GE1313: EARTHQUAKES

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Earthquakes

Subject Code
GE - Gateway Education
Course Number
1313

Academic Unit
Architecture and Civil Engineering (CA)

College/School
College of Engineering (EG)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

GE Area (Primary)
Area 3 - Science and Technology

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

This course introduces students to earthquakes in aspects related to science, engineering and the society. Science aspects include the origin of earthquakes and their geographical distribution, how they propagate through the earth crust and affect human beings. Engineering and social aspects cover the common methods used for quantifying and monitoring earthquakes, their damage on constructed facilities, preparedness and disaster mitigation strategies. Teaching and learning activities include formal lecture, discussion, and experimental demonstration. Students from all disciplines are welcome. Students shall pursue a topic of their own interest and background in a group project with presentation, which will allow them to consolidate the materials learnt in the course for learning development in their own discipline of focus.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the overall earthquake process and implications, including the origin, geographical distribution, seismic wave propagation and attenuation.	20	x		
2	Describe common scales used for quantifying earthquakes, the principles involved; and interpret earthquake events in news and earthquake monitoring websites.	20	x		
3	Describe the primary effects of an earthquake event to human beings; how constructed facilities are damaged and common solutions adopted for buildings and lifeline facilities.	20	x		
4	Describe the secondary effects of an earthquake event to human beings, e.g., landslides, tsunami and post-earthquake fire.	10	x		
5	Describe existing preparedness and disaster mitigation strategies against earthquake risks.	10	x		
6	Develop an approach to understand and discover earthquake related issues of personal interest; and explain to public audience in a comprehensible manner	20		x	

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Students will attend formal lectures to gain knowledge about the overall earthquake process and seismic wave phenomena.	1, 2	
2	Lecture	Students will engage in formal lectures to obtain knowledge regarding experimental demonstration of seismic wave phenomena.	1	
3	Lecture	Students will engage in formal lectures to learn knowledge about earthquake magnitudes and intensities and to participate in case studies and discussion using current and past news of earthquake events.	2	
4	Lecture	Students will engage in formal lectures to gain knowledge in terms of seismicity and seismic monitoring in Hong Kong, preparedness, and mitigation.	6	
5	Lecture	Students will engage in formal lectures to obtain knowledge about primary effects of earthquakes (e.g., buildings, lifelines).	3	
6	Lecture	Students will engage in formal lectures to gain knowledge regarding secondary effects of earthquakes (e.g., landslide, tsunami, fire, economic loss).	4	

7	Group Project/Group Presentation	Students will participate in groups to pursue a topic of their own interest and background after the consultation with the instructor; submit a group report explaining the issue focused and discussing their findings in the context of course; and engage in critical discussion on assessed group presentations in order to increase their knowledge and skills.	1, 2, 3, 4, 5, 6	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Two Assignments	1, 2, 3, 4	10	
2	Group project report	1, 2, 3, 4, 5, 6	40	
3	Group project presentation	1, 2, 3, 4, 5, 6	20	

Continuous Assessment (%)

70

Examination (%)

30

Examination Duration (Hours)

1

Additional Information for ATs

To pass a course, a student must obtain minimum marks of 30% in both coursework and examination components, and an overall mark of at least 40%.

Assessment Rubrics (AR)

Assessment Task

Two Assignments

Criterion

Capacity to discuss earthquake process and implications

Excellent (A+, A, A-)

Excellent grasp of the earthquake process and implications

Good (B+, B, B-)

Some grasp of the earthquake process and implications

Fair (C+, C, C-)

Fair grasp of the earthquake process and implications

Marginal (D)

Little grasp of the earthquake process and implications

Failure (F)
Not even reaching marginal level

Assessment Task
Group project report

Criterion
Capacity to explain the issue focused and discuss their findings

Excellent (A+, A, A-)
Clear description of problem focused in relation to course context

Good (B+, B, B-)
Some description of problem focused in relation to course context

Fair (C+, C, C-)
Insufficient description of problem focused in relation to course context

Marginal (D)
Little or no description of problem focused in relation to course context

Failure (F)
Not even reaching marginal level

Assessment Task
Group project presentation

Criterion
Capacity to explain the issue focused and discuss their findings

Excellent (A+, A, A-)
Clear description of problem focused in relation to course context

Good (B+, B, B-)
Some description of problem focused in relation to course context

Fair (C+, C, C-)
Insufficient description of problem focused in relation to course context

Marginal (D)
Little or no description of problem focused in relation to course context

Failure (F)
Not even reaching marginal level

Assessment Task
Examination

Criterion
Capacity to discuss earthquake process and implications

Excellent (A+, A, A-)
Excellent grasp of the earthquake process and implications

Good (B+, B, B-)
Some grasp of the earthquake process and implications

Fair (C+, C, C-)
Fair grasp of the earthquake process and implications

Marginal (D)
Little grasp of the earthquake process and implications

Failure (F)
Not even reaching marginal level

Part III Other Information

Keyword Syllabus
Earthquake hazards, ring of fire, wave propagation, earthquake magnitude and intensity, tsunami, earthquake loss, seismic monitoring

Reading List

Compulsory Readings

	Title
1	Lecture notes

Additional Readings

	Title
1	United States Geological Survey (2001), This Dynamic Earth.
2	Bolt BA (2004). Earthquakes. W. H. Freeman, New York.
3	Kramer SL (1996). Geotechnical Earthquake Engineering. Prentice-Hall.
4	Reiter L. (1990). Earthquake Hazard Analysis. Columbia University Press.
5	This Dynamic Earth', online version, USGS http://pubs.usgs.gov/gip/dynamic/
6	Earthquake Hazards Program, United States Geological Survey (USGS) http://earthquake.usgs.gov/
7	China Seismological Bureau (中國地震信息網) http://www.csi.ac.cn
8	HK Observatory [earthquakes in HK] http://www.weather.gov.hk/gts/equake/seismic_mon_e.htm?defaultpopup=0
9	Consortium of Organizations for Strong-Motion Observation Systems (COSMOS) http://db.cosmos-eq.org/scripts/default.plx

Annex (for GE courses only)

A. Please specify the Gateway Education Programme Intended Learning Outcomes (PILOs) that the course is aligned to and relate them to the CILOs stated in Part II, Section 2 of this form:

Please indicate which CILO(s) is/are related to this PILO, if any (can be more than one CILOs in each PILO)

PILO 2: Explain the basic methodologies and techniques of inquiry of the arts and humanities, social sciences, business, and science and technology

1, 3, 4, 5

PILO 3: Demonstrate critical thinking skills

6

PILO 4: Interpret information and numerical data

1

PILO 5: Produce structured, well-organised and fluent text

6

PILO 6: Demonstrate effective oral communication skills

6

PILO 7: Demonstrate an ability to work effectively in a team

6

PILO 10: Demonstrate the attitude and/or ability to accomplish discovery and/or innovation

6

B. Please select an assessment task for collecting evidence of student achievement for quality assurance purposes. Please retain at least one sample of student achievement across a period of three years.

Selected Assessment Task

Student project