

## Fall Semester, 2024

### General Chemistry II

(Special Topics on 'MetalloChemistry in Biology')

**1. Course: General Chemistry II (CH103)** [Lecture: Experiment: Credit = 3:0:3]

#### 2. Lecture Timetable

| Time<br>(Tue / Thurs) | Class | Professor  | Lecture Room (E11)           |
|-----------------------|-------|------------|------------------------------|
| 13:00-14:30           | A     | Mi Hee Lim | Creative Learning<br>B/D 201 |

#### 3. Summary of Lecture

This is an elective introductory course in chemistry that introduces how existing chemical concepts are applied to the latest research findings.

##### Target Students:

1. Students who intend to major in chemistry / materials / life sciences.
2. Students who want to study chemistry in more depth.
3. Students who wish to experience and understand the latest research findings in chemistry.

#### 4. Materials for Teaching

- Petrucci's General Chemistry: Principles and Modern Applications. 12 ed, Petrucci/Herring/Madura/Bissonnette, Pearson Education
- Principles of Modern Chemistry, 8<sup>th</sup> ed, Oxtoby/Gillis/Campion (Brooks/Cole)
- "Principles of Bioinorganic Chemistry", Lippard and Berg, University Science Books, 1994: Main Textbook
- "Biological Inorganic Chemistry (Structure & Reactivity)", Bertini, Gray, Stiefel, and Valentine, University Science Books, 2007.
- The lecture materials prepared by the professor.
- Lecture materials are provided through the KLMS website of each class (<https://klms.kaist.ac.kr/>).

#### 5. Evaluation Criteria (will be managed centrally)

- 1) Grading: A-F

- 2) There is a minimum score requirement for each subject based on a 100-point scale. If the minimum requirement is not met, an **F grade** will be given.

The breakdown of points is as follows:

I. Mid-term Exam: 30 points

II. Final Exam: 30 points

III. Homework: 20 points

- Summary: Chapter 8 and the lectures on 9/3, 9/5, 10/29, & 10/31  
(3 points for Chapter 8 and the lectures, maximum of 3 pages)
- Chapter problem: 5 points (Chapter 8)

IV. Attendance & Attitude: 20 points

- Maximum of 20 points (1 point for each attendance of lectures)

V. Plagiarism of Homework and Exams:

- First instance: Warning with a deduction of 5-10 points, second instance: F grade

## 6. Lecture Schedule

| Week<br>(Tue,<br>Thur)               | Chapter #  | Topics   | Due date for<br>Homework<br>(Chap.<br>Summary &<br>problem) | Practice<br>session<br>(Mon,<br>20:00 ~<br>20:50) |
|--------------------------------------|--|--|---|---|
| 1 <sup>st</sup><br>(9/3, 9/5)        |  | <b>Two Lectures</b> on<br>Chemical Strategies on<br>Multiple Facets in<br>Alzheimer's Disease  |   |   |
| 2 <sup>nd</sup><br>(9/10,<br>9/12)   | Petrucci's<br>General<br>Chemistry<br>(Chapters 23/24)<br>// Principles of<br>Modern<br>Chemistry<br>(Chapter 8) | The Transition Elements<br>/ Complex Ions and<br>Coordination<br>Compounds<br><br>Bonding in Transition<br>Metal Compounds and<br>Coordination Complexes | <b>Two<br/>Lectures</b><br>(Fri, ~23:59)                    |   |
| 3 <sup>rd</sup><br>(9/17 or<br>9/19) |  | <b>9/17</b> National Holiday<br><b>9/19</b> Complex Ions and<br>Coordination<br>Compounds  |   |   |
| 4 <sup>th</sup><br>(9/24,<br>9/26)   | Chapter 24<br><br>Petrucci's<br>General  | <b>9/24</b> Complex Ions and<br>Coordination<br>Compounds  | <b>Chap 23/24</b><br>(Fri, ~23:59)                          | Practice<br>session (O)                           |

## SYLLABUS and COURSE INFORMATION

|   |  |   |  |   |
|---|--|---|--|---|
|   | Chemistry<br>(Chapter 16)                            | <b>9/26</b> Chemical<br>Equilibrium   |  |   |
| 5 <sup>th</sup><br>(10/1,<br><b>10/3</b> )        | Chapters 16/17                                       | <b>10/1</b> Chemical<br>Equilibrium / Acids and<br>Bases<br><br><b>10/3</b> National Holiday  |  |   |
| 6 <sup>th</sup><br>(10/8,<br>10/10)               | Chapter 17<br><br>MetalloChemistry<br>in Biology - I | <b>10/8</b> Acids and Bases<br><br><b>10/10</b> Basic Concepts in<br>Bioinorganic Chemistry   | <b>Chap 16/17</b><br>(Fri, ~23:59)       | Practice<br>session (O)                     |
| 7 <sup>th</sup><br>(10/15,<br>10/17)              | MetalloChemistry<br>in Biology - I                   | <ul style="list-style-type: none"> <li>• Choice and Uptake of <math>M^{n+}</math> Ion</li> <li>• Metallochaperones:<br/>Metal Folding,<br/>Crosslinking</li> </ul>      |  |   |
| 8 <sup>th</sup><br>(10/23,<br>Wen)                | Mid-term<br>(19:00 ~ 21:00)                          | (Chapters 14/23/24 and<br>MetalloChemistry - I)   |  |   |
| 9 <sup>th</sup><br>(10/29,<br>10/31)              |  | <b>Two Lectures</b> on<br>Protein-Protein<br>Interactions Associated<br>with Alzheimer's Disease  |  | <b>Note:</b><br>10/29<br>(Midterm<br>Claim) |
| 10 <sup>th</sup><br>(11/5,<br>11/7)               | MetalloChemistry<br>in Biology - II                  | <ul style="list-style-type: none"> <li>• Electron Transfer</li> <li>• Dioxygen: Oxygen<br/>Carrier</li> </ul>   | <b>Two<br/>Lectures</b><br>(Fri, ~23:59) |   |
| 11 <sup>th</sup><br>(11/12,<br>11/14)             | MetalloChemistry<br>in Biology - III                 | <ul style="list-style-type: none"> <li>• Dioxygen: Fe</li> <li>• Dioxygen: Cu</li> </ul>  |  | Practice<br>session (O)                     |
| 12 <sup>th</sup><br>(11/19,<br>11/21)             | MetalloChemistry<br>in Biology - IV                  | <ul style="list-style-type: none"> <li>• Non-redox<br/>Metalloenzymes</li> <li>• Dinuclear<br/>Metalloenzymes /<br/>Model Complexes for<br/>Metallohydrolase</li> </ul> |  |   |
| 13 <sup>th</sup><br>(11/26,<br>11/28)             | MetalloChemistry<br>in Biology - V                   | Metal-Nucleic Acid<br>Interaction   |  | Practice<br>session (O)                     |
| 14 <sup>th</sup> ( <b>12/3</b> ,<br><b>12/5</b> ) |  | Study week (No class)   |  |   |
| 15 <sup>th</sup><br>(12/10,                       | Q/A<br>Research<br>Introduction                      | Chemical Strategies to<br>Study Multiple Facets in<br>Dementia  |  |   |

## SYLLABUS and COURSE INFORMATION

|                                     |                               |                               |  |  |
|-------------------------------------|-------------------------------|-------------------------------|--|--|
| 12/12)                              |                               |                               |  |  |
| 16 <sup>th</sup><br>(12/18,<br>Wen) | Final Exam<br>(19:00 ~ 21:00) | (MetalloChemistry - I &<br>V) |  |  |