COURSE SPECIFICATION

Name of institution Mahidol University

Campus/faculty/department International College

Section 1 General Information

1. Course code and course title

Thai ICGN 123 โครงสร้างทางพลวัตของโลก

English ICGN 123 The Earth's Dynamic Structure

2 Number of Credits 4 (3-2-7) (Lecture/Lab/Self-study)
(lecture 3 hours/week; laboratory 2 hours/week; self study 7 hours/week)

3. Curriculum and type of subject

3.1 Curriculum offered in all International College undergraduate curriculums:
Bachelor of Arts, Bachelor of Science, Bachelor of Business Administration, Bachelor of Engineering, Bachelor of Nursing Science

3.2 Type of subject Elective course in Natural Science for General Education Required course for environment majors

4. Responsible faculty member Dr. Prinya Putthapiban

5. Trimester / year of study

5.1 Trimester 2/2021-22

5.2 Number of students 30 students

6. Pre-requisites none

7. Co-requisites none

8. Venue of study Mahidol University, Salaya Campus (On site) or Online

9. Date of latest revision January, 2022

Section 2 Goals and Objectives

1. Goals

• To introduce students to the fundamental concepts and applications of geology.

• To help students understand earth systems and processes including rock formation, weathering, erosion and formation of landforms.

• To help students understand earth movements including plate tectonics and crustal deformation.

2. Objectives of development/revision

To keep course content up-to-date and relevant to current state of knowledge in this field and improve pedagogy.

Section 3 Course Management

1. Course descriptions

หลักการเบื้องต้นของธรณีวิทยาและการประยุกต์ใช้ หลักการธรณีวิทยาทางกายภาพ เน้นที่กระบวนการ
ต่างๆ ที่เกิดในระดับผิวโลก และลึกเข้าไปจากผิวโลก รวมถึงกระบวนการกำเนิดของหิน และชั้นหิน ภูมิอากาศ
และการผุกร่อน การกก่อตัวของภูมิประเทศ และการสลายตัวของเปลือกโลก

Introducing fundamental concepts and applications of general geology at a beginning level. Basic concepts of physical geology, emphasizing surficial and deep earth processes, including mineral and rock formation, plate tectonics, weathering and erosion, formation of landscapes, and crustal deformation.

2. Credit hours / trimester

Lecture (Hour)	**Additional class (Hour)**	**Laboratory/field trip/internship (Hour)**	**Self study (Hour)**
36 (3 hours x 12 weeks)		24 hours (2 hours x 12 weeks)	- 84 hours (7 hours x 12 weeks)

3 Number of hours that the lecturer provides individual counseling and guidance

48 hours (1 hour / week)

Section 4 Development of Students' Learning Outcome

1. Expected outcome on students' skill and knowledge

Students will be able to apply and synthesize knowledge from the lecturer and self-study to better understand the importance of geology.

2. Teaching methods

Course is taught using lectures, demonstrations and discussion. Teaching materials include lecture notes, texts, specimens, documents and visual aids.

3. Evaluation methods

1. Morality and Ethics

1.1 Expected outcome on morality and ethics

* (1) Perceive importance of morality, ethics, and integrity
* (2) Have discipline, self and social responsibility
* (3) Have a positive professional attitude and communicate their morality and ethics to others
* (4) Take responsibility to participate in development activities
* (5) Can adjust to work in team both as leader or follower
* (6) Respect and follow institutional and societal rules and regulations
* (7) Respect other people's right and are a good listener

1.2 Teaching methods

Learning Centered Education: Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

(1) Lecture
(2) Case studies with past experiences and current events
(3) Emphasis on morality and ethics
(4) Group discussion

1.3 Evaluation methods

(1) Written midterm and final examinations
(2) Project display and Geological Field Excursion
(3) Class attendance, class participation and class behavior
(4) On time submission of all work

2. Knowledge development

2.1 Expected outcome on knowledge development

* (1) Knowledge of fundamental concepts and applications of geology

* (2) Knowledge of earth processes including mineral and rock formation.

