



**Department of Geology**

**College of Science**

**University of Salahaddin**

**Subject: Rock Forming Minerals**

**Course Book (2<sup>nd</sup> class)**

**Lecturer's name Dr. Waleed Sulaiman Aswad Shingaly**

**Academic Year: 2019/2020**

# Course Book

1. Course name	Rock Forming Minerals
2. Lecturer in charge	Dr. Waleed Sulaiman Aswad
3. Department/ College	Geology/College of Science
4. Contact	e-mail: waleed.aswad@su.edu.krd Tel: (optional): 07504479241
5. Time (in hours) per week	Theory: 2 Practical: 12
6. Office hours	20 hours per week
7. Course code	
8. Teacher's academic profile	1. Very recently Salahaddin University established a university web site (su.edu.krd) which secure our e-mails and its privacy 2. Research Gate: It helps scientific communication between people of the same field of specialization. 3. LinkedIn: This is another method for communication between fellow scientists all over the world. 4. Google scholar: It helps scientific communication between people and helps to see the latest papers and researches of the same field of specialization.
9. Keywords	Minerals, Crystals, Chemistry

## I. COURSE GOALS & OBJECTIVES

Since minerals are the basic building blocks of earth materials, this course is designed to give the student a fundamental background in minerals, necessary to understand earth materials. The student will learn the basic principles behind the arrangement of atoms to form crystal structures, how these atoms are coordinated and bonded and how this is reflected in the external form, chemical composition, and physical properties of the crystals.. The student will learn how to identify the most common minerals in hand specimen and, by using optical techniques, learn how to identify the common minerals in thin section.

## II. TEXTBOOKS

There are two required textbooks for this course. The first is required reading for the course and the second is a general reference that you will also use in Petrology next semester.

1. Klein - *Manual of Mineral Science*, 23<sup>rd</sup> edition, by Cornelis Klein and Barbara Dutrow. This text covers crystallography, crystal structure, and crystal chemistry and has useful mineral identification tables. It will be used extensively for lectures at the beginning and end of the

course.

2. DHZ - *An Introduction to the Rock Forming Minerals*, 2nd Edition, by W.A. Deer, R.A. Howie, and J. Zussman. This is a general reference text covering identification of minerals with the petrographic microscope. It will be used in the lab during the second half of the course .

### III. COURSE GRADING

The course grade will be determined on the basis of the number of points scored out of a possible 100 points. These points will be apportioned as follows:

Theory.	15	Practical	35	50%
Final Theory.	50	Practical	00	50%
				100%

#### **IV. Learning Outcomes for this Course**

1. The student will gain an understanding of how atoms interact to form minerals and how the structure and chemical composition of minerals determine the properties and occurrence of minerals.
2. The student will learn how to identify the common minerals in hand specimen.
3. The student will learn how to identify the common rock forming minerals in thin section

## **v. Course Syllabus**

	<b>Subject</b>
	<b>Rock Forming Minerals</b>
<b>1.</b>	<b>Atoms</b>
<b>2.</b>	<b>Bonds</b>
<b>3.</b>	<b>Coordination and Pauling's Rules</b>
	<b>Mineral Chemistry</b>
<b>4.</b>	<b>Twinning, Polymorphism, Polytypism, Pseudomorphism</b>
<b>5.</b>	<b>Mineral Stability and Phase Diagrams</b>
<b>6.</b>	<b>TWO COMPONENT (BINARY) PHASE DIAGRAMS</b>
<b>7.</b>	<b>Silicate Structures, Structural Formula, Neso-, Cyclo-, and Soro- Silicates</b>
<b>8.</b>	<b>Inosilicates (Pyroxenes and Amphiboles)</b>
<b>9.</b>	<b>Phyllosilicates (Micas, Chlorite, Talc, &amp; Serpentine)</b>
<b>10.</b>	<b>Tectosilicates,</b>
<b>11.</b>	<b>Carbonates, Oxides, &amp; Accessory Minerals</b>
<b>12.</b>	<b>Weathering &amp; Clay Minerals</b>
<b>13.</b>	<b>X-ray</b>