Subject Description Form

Subject Code	LSGI1D03M
Subject Title	Living on a Dynamic Earth
Credit Value	3
Level	1
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	To enable students to understand the dynamics of their home planet and their roles in their daily lives. To contribute to the expansion of students intellectual capacity and interdisciplinary learning encompassing, astronomy, geology, geophysics, geodesy, geography, geomorphology, and ocean and atmospheric sciences.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) Understand the dynamics of the Earth at the local, regional and global scale b) Establish the scientific fundaments for students to realize the impact of human activities on the environment for social responsibility c) Appreciate the role and the complexity of modern science. The subject content exposes students to a wide variety of scientific problems, which took centuries for the best scientific minds to discover, observe, formulate, and, solve. Students' exposure to a number of changes on a dynamic earth empowers them to understand a broad range of scales under which the nature operates. Overall, subject content and the addressed problems in earth sciences broaden students' thinking and appreciation of the value of science that unravels the hidden side of the dynamic earth. The students are required to complete a literature review report and examine the recent research progress in an area, which is selected by students, by comparing with the old research work. The students are able to think independently and critically what research area is of interest to them and what research progresses have been made in that selected area. This process trains the students' multiple levels of skills in literature search and reviewing, independent thinking, and making comparative studies.

<table>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td>A. Earth and Space
Earth’s orbit, earth’s shape and size, day and night time zones, the seasons, latitude and longitude, the solar system, structure of the sun, the sun’s energy, the moon, solar and lunar eclipses, structure of earth, earth’s magnetic field, earth’s magnetosphere, meteors, meteorites, elements: universal abundance.

B. Earth's History
Superposition, unconformities, complex rock sequences, Paleomagnetic dating, how fossils form, fossil use in rock correlation, correlating rocks, tree of life, evolutionary clocks, mass extinctions, geologic times.

C. Earth's Rocks
Origins, elements, internal heat, periodic table, atoms, compounds, isotopes and ions, crystals and minerals, crystal systems, rock forming minerals, hardness, igneous rocks, intrusive igneous rocks, magma production, volcanoes, geysers and hot springs, sedimentary rocks, metamorphism, continental drift and plate tectonics, isostasy, ore, coal, oil, and gas.

D. Air and Oceans
Atmosphere, radio waves, the nitrogen cycle, the carbon and oxygen cycles, heat transfer processes, sunshine, temperature belts, pressure belts, the Coriolis effect, wind circulation, humidity, fog cloud types rain, snow, and sleet rain types, thunderstorm, cyclones, hurricanes, tornadoes, pressure systems air masses, water oceans, ocean temperatures, the ocean floor, seafloor profiling, tides ocean currents, waves and beaches, coastlines, coral reefs, atolls and guyots.

E. Shaping the Surface
Continents, lakes, islands, mountains, deserts, and rivers.
Overview of Hong Kong’s geological landscape</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>In class lectures together with online demonstrations, videos, and internet resources are employed for teaching and learning. Lectures are reinforced by relevant animations and videos shown during the tutorials. Students are required to write a brief report based on a required textbook.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>Two online multiple-choice tests. A book report of 1,500 - 2,500 words on a required reading text.
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="3">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>Book report (1,500 - 2,500 words)</td><td>50%</td><td>✓</td><td>✓</td><td>✓</td></tr>
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	Two online MCQs	25% + 25%	✓	✓	✓
	Total	100%			

Student Study Effort Expected	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Tutorial	13 Hrs.
	Other student study effort:	
	▪ Self-study	35 Hrs.
	▪ Assignment of reading/writing	33 Hrs.
	Total student study effort	107 Hrs.

Reading List and References

Textbook

- Earth Science: An illustrated guide to science. Adams, S., & Lambert, D. (2006). New York, Chelsea House. Available via Mylibrary: http://lib.myilibrary.com/Open.aspx?id=205152

Books and eBooks

- Earth: Evolution of a Habitable World, Lunine, J.I., pp.346, Cambridge University Press, 2013. It is accessible through the PolyU library as an eBook.
- Princeton Primers in Climate: Climate and the Oceans, Vallis, G.K., pp. 244, Princeton University Press, 2011. It is accessible through the PolyU library as an eBook. A Kindle version is also available.
- Earth Science and Human History 101, by: Rogers, John J.W.;Tucker, Trileigh L., Greenwood Publisher, 2008. It is accessible through the PolyU library as an eBook.
- Earth Science Demystified, McGraw-Hill Professional Pub.,1 Ed. (2004), ISBN-10: 0071434992, ISBN-13: 978-0071434997. PolyU Library reserve: QE26.2 .T38 2012.
- Earth Science, E.J. Tarbuck, F.K. Lutgens, Prentice Hall Pub., 13 Ed. (2011). Also available as an eBook.

Tutorial videos

- Planet Earth: Limited Edition. Produced by the BBC (2011), Narrated by David Attenborough (Actor), Alastair Fothergill (Director).DVD, 8h 21 mn.
- Earth: the biography / produced by the BBC for National Geographic Channel. Description: 2 videodiscs (228 min.): sd., col.; 4 3/4 in. Call No.: QE501 .E277 DVD. URL: http://library.polyu.edu.hk/record=b2527723~6
- How the Earth changed history. BBC Productions; a BBC/National Geographic Channel-US co-production in association with ZDF. 2 videodiscs (310 min.): sd., col.; 4 3/4 in. Call No. GF51 .H69 DVD URL: http://library.polyu.edu.hk/record=b2527731~6

	There are also a number of online videos accessible through the subject's class material.