* (3) Knowledge of earth movements

2.2 Teaching methods

Learning Centered Education: Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

(1) Lecture

(2) Demonstrations and laboratories

(3) Emphasis on knowledge development

(4) Group discussion

2.3 Evaluation methods

(1) Written midterm and final examinations

(2) Assignments, project display and geological field excursion

(3) Class attendance, class participation and class behavior

(4) On time submission of all work

3. Intellectual development

3.1 Expected outcome on intellectual development

* (1) Have analytical thinking

* (2) Can apply theoretical and practical knowledge to their real life activities

* (3) Can apply knowledge and skill to solve problems and synthesize solutions and foresee and forestall issues

3.2 Teaching methods

(1) Teaching based on real experience that encourages development of general skills, not only professional skills

(2) Assignments, discussions and presentations

3.3 Evaluation methods

(1) Written midterm and final examinations

(2) Assignments

4. Interpersonal relationship and responsibility

4.1 Expected outcome on Interpersonal relationship and responsibility

* (1) Express opinions appropriately

* (2) Can work effectively in teams as both leader and follower

* (3) Self development in academic and professional careers

* (4) Have responsibility for assignments

4.2 Teaching methods

(1) Group participation in display project and geological field excursion

(2) Assignment of group and individual reports

(3) Encourage use of real-life experience and current events in teaching

4.3 Evaluation methods

(1) Observed attitudes during display

(2) Appropriate behavior in class

(3) Responsibility for attendance and participation

(4) Respecting report and assignment deadlines

(5) Responsible to submit highest possible quality work

5. Mathematical analytical thinking, communication skills, and information technology skills

5.1 Expected outcome on mathematical analytical thinking, communication skills, and information technology skills

* (1) Can use effective communication skills (Listening, Speaking, Reading, and Writing) to communicate with others

* (2) Can use information technology for communication and presentation in appropriate ways

* (3) Develop analytical skills

☑ (4) Develop skills to search information from the Internet

☑ (5) Have information technology skills for communication such as e-mail, instant messaging, social networking and on-line collaboration

5.2 Teaching methods

(1) Lectures and notes with hyperlinked content

(2) Discussion of case studies in class

(3) Self-study assignments using on-line resources

(4) Reports and assignments that emphasize quantitative data and statistics from reliable sources

5.3 Evaluation methods

(1) Written, midterm and final examinations

(2) Assignments

Section 5 Teaching and Evaluation Plans

1. **Teaching plan**

Week	Topic	Hours	Teaching methods/multimedia	Instructor
1	**Introduction and agreement** Chapter 1 : Earth As A System Chapter 2 : Minerals : definition & formation	4	Textbook and handouts	Prinya Putthapiban
2	**Chapter 2 : Minerals : identification & classification**	4	Textbook and handouts	
3	Chapter 3 : Igneous Rocks Chapter 4 : Sedimentary Rocks	4	Textbook and handouts	
4	Chapter 5 : Metamorphic Rocks	4	Textbook and handouts	
5	Chapter 6 : Crustal Deformation Chapter 7 : Structural Geology	4	Textbook and handouts	

Week	Topic	Hours	Teaching methods/multimedia	Instructor
6	Chapter 9 : Weathering & Erosion **REVIEW**	4	Textbook and handouts	
7	**Midterm exam** FIELD EXCURSION	2 2		
8	Chapter 10 : Mass Wasting Chapter 11 : Stream Features	4	Textbook and handouts	
9	Chapter12: Groundwater Features Chapter 13: Glacier Features	4	Textbook and handouts	
10	Chapter 14 : Ocean Features Chapter 15 : Coastal Landforms	4	Textbook and handouts	
11	Chapter 16: Desert Features Chapter 17: Economic Geology and Geology of Thailand	4	Textbook and handouts	
12	Chapter 18 : Medical Geology & Earth Environment Geologic Project Display	4	Textbook and handouts	

Week	Topic	Hours	Teaching methods/multimedia	Instructor
	REVIEW			
13	**Final exam**	2		

2. Evaluation plan

Expected outcomes	Methods / Activities	Week	Percentage
	Interest and participation	1-12	10 %
	Midterm examination	7	30 %
	Final examination	13	40 %
	Field excursion	7	10 %
	Geological project display	12	10 %

Section 6 Teaching Materials and Resources

1. Texts and main documents

15. References

1) Ojakangas, R.W., 1991, Introduction to Geology, New York: McGraw Hill, 294 pp.
2) Tarbuck, E.J. and Lutgens, F.K., 1984, The Earth; An Introduction to Physical Geology, Bell & Howell Company, 594 pp. QE28.2 T35E1984
3) Walker, R.G., 1984, Facies Models, Second Edition, Geoscience Canada, Reprint Series 1, 317 pp.
4) Skinner, B.J. and Porter, S.C., 2000, The Dynamic Earth; An Introduction in Physical Geology, Fourth Edition, John Willey and Sons, 575 pp.

