



Course Syllabus (Academic Year 2020)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KAGS 301 (Structural Geology)
Credit (study hours) : 3(3-0-6)

2. **Program Name** : Bachelor of Science Program in Geoscience

3. **Course Module** : Required course (Year III)
Co-requisite : KAGS 303 (Structural geology laboratory)
Pre-requisite : KAID 260 (Mathematics for Earth Scientists) and
: KAGS 260 (Regional Geology Field Study)

4. **Class Semester** : 1st Semester 2nd Semester Academic Year 2020

5. **Class Schedule & Venue** : Monday, 13:30 – 16:30 (Online)

6. **Class Coordinator** : Narongsak Kaewdum
: Contact No.: 089-0406016
: Email: narongsak.kae@mahidol.ac.th

7. Course Description

This course covers all principles on structural geology, i.e., geometry, types of structures of rocks and how do they form. The study also covers how force / stress create strain on rock of various types of different behavior that have been resulted in various types of structures including folding and faulting of rocks found on the earth's crust. The subject also include application of structural geology in local area. Also the subject includes geological resource exploration as well as the analytical and stereographic techniques on rock structure failures. The optimum planning of construction that based on different types of rock structures.

8. **Course Objectives / Course Learning Outcomes (CLOs):** students will have the knowledge and skills to

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
8.1	Recognize, map and interpret the geological structure using a variety of techniques including geological field observations, drill-hole data, remotely sensed data (including geophysical datasets) and microstructural analysis.	General Geo, Geoscience knowledge, Mapping	Communication skills & 3D visualization, Analytical thinking	Lithology, Mineralogy, Tectonic, Geomorphology	1, 2
8.2	Interpret the relative timing of formation, the kinematics of deformation and the progressive deformation histories of structures.	3-D visualization/ imagination, Mapping	Analytical thinking	Tectonics	1, 2, 3
8.3	Predict the geometry and location of structures at depth or in areas of poor outcrop.	3-D visualization/ imagination,	Analytical thinking,	Petrology	1, 2, 3
8.4	Apply an understanding of structural geology in the mining and resource exploration environment.	3-D visualization/ imagination	Analytical thinking	Mineralogy, Tectonics,	1, 3
8.5	Analytical techniques on rock Structure stability using stereographic method.	3-D visualization/ imagination	Analytical thinking	Petrology, Tectonics	1, 2, 3

9. **Class Instructor List**

9.1 Name: Narongsak Kaewdum, M.Sc

Contact No. 089-040-6016

Email: narongsak.kae@mahidol.ac.th

9.2 Name: Prof. Emeritus Sanga Tangchawal, Ph.D

Contact No. 089-122-9659

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10. Course Outline

Week	Date	Contents	CLOs	Instructor's Names
1	13 Jul 20	Introduction		Narongsak Kaewdum
2	20 Jul 20	Kinematic Analysis and Deformation		Narongsak Kaewdum
3	27 Jul 20	Dynamic Analysis: Stress & Strain		Narongsak Kaewdum
4	3 Aug 20	Fundamentals of Structural Geology		Narongsak Kaewdum
5	10 Aug 20	Structural Geology: Joints and Cleavages		Narongsak Kaewdum
6	17 Aug 20	Structural Geology: Faults and Folds		Narongsak Kaewdum
7	24 Aug 20	Structural Geology: Shear Zone and Microstructure		Narongsak Kaewdum
8	Mid-term Examination			
9	7 Sep 20	Safe and Stability on Rock Structures in the field		Dr.Sanga Tangchawal
10	14 Sep 20	Techniques on Compiled Data on 3-D Using Stereographic Method		Dr.Sanga Tangchawal
11	21 Sep 20	Field Joints and Other Rock Fractures		Dr.Sanga Tangchawal
12	28 Sep 20	Plane and Wedge Failure in Rocks		Dr.Sanga Tangchawal
13	5 Oct 20	Toppling Failure in Rocks		Dr.Sanga Tangchawal
14	12 Oct 20	Case Application on Stability of Rocks Using Stereographic Method (1)		Dr.Sanga Tangchawal
15	19 Oct 20	Case Application on Stability of Rocks Using Stereographic Method (2)		Dr.Sanga Tangchawal
16	26 Oct 20	Case Application on Stability of Rocks Using Stereographic Method (3)		Dr.Sanga Tangchawal
17	Final Examination			

11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Mid-term exam	Paper Assessment		8	30
11.2	Final exam	Paper Assessment		17	30
11.3	Quiz / Assignment	Homework			10
11.4	Reports / Assignments	Field Excursion Group Report			20
11.5	Class participation				10
				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 %

Norm-referenced evaluation

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

13. References

13.1 Billings, M.P., 1972. Structural Geology, Prentice-Hall, USA, 606 p.

13.2 Davis, G.H. & Reynolds, S.J., 1996. Structural Geology of Rocks and Regions, John Wiley & Sons, Inc. New York, 776 p.

13.3 Fossen, H., 2016. Structural Geology. Second Edition, Cambridge University Press, 510 p.

13.4 Priest, S.D., 1985. Hemispherical Projection Method in Rock Mechanics, George Allen & Unwin (Publishers) Ltd., London, 124 p.

13.5 Twiss, R.J. & Moores, E.M., 2007. Structural Geology, W.H. Freeman and Company, Canada, 736 p.

13.6 Wilson, G., 1982. Introduction to Small-Scale Geological Structures, George Allen & Unwin (Publishers) Ltd., London, 128 p.