

科目ナンバリング		U-LAS70 10002 SE50					
授業科目名 <英訳>	ILAS Seminar-E2 :Fundamentals of Earth's atmosphere dynamics and climate (地球大気の力学と気候の基礎) ILAS Seminar-E2 :Fundamentals of Earth's atmosphere dynamics and climate			担当者所属 職名・氏名	生存圏研究所 教授 Luce , Hubert		
群	少人数群	単位数	2単位	週コマ数	1コマ	授業形態	ゼミナール (対面授業科目)
開講年度・ 開講期	2024・前期	受講定員 (1回生定員)	5 (5) 人	配当学年	主として1回生	対象学生	全学向
曜時限	金5	教室	共西23			使用言語	英語
キーワード	Atmosphere / weather / climate						
【授業の概要・目的】							
This seminar proposes an introduction to atmosphere physics with the purpose to be understandable by everyone. Based on fundamental concepts and principles, it is made for all the students who wish to understand the structure of the atmosphere and its dynamics, including the current climates, weather and cloud systems and extreme events, without complex theoretical modellings. They will also have the tools necessary to better understand certain aspects of the climate change, one of the objectives of the Sustainable Development Goals (SDG13: climate action) of the United Nations.							
【到達目標】							
In this seminar, the students will get insights into the main mechanisms responsible for the state and dynamics of the atmosphere, cloud life cycle, weather systems and extreme events (such as tropical cyclones and tornadoes). Students will also acquire the physical backgrounds for understanding how human activities can affect these processes.							
【授業計画と内容】							
1. (Weeks 1-2) Composition and vertical structure of the atmosphere: - Composition of the air and its origins. - Temperature, density and pressure: the hydrostatic equilibrium.							
2. (Weeks 3-5) Terrestrial and solar radiations: energetic balances. - The radiative balance of the Earth - Greenhouse effect: a simplified model - A complication: effects of convection - How do our activities affect these balances?							
3. (Weeks 6-8) Contribution of water: - The water in all its phases - Principle of saturation, latent heat. - Cloud formation and precipitation -Thermal gradient of the troposphere and stability.							
4.(Weeks 9-11) _ _ _ _ _							
				ILAS Seminar-E2 :Fundamentals of Earth's atmosphere dynamics and climate (地球大気の力学と気候の基礎) (2)へ続く			

Atmospheric circulations and weather systems:

- The main features and prevailing winds
- The monsoons
- The mid-latitude circulations
- Some extreme weather systems.

5. (Weeks 12-13)

Ocean-atmosphere coupling:

- The role of the ocean in the climate system.
- Example 1: El Nino-southern oscillation (ENSO)
- Example 2: North Atlantic Oscillation (NAO)

6. (Week 14)

Cryosphere-atmosphere coupling:

- The role of the ice in the climate system.
- The impact of melting ice on the climate.

7. (Week 15)

Final Examination.

8. (Week 16)

Feedback.

【履修要件】

This lecture only requires scientific backgrounds in natural sciences of high school levels.

【成績評価の方法・観点】

Evaluation will be:

Active participation in class: 30 pts

Assignments/projects at home: 30 pts

Final examination: 40 pts

【教科書】

There is no specific textbook for this course. Its content will be based on multiple references (books, websites) that will be mentioned during the course.

【参考書等】

(参考書)

授業中に紹介する

【授業外学修 (予習・復習) 等】

Materials (pdf files) are made available before class.

Students are encouraged to study materials before and after each class for assimilating technical or uncommon words.

Depending on the topic, the study of the materials and the preparation of the report for the evaluation may take a few hours a week.

【その他（ オフィスアワー等 ）】

Materials (pdf files) are available on Kulasis website. Communication by emails are possible for questions outside of class hours.