



---

**National Taiwan University of Science and Technology**

**2018 Summer Program**

**CHEM 101 Introduction to Chemistry with Lab**

**Course Outline**

**Course Code: CHEM 101**

**Instructor: TBA**

**Home Institution: TBA**

**Office Hours: TBA and by appointment**

**Email: TBA**

**Credit: 4**

**Course Description:**

*Introduction to Chemistry* will provide students with an overview of the current trends and body of knowledge in Chemistry, including basics of the scientific method and of the analysis of scientific data.

**Course Objectives:**

The main course goal is to allow students to reach a comprehensive understanding of the issues and methods in Chemistry, in order to decide whether to pursue studies in the field. In the process of reaching this goal, our objectives are that each student will:

- Become familiar with current scientific theories and research in the major topic areas of Chemistry;
- Discover the personal relevance of course material in their everyday and professional lives, in order to make fully informed decisions;
- Develop the skills necessary to evaluate and think critically about information concerning biological

phenomena obtained from research, the general public, and the media;

- Be well prepared for advanced courses in Chemistry/Life Sciences.

### **Required Textbooks**

Introductory Chemistry, David Ball, ISBN 13: 978-1-4533110-7-3, Saylor Foundation.

<https://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=22>

Several readings will be required throughout the course, either to prepare for class or to complete an assignment. Additional material will be posted online to provide a free and easy access to everyone.

### **Grading & Evaluation:**

Assignments/Labs (30%) – Midterm exam (30%) – Final exam (40%)

Intermediary assignments will be posted throughout the course, to help students assess their needs and to ensure that all the important topics are well understood. Assignments and labs are also an opportunity for students to ask questions concerning unclear notions, as the main objective is not to grade but to help everyone reach an optimal level of comprehension.

Midterm and final exams will target all topics previously covered in class. Lecture notes, labs and assignments are important to succeed in the midterm and final exams, yet some questions will be specifically intended to stimulate students' critical thinking.

Attendance is extremely important for success in this class. It is expected that each student will commit fully to the assignments and readings required. Exams will cover the required texts as well as material presented or discussed in class.

### **Course Schedule (tentative):**

#### **Week 1:**

Lecture 1: Course Introduction – Syllabus

Lecture 2: Chemistry: Methods and Measurements

*LAB 1: Experimental designs*

#### **Week 2:**



Lecture 3: The Scientific Method: Basics & Core Principles

Lecture 4: Experimental Design in Science

Lecture 5: Atom and Periodic Table

Review Session

*LAB 2: Hypothesis testing*

### **Week 3:**

MIDTERM

Lecture 6: Chemical Equation and Calculations

Lecture 7: Matter and Solutions

Lecture 8: Energy, Rate and Equilibrium

*LAB 3: Data analysis*

### **Week 4:**

Lecture 9: Acids and Bases and Oxidation-Reduction

Lecture 10: Organic Chemistry

Lecture 11: Biological Chemistry

Lecture 12: Cell Division & Differentiation

*LAB 4: Personal project*

### **Week 5:**

Lecture 13: Analyzing Scientific Data

Review Session

Lecture 14: General Review

FINAL EXAM

Final Exam Q&A – Course Wrap-up