



## Korea University International Summer Campus (KU ISC) 2022

*Embark on a unique summer*

June 28, 2022 ~ August 4, 2022

### ISC107 – General Chemistry I

#### I . Instructor

|                  |   |  |
|------------------|---|--|
| Professor        | : | Prof. Neil E. Schore   |
| E-mail           | : | <a href="mailto:neschore@ucdavis.edu">neschore@ucdavis.edu</a> |
| Home Institution | : | University of California, Davis                                |
| Class Time       | : | Period 2, 10:30 – 12:10 KST                                    |
| Office           | : | 305 Woodang Hall (if in person, when not teaching)             |
| Office Hours     | : | Available by email all the time                                |

#### II. Textbook

|                   |   |  |
|-------------------|---|--|
| Required Textbook | : | Petrucci et al., General Chemistry, 10 <sup>th</sup> Edition or later (Pearson 2011)<br>ISBN-13: 978-0132064521 (or any comparable textbook) |
|-------------------|---|--|

#### III. Course Description and Objectives

A one-semester lecture-only course in General Chemistry suitable for students majoring in all disciplines. Upon completing this course students should comprehend what we mean by atoms and elements, how they combine into chemical compounds, and how to distinguish compounds from mixtures. Students should gain facility with the methods of measurement, with special emphasis on the mole concept. They should be able to recognize types of chemical change and how to set up and balance chemical equations. Students should be able to handle calculations involving the behavior of gases under various conditions of temperature and pressure. Students should be able to specify the detailed make up of atoms and the distribution of electrons in orbitals with specified quantum numbers. They should be able to read the electron configurations of the atoms of the elements from their position in the periodic table and qualitatively predict the physical nature of each element and its chemical behavior. Students should be able to describe the types and electronic makeup of the chemical bonds in compounds, with special emphasis on the Lewis model of bonding. They should be able to predict the geometry about an atom in a molecule using the VSEPR concept. Students should be able to relate VSEPR geometry to orbital hybridization and the types of atomic orbitals involved. They should be able to construct simple molecular orbital schemes for homodiatomic molecules of the first- and second-row elements. Students should be able to describe the thermodynamics of a system using the concepts of heat, work, and enthalpy. They should know the properties of solids, liquids and gases, their interconversions, and the principles that apply to solutions. They should know the meaning of equilibrium and be able to determine the direction and extent that a reaction proceeds using Le Chatelier's principle and ICE tables.

#### IV. Grading

|            |   |   |
|------------|---|---|
| Attendance | : | Attendance in at least 70% of class sessions is required to pass. |
| Exam I     | : | 33 1/3%   |
| Exam II    | : | 33 1/3%   |
| Exam III   | : | 33 1/3%   |

#### V. Class Outline (timing of chapter coverage is approximate)

Time permitting, review sessions based on old exams will be held during the class immediately preceding each exam day. **In order to make this possible, we may move faster through some chapters than this schedule indicates.**

| Date                 | Topic  | Chapter      | Remarks |
|----------------------|--|--------------|---------|
| June 28 (Tue)        | Orientation Day (no classes)                         |              |         |
| June 29 (Wed)        | Matter: Properties and Measurement; Atoms            | 1, 2         |         |
| June 30 (Thu)        | Atoms and Atomic Theory                              | 2            |         |
| July 1 (Fri)         | Chemical Compounds                                   | 3            |         |
| July 4 (Mon)         | Chemical Compounds; Chemical Reactions               | 3, 4         |         |
| July 5 (Tue)         | Reactions in Aqueous Solutions                       | 5            |         |
| July 6 (Wed)         | Reactions in Aqueous Solutions; Gases                | 6            |         |
| July 7 (Thu)         | Gases; Review for Exam I                             | 6            |         |
| July 8 (Fri)         | TENTATIVE: Additional Review for Exam 1              | 1–6          |         |
| <b>July 11 (Mon)</b> | <b>Exam I</b>  | <b>1–6</b>   |         |
| July 12 (Tue)        | Electrons in Atoms                                   | 7            |         |
| July 13 (Wed)        | Electrons in Atoms; The Periodic Table               | 7, 8         |         |
| July 14 (Thu)        | The Periodic Table                                   | 8            |         |
| July 18 (Mon)        | Chemical Bonding I                                   | 9            |         |
| July 19 (Tue)        | Chemical Bonding II                                  | 10           |         |
| July 20 (Wed)        | Chemical Bonding II; Thermochemistry                 | 10, 11       |         |
| July 21 (Thu)        | Thermochemistry; Review for Exam II                  | 11           |         |
| <b>July 25 (Mon)</b> | <b>Exam II</b>                                       | <b>7–11</b>  |         |
| July 26 (Tue)        | Intermolecular Forces: Liquids and Solids            | 12           |         |
| July 27 (Wed)        | Intermolecular Forces: Liquids and Solids            | 12           |         |
| July 28 (Thu)        | Solutions and their Physical Properties              | 13           |         |
| Aug 1 (Mon)          | Solutions; Principles of Chemical Equilibrium        | 13, 14       |         |
| Aug 2 (Tue)          | Principles of Chem. Equilibrium; Review for Exam III | 14           |         |
| <b>Aug 3 (Wed)</b>   | <b>Exam III</b>                                      | <b>12–14</b> |         |
| <b>Aug 4 (Thu)</b>   | <b>Graduation; no class</b>                          |              |         |