (a) \(\frac{\text{d}[A]}{\text{d}t}\)
   (b) \(-[B]\)
   (c) \([B]^2\)
   (d) 0
   (e) \([B]([f])\)

9. A combustion reaction drives most modern automobile engines. Is the combustion of octane (gasoline) exothermic, endothermic, or cannot be determined? In one complete sentence, explain your reasoning.

Attach a pdf copy of your CHEMISTRY MINOR DARS report to this application.