**Nazwa przedmiotu:**

Climate changes (WN1A\_11/06)

**Koordynator przedmiotu:**

prof. dr hab. inż. Małgorzata Kacprzak

**Status przedmiotu:**

Fakultatywny dowolnego wyboru

**Poziom kształcenia:**

Studia I stopnia

**Program:**

Inżynieria Środowiska

**Grupa przedmiotów:**

Wspólne dla wydziału

**Kod przedmiotu:**

WN1A\_11/06

**Semestr nominalny:**

4 / rok ak. 2022/2023

**Liczba punktów ECTS:**

1

**Liczba godzin pracy studenta związanych z osiągnięciem efektów uczenia się:**

Lecture: number of taught hours according to study plan – 10 h; student individual work: reading key literature – 10 h; preparation to test – 5 h; In total 25 h = 1 ECTS

**Liczba punktów ECTS na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich:**

Lecture – 10 h; In total 10 h = 0,4 ECTS

**Język prowadzenia zajęć:**

angielski

**Liczba punktów ECTS, którą student uzyskuje w ramach zajęć o charakterze praktycznym:**

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**Formy zajęć i ich wymiar w semestrze:**

|  |  |
| --- | --- |
| Wykład: | 15h |
| Ćwiczenia: | 0h |
| Laboratorium: | 0h |
| Projekt: | 0h |
| Lekcje komputerowe: | 0h |

**Wymagania wstępne:**

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**Limit liczby studentów:**

Lecture: min. 15

**Cel przedmiotu:**

Climate change is one of the most important civilization problem. The goal of the course is to provide for undergraduate students knowledge on anthropogenic and climatic causes as well as global and regional effects of changes in the concentration of carbon dioxide and other greenhouse gases (GHGs) in the atmosphere. The phenomena of climate variability and changes, both observed in the past and predicted for the next century, that affect the human population and natural ecosystems, will be discussed. The components and basic mechanisms governing the response of the climate system to the factors driving changes will be characterized. The role of science, politics, social, economic and media issues in the current debate on what to do with climate change will also be demonstrated.

**Treści kształcenia:**

1. Climate changes - historical outline and scenarios of future changes. 2. The water and carbon cycle - physical and biogeochemical processes, carbon footprint, water footprint. 3. Extreme phenomena - floods, droughts and cyclones. 4. The impact of climate change on people and climate (water resources, food security, energy. 5. Global Warming and the Greenhouse Effect – global and regional impact. 6. Models and climate forecasts. 7. COP 25 simulation. 8. Adaptation of urbanized areas - the role of blue and green infrastructure; mitigating the local climate and improving air quality, managing rainwater; limiting the occurrence of urban floods and their effects. 9. Climate and society - social costs of climate change.

**Metody oceny:**

The attendance at lectures is recommended. It is recommended that the student attends all lectures (10 hours). Each lecture will end with a short quiz on the content of the lecture. If the student participates in all the quizzes (confirmation of the activity in lectures), it will be a bonus to raise the test grade by half a grade. The condition for passing the lectures is obtaining a positive grade from the written test in the fifteenth week of classes, containing the lectures content. The obtained assessment from the written lecture test is made available at the next consultation. In the case of a unsatisfactory grade from the lecture test, the student has the possibility to correct it during the next term in the examination session. In the case of failure to pass a given material, students are allowed to take an final date in the resit session. The student may repeat the lecture due to unsatisfactory results only in the next academic year. When completing the course, the student may only use his or her acquired knowledge. It is unacceptable to use your own notes, books and scripts. The student has the right to inspect his work always during the tutor's consultation hours or at another time agreed by email.

**Egzamin:**

nie

**Literatura:**

1. UNFCCC, United Nations Framework Convention on Climate Change. 2007 Climate change - impacts, vulnerabilities and adaptation in developing countries, https://unfccc.int/resource/d ocs/publications/impacts.pdf
2. Schmittner A. 2018, Introduction to Climate Science, https://ope n.oregonstate.education/climatechange/ 3. Department of Food and Rural Affairs Accounting for the Effects of Climate Change Supplementary Green Book Guidance, November 2020,
3. https://assets.publishing.service.gov.uk/government/uploads /system/uploads/attachment\_data/file/934339/Acc ounting\_for\_the\_Effects\_Of\_Climate\_Change\_-\_Sup plementary\_Green\_Book\_..\_.pdf
4. Ramakrishnan V, McNutt M. 2020. Climate Change Evidence &Causes, update 2020. An overview from the Royal Society and the US National Academy of Sciences, https://royalsociety.org/-/media/Royal\_Society\_Co ntent/policy/projects/climate-evidencecauses/climate-change-evidence-causes.pdf

**Witryna www przedmiotu:**

-

**Uwagi:**

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## Charakterystyki przedmiotowe

### Profil ogólnoakademicki - wiedza

**Charakterystyka W03\_03:**

Has basic knowledge of meteorology and climatology in the context of causes and effects of climate change.

Weryfikacja:

Test from lectures content

**Powiązane charakterystyki kierunkowe:** I1A\_W03\_03

**Powiązane charakterystyki obszarowe:** P6U\_W

### Profil ogólnoakademicki - umiejętności

**Charakterystyka U01\_01:**

Is able to obtain information from the English literature on climate change.

Weryfikacja:

Test from lectures content

**Powiązane charakterystyki kierunkowe:** I1A\_U01\_01

**Powiązane charakterystyki obszarowe:** P6U\_U

### Profil ogólnoakademicki - kompetencje społeczne

**Charakterystyka K07\_02:**

Understands the need to make the society aware of the negative impact of human activity on the natural environment (especially in the field of climate change) and the need to use it responsibly in accordance with the principle of sustainable development.

Weryfikacja:

Active participation in lectures (quizzes)

**Powiązane charakterystyki kierunkowe:** I1A\_K07\_02

**Powiązane charakterystyki obszarowe:** I.P6S\_KO