科目ナンバリング	U-LAS15 10002 LE58						
授業科目名<英訳>	Introduction to Earth Science A Introduction to Earth Science A			担当者所属職名・氏名	工学研究科　准教授　ZHU Fan		
群	自然科学科目群		分野(分類)	地球科学(基礎)		使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2026・前期	曜時限	金1	配当学年	主として1回生	対象学生	理系向

[授業の概要・目的]

Year after year, the effects of climate change (extreme heat waves, rising sea-levels, changes in patterns of precipitation, floods, droughts, intense hurricanes, etc.) are increasingly affecting--directly and indirectly--the physical, social, and psychological health of humans.

As a student of engineering discipline, you will be responsible--at some point of your future professional career, be it in the public or private sector--to device strategies, methods, and/or techniques to mitigate its effects, either globally or locally. But, in order to do so, you first need to understand how our planet works, how its diverse parts are interrelated, and how changes in the working of some of its elements could disrupt complete systems.

This lecture introduces the concept of system - the interactions among Earth's components, the principles of Earth's energy balance, with a focus on the three main subsystems - atmosphere, hydrosphere, and geosphere - and their interactions across different timescales. The cause and consequence of climate change will also be reviewed.

[到達目標]

The course provides an understanding of the interactions among Earth's components, the fundamentals of Earth's energy balance, and the principles governing the behavior of the atmosphere, hydrosphere, and geosphere. With this knowledge, students will be able to explain important phenomena occurring on Earth.

[授業計画と内容]

This course consists of 15 classes including one feedback class. The classes will be grouped into several topics. Each topic will be taught in two or three lectures as listed below:

1. Introduction to Earth Systems (2 sessions)
Coupling and feedback loops in the Earth system.

2. Global Energy Balance (3 sessions)
The greenhouse effect, umbrella effect, and climate change.

3. Atmosphere (3 sessions)
Circulation of the atmosphere and precipitation.

4. Hydrosphere (3 sessions)
Seawater properties, surface currents and deep ocean currents.

5. Geosphere (3 sessions)
Anatomy of Earth and plate tectonics.

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6. Feedback (1 session)

[履修要件]

特になし

[成績評価の方法・観点]

Evaluation will be based on in-class exercise and homework (50%) and a final exam (50%).

[教科書]

Handouts will be provided for each class.

[参考書等]

（参考書）

Lee R. Kump, James F. Kasting, Robert G. Crane 『The Earth System』ISBN:9780321597793
Brian J. Skinner, Barbara Murck 『The Blue Planet : An Introduction to Earth System Science』ISBN: 9780471236436
Frederick K. Lutgens, Edward J. Tarbuck 『The Atmosphere : An Introduction to Meteorology』ISBN: 9780321756312
Edward J. Tarbuck, Frederick K. Lutgens 『Earth : An Introduction to Physical Geology』ISBN: 9780321814067
All additional reference books are available at the Library in Yoshida Campus, and also at other Kyoto University libraries. Previous editions of the same books can also be used.

[授業外学修（予習・復習）等]

Handouts will be provided at the beginning of each session. You are expected to use them to follow the lectures, to take notes, and as a starting point to further your personal self-learning.

[その他（オフィスアワー等）]

Information will be provided during the first lecture.

[主要授業科目（学部・学科名）]

理学部