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| Course number | G-LAS15 80018 LB95 | | | | |
| Course title (and course title in English) | 宇宙居住学 Space Habitalogy | | Instructor's name, job title, and department of affiliation | Graduate School of Advanced Integrated Studies in Human Survivability Professor, YAMASHIKI YOSUKE | |
| Group | Interdisciplinary Graduate Courses | | Field(Classification) | Interdisciplinary Courses | |
| Language of instruction | Japanese and English | | Old group | | Number of credits 2 |
| Number of weekly time blocks | 1 | Class style | Lecture (Face-to-face course) | | Year/semesters 2025・Second semester |
| Days and periods | Thu.1 | Target year | Graduate students | | Eligible students For all majors |

(Students of Graduate School of Advanced Integrated Studies in Human Survivability cannot take this course as liberal arts and general education course. Please register the course with your department.)

[Overview and purpose of the course]

21世紀後半に人類が月・火星への移住を現実のものとするという未来を想定し、それに必要な 基幹技術と社会システム上の問題点を統合し、宇宙時代の基幹学問体型として確立することを 目標とする。地球にあり宇宙への移転を見据えた生態系システムを「コアバイオーム複合体」とし、「生命維持」システムの維持に必要な技術体系を「コアテクノロジー」と名づけ、また、これらを備えた「循環型」の社会を「コアソサエティ」と名づけ、「宇宙社会」の実現を精査・検討する。本宇宙居住学においては、月・火星での千人の社会の構築を目標とし、その上に「生命維持装置」を基盤とする「循環型社会」を構築するための技術を学ぶ。また、人間が長期間健康的な生活を営むための「人工重力設備」などの基幹技術を駆使し、循環型都市「コアシティ」を提案し、これらを地球における都市の概念に還元し、地球・宇宙での循環型社会の構築に向けた、基礎的学力を身につける。

Assuming a future in which human migration to the Moon and Mars becomes a reality in the latter half of the 21st century, our goal is to integrate the core technologies and social system issues necessary for this migration and to establish them as the "core" disciplines of the space age. The ecological system that exists on the earth and is designed to be transferred to space is entitled as "core biome complex," the technological system necessary to maintain the "life support" system is called "core technology," and the circular society equipped with these technologies is called "core-society," and the realization of "space society" is examined and investigated based on these concepts. In this space habitation study, the goal is to build a society of 1,000 people on the Moon and Mars, and to learn technologies to build a circular society based on "life-support systems" on top of that. In addition, we will propose a circular city, "Core City," by making full use of key technologies such as "artificial gravity facilities" to enable humans to lead healthy lives for a long period of time, and reduce these technologies to the concept of cities on Earth.

[Course objectives]

宇宙開発が現実になる時代において、惑星空間での居住の可能性と課題について理解し、宇宙に社会を構築するためにどのような技術が必要で、またどのような問題点が存在するかについて、現在構想中の宇宙建築を軸とした理解を深めることができる。

In an era when space exploration is becoming a reality, students will be able to understand the possibilities and challenges of living in planetary space, and deepen their understanding of what technologies are needed to build a society in space and what problems exist, based on the space architecture that is currently being conceived.

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宇宙居住学(2)

[Course schedule and contents]

第一回

ハビタブルな惑星環境とは

What is the Habitable Planetary Environment

第二回

地球生態系の代表としてのコアバイオーム複合体について

Core-Biome Complex as a representative of Terrestrial Ecosystem

第三回

宇宙移住に欠かせないコアテクノロジーについて

Core-technologies as essential technology for planetary migration

第四回

宇宙森林

Space Forestry

第五回

宇宙海洋

Space Oceanography

第六回

宇宙居住の課題 低重力と遠心力の利用

Challenges of Space Habitation: Utilization of Low Gravity and Centrifugal Force

第七回

月面における人工重力施設と施設間交通

Artificial gravity facilities and inter-facility transportation on the Moon

第八回

火星における人工重力施設と火星都市

Artificial Gravity Facilities on Mars and Martian Cities

第九回

超重力惑星において重力を減じる方法

How to reduce gravity on a super gravity planet

第十回

人類の恒久的な宇宙進出にむけた建築的解法

Architectural Solutions for Permanent Human Space Exploration

第十一回

月社会の構築に向けて

How to establish lunar society as “ Moon Village ”

第十二回

宇宙観光について

Space Tourism

第十三回 第十五回

宇宙空間での循環経済社会構築に向けて

Toward establishment of Circular Economy and Society in Space

[Course requirements]

None

[Evaluation methods and policy]

講義に出席し、提示された課題に対して、積極的に調べ、自らの想像力で課題提出を行う。

Evaluation based on lecture attendance, and on performance in actively research the issues presented, and use

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宇宙居住学(3)

your own imagination in submitting assignments.

[Textbooks]

山敷庸亮編 『有人宇宙学』（京都大学学術出版会）ISBN:978-4-8140-0494-2

[References, etc.]

（References, etc.）

Introduced during class

[Study outside of class (preparation and review)]

NASA, JAXA, SIC有人宇宙学研究センターのページなどから、宇宙居住に必要な情報について収集を行うこと。 Gather information necessary for space habitation from NASA, JAXA, SIC Human Spaceology Center page,

[Other information (office hours, etc.)]