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| 科目ナンバリング | | U-LAS61 10021 LE14 | | | | | | | |
| 授業科目名 <英訳> | Climate Change and Human Activities-E2 : Introduction to Humanosphere Climate Change and Human Activities-E2 :Introduction to Humanosphere | | | | 担当者所属 職名・氏名 | 生存圏研究所 教授 Luce , Hubert | | | |
| 群 | 統合科学科目群 | | | 分野(分類) | 環境 | | 使用言語 | 英語 | |
| 旧群 | | 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4 | | 配当学年 | 主として1・2回生 | 対象学生 | 全学向 |
| [授業の概要・目的] | | | | | | | | | |
| <p>Understanding past climates and the mechanisms behind their variations is fundamental to understand the causes and consequences of present-day climate change. This course provides students with the scientific foundation and historical perspective necessary to analyze climate change mechanisms and evaluate their environmental and societal impacts. The course explores: (1) Major climate changes throughout Earth ' s history and the natural mechanisms that produced them. (2) The current climate change and how its human-driven causes differ from past natural events. (3) Historical examples of how climate variability has affected human societies during the Holocene and recent centuries. (4) Possible future impacts of modern climate change on the environment and human society (the humanosphere). Aligned with the United Nations Sustainable Development Goal 13 (Climate Action), this course equips students with the analytical tools to assess the implications of ongoing climate change and to discuss strategies for adaptation and mitigation.</p> | | | | | | | | | |
| [到達目標] | | | | | | | | | |
| <p>By the end of the course, students will be able to:</p> <ul style="list-style-type: none"> - Describe the evolution of Earth's climate from geological to modern times. - Identify the natural and anthropogenic drivers of climate change. - Understand the role of feedback mechanisms and tipping points in the climate system. - Analyze historical examples of climate-related societal transformations. - Evaluate the potential societal and environmental impacts of current and future climate change. - Relate historical lessons to modern climate challenges and policy responses. | | | | | | | | | |
| [授業計画と内容] | | | | | | | | | |
| <p>Weeks 1-2: Introduction and Present-Day Climate</p> <ul style="list-style-type: none"> - Overview of current global climate conditions - The importance of studying past climates - Objectives and methods of paleoclimatology - How historical climate knowledge improves climate predictions <p>Weeks 3-5: Causes of Climate Change</p> <ul style="list-style-type: none"> - Natural Causes: (Solar variability, Milankovitch cycles, Volcanic activity, Continental drift and plate tectonics, Albedo changes, Greenhouse gas fluctuations, Internal climate variability) - Anthropogenic Causes: (Greenhouse gas emissions, Deforestation and land-use change) <p>Week 6: Climate Feedbacks and Tipping Points</p> <ul style="list-style-type: none"> - Positive and negative feedback mechanisms - The concept of climate thresholds and irreversible changes - Examples: Ice-albedo feedback, permafrost thaw, ocean circulation changes | | | | | | | | | |
| Climate Change and Human Activities-E2 :Introduction to Humanosphere(2)へ続< | | | | | | | | | |

Weeks 7-8: Reconstructing Past Climates

- Methods of climate reconstruction (ice cores, sediment records, tree rings, isotopic analysis)
- Evolution of Earth's atmosphere
- Overview of major ice ages and their natural drivers

Weeks 9-10: The Holocene Epoch

- Post-glacial climate evolution
- Early human-environment interactions
- Climate variability and its influence on the rise and fall of early civilizations

Weeks 11-12: Societal Impacts of Climate Disruptions Since Medieval Times

- Case studies: Medieval Optimum, Little Ice Age, and climate impacts in Europe and Japan
- Effects on agriculture, trade, population, and social stability

Weeks 13-14: Lessons from the Past and Future Outlook

- Comparing past and present climate disruptions
- Assessing societal vulnerability and resilience
- Strategies for mitigation and adaptation to modern climate change

Week 15: Final Examination

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: 20 pts

Assignments/projects at home: 40 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】

Course materials are made available before class.

Students are encouraged to study the materials before and after each class in order to assimilate technical or uncommon words.

Depending on the topic, the study of the lecture and the preparation of the report for the assessment may take several hours per week.

Climate Change and Human Activities-E2 :Introduction to Humansphere(3)

【その他（オフィスアワー等）】

Lecture materials will be made available on the KULASIS website. Communication by e-mail is possible for questions outside school hours.

【主要授業科目（学部・学科名）】