

Ministry of Higher Education and Scientific research



**Department of: Earth Sciences and Petroleum**

**College of: Science**

**University of: Salahaddin**

**Subject: Mineralogy**

**Course Book: 1<sup>st</sup> Year**

**Lecturer's name: Baran Hasan Mustafa (M.Sc.)**

**Academic Year: 2023/2024**

# Course Book

<b>1. Course name</b>	<b>Mineralogy</b>
<b>2. Lecturer in charge</b>	<b>Baran H. Mustafa (M.Sc.)</b>
<b>3. Department/ College</b>	<b>Department of Earth Sciences&amp; petroleum/ College of Science</b>
<b>4. Contact</b>	<b>e-mail: baran.mustafa@su.edu.krd Tel: 07504728561</b>
<b>5. Time (in hours) per week</b>	<b>practical: 2 hours four groups (8 hours)</b>
<b>6. Office hours</b>	<b>5-6 hours</b>
<b>7. Course code</b>	
<b>8. Teacher's academic profile</b>	I graduated from University of Salahaddin on 2005, and then I got the M.Sc. in geochemistry from the same university in 2015. From 2015 till now I gave many courses in the Department of Geology/ Science College and General science department/ Basic education College such as Mineralogy, Geochemistry, and minerals &Rocks.
<b>9. Keywords</b>	<b>Science, minerals, elements</b>
<b>10. Course overview:</b>	<p>This course focuses on the study of minerals, its definition, classes, chemical composition, and physical properties. Classification of the minerals is very important in the study of the minerals. There are many bases for classification of the minerals but we focus in this course on the classification that is based on the nature of the anion group. Accordingly, there are eight classes of minerals. Each class is classified to subclasses, groups, and species; the common minerals will be studied. Physical properties, crystal system, chemical properties, and occurrence of these common minerals will be studied in details.</p>
<b>11. Course objective:</b>	<p>The successful student in this course will achieve the following:</p> <ul style="list-style-type: none"> <li>• Understand and familiarize with eight classes of minerals, minerals property, teaching them how to identify mineral samples.</li> <li>• Calculation of chemical composition of oxide and non-oxide minerals.</li> </ul>
<b>12. Student's obligation</b>	<p>Students are expected to attend class regularly each week on exact time. Attendance and participation will be considered in the final grade. Students are expected to be prompt, attentive and prepared for lab. Students that arrive late for an exam will not be permitted to take the exam. Students must prepare a report at the end of the lab.</p>
<b>13. Forms of teaching</b>	<p>Different forms of teaching will be used to reach the objectives of the course:</p> <ul style="list-style-type: none"> <li>• Power point presentations for the titles, definitions and mineral classes, all figures, chart, table that related to the minerals. The classroom discussions at the beginning of the lab for the previous subject.</li> <li>• To get the best of the course, it is recommended that you attend each lab as much as possible, read all about minerals, and try save mineral information and names. Try as much as possible to participate in classroom discussions.</li> </ul>

**14. Assessment scheme**

Exams will be comprehensive, meaning that each exam will cover all material that precedes it. The exam has 35 marks (20 exams, 5 quiz, and 10 reports+ absent).

**15. Student learning outcome:**

This course is intended to be the undergraduate student's course in mineralogy. Mineralogy provides information about chemical compositions of the outer part of the earth (crust), (upper part of mantle), and the rocks. The industrial uses of the minerals and rock; and this assume the student to get information for the future when they do research about minerals or explorer an area for determining the industrial minerals.

**16. Course Reading List and References:**

1. Allaby, M., Coenraad, R.R., Hutchinson, S., McGhee, K., O'Byrne, J., Rubin, K. (2008) The Encyclopedia of Earth, A Complete Visual Guide. Weldin Owen Group, Sydney, Australia. 608p.
2. Busch, R. M. (2006) Laboratory manual in physical geology. 7<sup>th</sup> Edition, Pearson Prentice Hall, Upper Saddle River, New Jersey. 302p.
3. Coenraad, R.R. (2008) Rocks & Fossils A visual Guide. 2<sup>nd</sup> Edition, Firefly Book, USA. 304P.
4. Klein, C. Cornelius, S. Hurlbut, Jr. (1985) Manual of Mineralogy. 20<sup>th</sup> Edition, John Wiley & Sons, New York, Chichester, Brisbane, Toronto, Singapore. (After James D. Dana) 596 p.
5. Sen, G. (2001) Earth's Materials Minerals and Rocks. 1<sup>st</sup> Edition, Prentice Hall, Upper Saddle River, New Jersey. 542p.
6. Plummer, C. C. McGary, D. Carlson, D. H. (2005) Physical Geology. 10<sup>th</sup> Edition, McGraw-Hill, New York. 580p.

**17. The Topics: Practical Mineralogy courses**

**Week 1: Mineral chemistry calculation**

Definition and concept of mineral- Naming of mineral- Minerals chemistry calculation.

**Week 2: Mineral chemistry calculation- Oxide minerals**

Calculating weight %, Chemical formula of oxide minerals.

**Week 3: Physical properties of Mineral**

Colour, Lustre, Cleavage, Fracture, Transparency

**Lecturer's name**

Baran H. Mustafa

2 hours

2 hours

2 hours

<p><b>Week 4: Silicate Minerals</b></p> <p>Tectosilicate and Phyllosilicates – Subclasses</p> <p><b>Week 5: Silicate Minerals</b></p> <p>Inosilicate, Cyclosilicate and Sorosilicate- Subclasses</p> <p><b>Week 6: Silicate Minerals</b></p> <p>Nesosilicate Subclass</p> <p><b>Week 7: Examination</b></p> <p><b>Week 8: Native Class</b></p> <p>Subclasses- groups- basic properties</p> <p><b>Week 9: - Sulphide class</b></p> <p>Subclasses- groups- basic properties</p> <p><b>Week 10: Oxide and Hydroxide, Halide Classes.</b></p> <p>Characteristics of minerals, Classification</p> <p><b>Week 11: Carbonates, Sulphate classes</b></p> <p>Mineral properties, Classification</p> <p><b>Week 12: Phosphate class.</b></p> <p>Classification, important of phosphate minerals.</p> <p><b>Week 12: Examination</b></p>	<p>2 hours</p> <p>2hours</p> <p>2 hours</p> <p>2 hours</p> <p>2 hours</p> <p>2 hours</p> <p>2 hours</p> <p>2 hours</p> <p>2 hours</p>
<p><b>19. Examinations:</b></p> <p><b>Q/ Write the chemical composition of this mineral?</b></p> <p><b>Q/ For this mineral write:</b>  <b>Colour:</b>  <b>Transparency:</b></p> <p><b>Q/ Write name of this mineral?</b></p> <p><b>Q/ What type of silicate structure (Subclass) you expect for this mineral?</b></p> <p><b>Q/ Write down two bases for naming mineral?</b></p>	

**20. Extra notes:**

The type of exam is different, because the whole course is about studying samples of minerals, the student in the exam is moving around 15 to 20 questions, and has 2 minutes to answer each question.

**21. Peer review**

Prof. Dr. Faraj H. Tobia