



Course Syllabus (Academic Year 2017)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

- Course No. and Title** : KAGS 311 PETROLOGY
Credit (study hours) : 2 (2-0-4)
- Program Name** : Bachelor of Science Program in Geoscience
- Course Module** : Term 1/ Year 3
Pre-requisite : KAGS 216 Petrography and Ore Microscopy
Pre-requisite : KAGS 214 Petrography and Ore Microscopy Laboratory
Co-requisite : KAGS 312 Petrology Laboratory
- Class Semester** : 1st Semester Academic Year 2020
- Class Schedule & Venue** : 09:30 – 11:30, Monday
- Class Coordinator** : Piyatida Sangtong
Email : Piyatida.san@mahidol.edu

Meeting Information

<https://mahidol.webex.com/mahidol/j.php?MTID=m88661f37872e274336dba6c4103b2065>

Meeting number: 166 873 8876

Password: XZpKsiep522

Host key: 451159

7. Course Description

การใช้ส่วนประกอบทางแร่และสมบัติทางเคมีในการจำแนกหินอัคนี หินแปร และหินตะกอน รวมถึงกระบวนการต่างๆ ทางธรณีวิทยาแปรสัณฐานที่ทำให้เกิดชนิดหินต่างๆ เหล่านั้น

Classification, mineralogy, and chemical properties of igneous, metamorphic, and sedimentary rocks including the tectonic processes by which they formed

8. Course Objectives / Course Learning Outcomes (CLOs)

No.	Objectives / CLOs	Expected Skills / Knowledge		
		Specific	Generic	Knowledge
8.1	Identify each of the different types and the major minerals the make up igneous, sedimentary and metamorphic rocks.	Basic science Material	Observant	Lithology Sedimentology Crystal and Mineralogy
8.2	Explain the origin of each of the different rock types and their geologic history in a language of rocks under microscopic.	Basic science Material	Writing Presents	General Geo Geochemical Geophysical

8.3	Explain the relationship of each rock types to geological processes including the plate tectonic model by thin section	Earth Processes	Analytical thinking	Comprehensive to origin of each rock types and earth processes
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กฤษฎศ ๓๑๑ ศีลาวิทยา	ผลลัพธ์การเรียนรู้ที่คาดหวังของหลักสูตร (PLOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1 จำแนกชนิดหินและแร่จากข้อมูลทางธรณีเคมี ลักษณะทางกายภาพ และแร่องค์ประกอบของหินได้	1.1, 1.2		3.1		
CLO2 อธิบายลักษณะและการเกิดของหินและแร่แต่ละชนิดจากข้อมูลองค์ประกอบหินได้	1.1, 1.3		3.1		
CLO3 เลือกใช้ข้อมูลและเครื่องมือในการวิเคราะห์และจำแนกชนิดหินได้เหมาะสม	1.5		3.2		

9. Class Instructor List

9.1 Name : Prinya Putthapiban Email :

9.2 Name : Piyatida Sangtong Email : Piyatida.san@mahidol.edu

10. Course Outline

Week	Date	Contents	Instructor's Names	
1	6 July	Course overview Introduction: Petrology in the 21 st century; Chemical composition and mineralogy of Earth's layers	Piyatida Sangtong	VDO
2	13 July	Igneous environments Igneous minerals and textures Chemistry and classification of igneous rock	Prinya Putthapiban Piyatida Sangtong	VDO
3	20 July	Styles of Plutonic and Volcanic rocks Extraterrestrial volcanism	Prinya Putthapiban Piyatida Sangtong	Online + VDO
4	27 July	Origin and evolution of magmas : Fractional crystallization and contamination Petrology of the mantle	Prinya Putthapiban Piyatida Sangtong	Online + VDO
5	3 Aug	Igneous rocks of the oceanic lithosphere, convergent margins and continental lithosphere.	Prinya Putthapiban Piyatida Sangtong	Online + VDO

		Examination			
6	10 Aug	Definition of metamorphic rock and type of metamorphism Metamorphic minerals, structures and textures in metamorphic rocks metamorphic rocks	Prinya Putthapiban Piyatida Sangtong		Online + VDO
7	17 Aug	Metamorphic facies concept: Nomenclature and facies series	Prinya Putthapiban Piyatida Sangtong		Online + VDO
8	24 Aug	Metamorphic reactions Stability of mineral assemblages reactions and equilibrium in metamorphic rocks	Prinya Putthapiban Piyatida Sangtong		Online + VDO
9	7 Sep	Metamorphic phase diagrams Metamorphic fluid-metasomatism and dynamic metamorphism Metamorphic classification : metamorphism of mafic and ultramafic igneous rocks, aluminous clastic rocks and calcareous rocks	Prinya Putthapiban Piyatida Sangtong		Online + VDO
		Midterm Exam			
10	14 Sep	Introduction to occurrence and classification of sedimentary rocks Type of sedimentary rocks and depositional basins, weathering and plate tectonics	Prinya Putthapiban Piyatida Sangtong		Online + VDO
11	21 Sep		Prinya Putthapiban Piyatida Sangtong		Online + VDO
12	28 Sep	Clastic rock classification Sand and sand stones; framework grains; mudrocks; clay mineralogy	Prinya Putthapiban Piyatida Sangtong		Online + VDO
13	5 Oct	Carbonate diagenesis: meteoric settings and burial settings	Prinya Putthapiban Piyatida Sangtong		Online + VDO
14	12 Oct	Chemical and biochemical sedimentary rocks: chert, phosphorite, evaporates Interpreting siliciclastic sedimentary rocks, Iron-rich rocks and coals	Prinya Putthapiban Piyatida Sangtong		Online + VDO
		Final Examination			

11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Assignments / Readings / Quiz	Online + VDO		1 – 15	40
11.2	Examination			5, 9, 15	40
11.3	Report/Presentation			1 – 15	20
				Total	100

12. Grading System

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 %

13. References

- 13.1 Blatt, Harvey, and Robert J. Tracy. 1995. Petrology: Igneous, Sedimentary, and Metamorphic, 2nd ed. New York: W.H. Freeman.
- 13.2 Cox, K. G., Bell, J. D., and Pankhurst, R. J., 1979, The Interpretation of Igneous Rocks: London, England, George Allen & Unwin, Ltd., 450 p.
- 13.3 Hatch, F. H., Wells, A. K., and Wells, M. K., 1972, Petrology of the Igneous Rocks: London, England, Thomas Murby & Co, 551 p.
- 13.4 Mason, R (1978) Petrology of the Metamorphic Rocks. George Allen & Unwin, London, 254pp.
- 13.5 Moorhouse, W.W., 1959, The study of rocks in thin section: Harper and Brother, New York, 514 pp.
- 13.6 Nesse, William D. (1991) Introduction to Optical Mineralogy, 2nd Edition: New York, Oxford University Press, 335 p.
- 13.7 Williams, H., Turner, J., F., Gilbert, and M., C., 1954, Petrography, An Introduction to the Study of Rocks in Thin Section: San Francisco, W.H. Freeman and Company.