2. Documents and important information

Additional readings set by the instructor.

3. Documents and recommended information

Additional readings set by the instructor.

Section 7 Evaluation and Improvement of Course Management

1. Strategies for effective course evaluation by students

1.1 Student evaluation of own performance (online)

1.2 Student evaluation of course quality (online)

(1) Course content

(2) Course management

(3) Suggestions

(4) Overall opinion

1.3 Faculty or supervisor evaluation of course quality

(1) Course content

(2) Course management

(3) Suggestions

(4) Overall opinion

2. Evaluation strategies in teaching methods

2.1 Student evaluation

2.2 Faculty or supervisor evaluation

3. Improvement of teaching methods

At least annual course improvement meeting between lecturers and supervisor.

4. Evaluation of students' learning outcome

Analysis of students' learning outcomes using scores from class attendance, assignments and examinations.

5. Review and improvement for better outcome

Regular communication between lecturers and supervisor to review the course before term starts and throughout term as needed.

Section 6 Teaching Materials and Resources

1. Texts and main documents

1) ……...

2) ……...

3) ……...

4) ……...

5) ……...

6) ……...

2. Documents and important information

1) ……...

2) ……...

3) ……...

4) ……...

3. Documents and recommended information

1) ……...

2) ……...

3) ……...

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5) ……...

6) ……...

7) ……...

8) ……...

Section 7 Evaluation and Improvement of Course Management

1. **Strategies for effective course evaluation by students**

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2. **Evaluation strategies in teaching methods**

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3. **Improvement of teaching methods**

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4. **Evaluation of students' learning outcome**

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5. **Review and improvement for better outcome**

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Course Syllabus

1. Program of Study	Bachelor of Science
Faculty/Institute/College	Faculty of Science, International College Mahidol University
2. Course Code	ICGN 123
Course Title	The Earth's Dynamic Structure, Sections 1 & 2
3. Number of Credits	4 (3-2-7) (Lecture/Lab/Self-study)
4. Prerequisite	None
5. Type of course	Required
6. Session/Academic Year	3 / 2019 - 2020
7. Course Condition	30 students

8. Course Description

Introducing fundamental concepts and applications of general geology at a beginning level. Basic concepts of physical geology, emphasizing surficial and deep earth processes, including minerals & rocks and their formations, crustal deformation, plate tectonics, weathering and erosion, formation of landscapes, geologic resources and environmental geology.

9. Course Objectives

After successful completion of this course, students will be able to

9.1 understand geology of minerals and rocks

9.2 understand geological science, geological processes and geological features

9.3 would appreciate our nature much more and help look after them in future

9.4 work as a team and care for others

10. Course Outline

Week	Topic	Hours			Instructor
		Lectures	Lab	Self study	
1.	Introduction and agreement Chapter 1 : Earth As A System	2.0	0.0	4	Prinya Putthapiban
1.	Chapter 2 : Minerals : definition & formation	1.5	0.5	4	Prinya Putthapiban

2.	**Chapter 2 : Minerals : identification & classification**	1.5	0.5	4	Prinya Putthapiban
2.	**Chapter 2 : Minerals : identification & classification**	1.5	0.5	4	Prinya Putthapiban
3.	**Chapter 3 : Igneous Rocks**	1.5	0.5	4	Prinya Putthapiban
3.	**Chapter 4 : Sedimentary Rocks**	1.5	0.5	4	Prinya Putthapiban
4.	Chapter 5 : Metamorphic Rocks	1.5	0.5	4	Prinya Putthapiban
4.	Chapters 3,4 & 5 : Review	1.5	0.5	4	Prinya Putthapiban
5.	Chapter 6 : Crustal Deformation	1.5	0.5	4	Prinya Putthapiban
5.	Chapter 7 : Structural Geology	1.5	0.5	4	Prinya Putthapiban
6.	Chapter 8 : Geologic Time Scale	1.5	0.5	4	Prinya Putthapiban
6.	Chapter 9 : Weathering & Erosion	1.5	0.5	4	Prinya Putthapiban
7.	**Midterm Examination** To be confirmed				
Sunday	**Field Excursion** : To be confirmed Reading of Topographic and Geologic Maps of Thailand	-	11	11	Prinya Putthapiban
8.	Chapter 10 : Mass Wasting	1.5	0.5	4	Prinya Putthapiban
8.	Chapter 11 : Stream Features	1.5	0.5	4	Prinya Putthapiban

