



Course Syllabus (Academic Year 2020)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KAGS 381 Geochemistry
Credit (study hours) : 2 (2-0-4)
2. **Program Name** : Bachelor of Science in Geoscience
3. **Course Module** : 1st semester of 3rd year
Pre/co-requisite : SCCH 136
4. **Class Semester** : 1st Semester 2nd Semester Academic Year 2020
5. **Class Schedule & Venue** : 13.00 – 15.00, Online course by Cisco Webex Meetings Program
6. **Class Coordinator** : Dr. Patchawee Nualkhao
 Contact No. 092-9042292 Email : patchawee.nua@mahidol.edu

7. Course Description

Origin and distribution of the chemical elements, geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere, chemical weathering of earth material and soil geochemistry, mobilization of elements and geochemical processes, origin of solid fuel (coal and oil shales) and petroleum, advance chemical analysis in Geochemistry

8. Course Objectives / Course Learning Outcomes (CLOs)

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
8.1	Students can explain the origin of earth and distribution of the chemical elements and the geochemical cycles operating in the earth's atmosphere, hydrosphere and lithosphere.	Basic knowledge	Analytical thinking	Fundamental knowledge	2, 3, 4
8.2	Students can understand in chemical weathering of earth material and soil geochemistry and can explain the origin of solid fuel (coal and oil shales) and	Basic knowledge	Analytical thinking	Chemical weathering and source of energy	2, 4, 5

	petroleum.				
8.3	Students can explain the properties of the elements that make up the whole earth and the associated chemical processes.	Basic knowledge	Analytical thinking	Fundamental knowledge	2, 3, 4
8.4	Students can explain the distribution of the elements on the earth and can select appropriate advanced instrument for chemical analysis.	Basic knowledge	Analytical thinking	Instrumental analysis	2, 3, 4, 5
8.5	Students are be able to work effectively with the team members.	Basic knowledge	Reasonable	Application of fundamental knowledge	1, 4, 5

9. Class Instructor List

9.1 Name : Dr. Patchawee Nualkhao Contact No. : 092-9042292 Email : patchawee.nua@mahidol.edu

9.2 Name : Dr. Waraporn Threeprom Contact No. : 083-7784445 Email : wthreeprom@yahoo.com

10. Course Outline (based on reference sheet)

Week	Date	Contents	CLOs	Instructor's Names
1	3 Jul 2020	Introduction to Geochemistry	1, 2	<u>Dr. Waraporn Threeprom</u>
2	10 Jul 2020	Ionic Equilibria	1, 2	<u>Dr. Waraporn Threeprom</u>
3	17 Jul 2020	Chemical Weathering	2, 3	<u>Dr. Waraporn Threeprom</u>
4	24 Jul 2020	Structural Chemistry	2, 3	<u>Dr. Waraporn Threeprom</u>
5	31 Jul 2020	Eh – pH diagram	2, 3	<u>Dr. Waraporn Threeprom</u>
6	7 Aug 2020	Eh – pH diagram and Organic materials in sediments	2, 3	<u>Dr. Waraporn Threeprom</u>
7	14 Aug 2020	Organic materials in sediments	2, 3	<u>Dr. Waraporn Threeprom</u>
8	21 Aug 2020	Carbonate Equilibria	2, 3	<u>Dr. Waraporn Threeprom</u>
9	Mid-term Examination			
10	4 Sep 2020	The properties of elements	3, 4	<u>Dr. Patchawee Nualkhao</u>
11	11 Sep 2020	Trace elements in igneous processes	3, 4	<u>Dr. Patchawee Nualkhao</u>

12	18 Sep 2020	Fractionation of stable isotope	3, 4	Dr..Patchawee.Nualkhao
13	25 Sep 2020	Geochronology and radiogenic tracers	3, 4	Dr..Patchawee.Nualkhao
14	2 Oct 2020	The chemistry of natural waters	3, 4	Dr..Patchawee.Nualkhao
15	9 Oct 2020	Mineral reactions	3, 4	Dr..Patchawee.Nualkhao
16	16 Oct 2020	Geochemical Instrumentation and Analysis	3, 4, 5	Dr..Patchawee.Nualkhao
17	Final Examination			

11. Course Assessment (based on reference sheet)

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Mid-term exam	Online Exam by Cisco WebEx Meeting and Google Classroom	1-2	9	30
11.2	Final exam	Online Exam by Cisco WebEx Meeting and Google Classroom	3-5	17	30
11.3	Quiz	Online questions during Online Class by Cisco WebEx Meeting	1-5	1-8, 10-16	10
11.4	Reports / Assignments	Online Presentations	1-5	1-8, 10-16	20
11.5	Class participation	Must be greater than 80%	1-5	1-8, 10-16	10
				Total	100

12. Grading System (based on reference sheet)

Criterion-referenced evaluation

Grade	Score	Grade	Score	Grade	Score	Grade	Score
A	≥ 80 %	B	70 – 74.99%	C	60 – 64.99%	D	50 – 54.99%
B+	75 – 79.99%	C+	65 – 69.99%	D+	55 – 59.99%	F	< 50 %

Norm-referenced evaluation

*If use both criterion and norm-referenced evaluation, please tick two boxes.

13. References

13.1 Albarède, Francis. (2003). *Geochemistry: An Introduction*. 10.1017/CBO9781139165006.

13.2 W.M. White, 2013, *Geochemistry*, Wiley-Blackwell. 668p.

13.3 K.B. Krauskopf and D.K. Bird, 1989, *Introduction to Geochemistry*, 3rd Ed., McGRAW-HILL International Editions, Earth & Planetary Sciences Series.

13.4 W.S. Fyfe, 1974, *Geochemistry*, Oxford Chemistry Series, General Editors; P.W. Atkins, J.S.E. Holder and A.K. Holliday, Oxford University Press.