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**National Taiwan University of Science and Technology**

**2020 Summer Program**

**CHEM 101 Introduction to Chemistry with Lab**

**Course Outline**

**Term: July 06-August 07,2019**

**Class Hours: 10:00-11:50 (Monday through Friday)**

**Course Code: CHEM 101**

**Instructor: Dr. Rodriguez**

**Home Institution: American University**

**Office Hours: 1:00PM to 1:30PM (Monday through Friday) and by appointment**

**Email: srodrigu@american.edu**

**Credit: 4**

**Class Hours:** According to the regulations of Minister of Education, R.O.C, 18 class hours could be counted as 1 academic credit in all universities in Taiwan. This course will have 72 class hours, including 40 lecture hours, professor 10 office hours, 10-hour TA discussion sessions, 2-hour review sessions, 10 laboratory hours.

**Course Description:**

Introduction to Chemistry is a general introduction to chemistry, which is the study of matter and the changes it undergoes. In this course, you will learn the language of chemistry by using chemical symbols, formulas and equations, and use this language to understand the composition of materials, their structures and properties and related energy conversions. We will also cover practical applications of chemistry to problems involving environmental pollution, energy sources and human health. To keep up with the changing times, concepts of sustainability and green chemistry will also be addressed. Overall, skills gained in this course can be exceptionally useful in many aspects of your life.



## Course Objectives:

After successfully completing this class, students will be able to:

1. Recognize that all matter is comprised of atoms, which have constant proportionality within molecules.
2. Demonstrate a basic understanding of chemical measurement.
3. Present a qualitative understanding of atomic and molecular structure, and the properties that arise from those structures.
4. Identify properties associated with chemical change.
5. Utilize the skills and methods learned in the course to make a logical argument or connection to a broader problem.
6. Explain the importance of chemistry in everyday life.

## Required Textbook and Materials:

1. Required Textbook: The Molecular World by OpenStax College (Adapted by Michele Lansigan) © 2016 by Adapted at American University (downloadable FREE OF CHARGE at <http://chem100textbook.openbooks.wpengine.com/>)
2. Scientific Calculator

## Grading & Evaluation:

Criteria	Points
Homework	20%
Midterm	20%
Lab	25%
Final Exam	35%
<b>TOTAL</b>	<b>100%</b>



- Lectures will cover course material and the homework for the week will be related to the material covered in those lectures. You will be responsible for completing the assigned readings and homework prior to each lecture.
- Weekly homework will be given based on the material covered in class and practice problems in the textbook. It will be approximately 10 problems per week.
- Exams will cover the material discussed in class and homework problems. The final exam will be comprehensive, covering material from the entire 5 weeks. ONLY scientific calculator will be allowed for exams.
- The lab is designed to develop the ability to integrate concepts and analyze scientific data.
- Since your ideas and perspectives are a valuable part of the course dialogue, students are expected to attend class and remain in attendance for a full class period. Partial attendance means coming late, leaving early, or leaving and returning for a prolonged period of time within one session. If you are 15 minutes late, you are considered absent

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

	<b>Date</b>	<b>Topic</b>
Week 1	Lecture 1	Course Introduction / Chapter 1: Essential Ideas in Chemistry
	Lecture 2	Chapter 2: Atomic Theory and Structure
	<i>Lab</i>	<i>Literature Review</i>
Week 2	Lecture 3	Chapter 3: Electronic Structure
	Lecture 4	Chapter 4: Chemical Bonds
	Lecture 5	Chapter 5: Composition and Solutions
	<i>Lab</i>	<i>Experiment Proposal</i>
Week 3	Lecture 6	Chapter 6: Stoichiometry of Chemical Reactions
	Lecture 7	Practice Problems
	Lecture 8	Midterm
	<i>Lab</i>	<i>Collecting Data</i>
Week 4	Lecture 9	Midterm
	Lecture 10	Chapter 7: Acid and Bases
	Lecture 11	Chapter 8: Gases
	<i>Lab</i>	<i>Data Analysis</i>
Week 5	Lecture 12	Chapter 8: Electrochemistry



	Lecture 13	General Review
	Lecture 14	Final Exam
	<i>Lab</i>	<i>Writing Scientific Report</i>