9.	Chapter 12 : Groundwater Features	1.5	0.5	4	Prinya Putthapiban
9.	Chapter 13: Glacier Features	2.0	0.0	4	Prinya Putthapiban
10.	Chapter 14 : Ocean Features	2.0	0.0	4	Prinya Putthapiban
10.	Chapter 15 : Coastal Landforms	1.5	0.5	4	Prinya Putthapiban
11.	Chapter 16: Desert Features	1.5	0.5	4	Prinya Putthapiban
11.	Chapter 17: Economic Geology and Geology of Thailand Chapter	1.5	0.5	4	Prinya Putthapiban
12.	Chapter 18 : Medical Geology & Earth Environment	2.0	0.0	4	Prinya Putthapiban
12.	REVIEW	2.0	0.0	4	Prinya Putthapiban
13.	Geologic Project Display	-	2.0	4	Prinya Putthapiban
13.	Geologic Project Display Date : to be confirmed Time : 8 -16 hrs	-	2.0	4	Prinya Putthapiban Invited Referees
	Final Examination To be confirmed				Prinya Putthapiban
	Total	36	24	107	

11. Teaching Method

Lecture, discussion, geological field excursion, project display and self-study

12. Teaching Media

Texts and teaching materials including mineral and rock specimens, Computer program presentation, topographic maps and geological maps of various scales and DVD.

13. Measurement and Evaluation of Student Achievement

Student's achievement will be graded according to the college and university standard using the symbols:

$A = \geq 90$

$B^{+} = \geq 85$

B	=	≥ 80
C^+	=	≥ 75
C	=	≥ 70
D^+	=	≥ 65
D	=	≥ 60
F	=	< 60
I	=	incomplete (given only under extreme circumstances

Grade Structure

Interest and participation	10 %
Field excursion	10 %
Geological project display	10 %
Midterm examination	30 %
Final examination	40 %

14. Course Evaluation

14.1 Students' achievement as indicated in number 13 above.

14.2 Students' satisfaction towards teaching and learning of the course using questionnaires.

15. References

5) Ojakangas, R.W., 1991, Introduction to Geology, New York: McGraw Hill, 294 pp.

6) Tarbuck, E.J. and Lutgens, F.K., 1984, The Earth; An Introduction to Physical Geology, Bell & Howell Company, 594 pp. QE28.2 T35E1984

7) Walker, R.G., 1984, Facies Models, Second Edition, Geoscience Canada, Reprint Series 1, 317 pp.

8) Skinner, B.J. and Porter, S.C., 2000, The Dynamic Earth; An Introduction in Physical Geology, Fourth Edition, John Willey and Sons, 575 pp.

16. Instructor(s)

Dr. Prinya Putthapiban

17. Course Coordinator

Dr. Prinya Putthapiban

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18. Remark I

Field excursion and the geological project displays and/or presentations are considered to be practical / laboratory hours

19. Remark II

- During the COVID-19 Pandemic situation, MU and other universities (both Thai and international) introduce the online teaching and learning approaches & policies.
- In order to comply with the above guideline and to maintain the standard as well as to reach the objectives of the course, the following alternatives have been made for the laboratory, field excursion and the geological project display.
  a) Laboratory on the earth materials: Minerals and Rocks
     Students will be provided with descriptions and photos of the common mineral and rock samples. A set of the actual samples can be borrowed from the instructor for self studied and online coaching.
  b) Field excursion : The activity will be replaced by the two 2 hours lectures on the Geology of Satun Geopark, Thailand, a UNESCO Global Geoparks, Geology of the Dinosaur sites in Northeastern Thailand, and many others distinctive geological features around the country.
  c) Geological Project Display : Students are asked to form a team of two to four and work on an assigned topic (to be discussed) through online communication. Discussion and exchanging of information among all teams will be made during the later part of the semester. Each team need to submit their power point presentation to the instructor via email prior to the final exam date.

20. Remark III

- This online teaching and learning approaches will be carried out until the university announce the resumption of normal teaching policy.