科目ナンバリング	U-LAS60 10002 LE17				
授業科目名<英訳>	Interdisciplinary Sciences-E2 :Foods and Microbes Interdisciplinary Sciences-E2 :Foods and Microbes	担当者所属職名・氏名	国際高等教育院 特定教授 小柳　義夫 医生物学研究所 准教授 VANDENBON, Alexis 農学研究科　准教授 Hart Nadav FEUER		
群	統合科学科目群	分野(分類)	統合科学	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・後期	曜時限	月5	配当学年	全回生	対象学生	全学向

[授業の概要・目的]

This course takes an interdisciplinary systems approach to broaden your understanding of the microbiome. One key direction of study is the interaction between food and gut microbiome, in particular how enzymes, bacteria and yeasts break-down, interact, and respond to the food we eat. How foods are processed in preparation for consumption, including fermentation, sterilization, and modification are also key factors in food safety, public health, and culinary culture. To achieve a holistic view of the complex role of microbes in human food systems, the course unfolds in three multidisciplinary modules focusing on biology, culture and food science, and informatics. Each module includes preparatory coursework, case studies, and group activities aiming to foster knowledge exchange and communication between participants. The teaching team consists of staff from three faculties and is aimed at wide audience of local and international students. This course aims to equip participants with lateral, integrative and forward thinking skills that cultivate interest in contributing to and leading future changes in complex food science from the biological scale to the global scale.

Course content includes multilateral reports, media, and academic literature illuminating the food microbiome from three perspectives:

Working Group I: The foundations of modern biology including using artificial intelligence (AI) technology,

Working Group II: Food science and culture, and

Working Group III: Statistics.

This course encourages students to develop self-learning skills and English expression skills, through assigned self-directed group discussions and presentations.

[到達目標]

The expectations and goals for students taking this course are:

1. Be able to define and explain the biological importance of foods from various countries, especially complex microorganisms, and food system issues from multiple perspectives.
2. Learn food, biology, economics, and related critical thinking skills.
3. Develop effective communication skills and be able to participate in discussions on class topics.

[授業計画と内容]

1. Introduction (1 week)
- Outline of the course and explanation of objectives
- Introduction to basic concepts and content expectations
- Self-introduction of participants
- Group composition: Considering the balance of nationality, background, and gender, we plan to work in eight groups (planned) throughout the semester.
- For each theme, multiple groups will be assigned to specific working group report sections, allowing for cross-group discussion.

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2.- 5. Theme 1 (4 weeks) “ Human system and microbes ”
- Week 1: Skills and concepts training by Koyanagi and assignment of sub-topics
- Week 2: Group work (research, analysis, collaboration with other groups, presentation preparation)
- Weeks 3 and 4: Group presentations and discussions (3 groups/sessions x 25 minutes)
Feedback will be provided at the end of the presentation session (15 minutes).
Homework: Personal report.

6.- 9. Theme 2 (4 weeks) “ Contemporary scientific perspectives on traditional diets ”
- Week 1: Skills and concept training Feuer and assignment of sub-topics
- Week 2: Group work (research, analysis, collaboration with other groups, presentation preparation)
- Weeks 3 and 4: Group presentations and discussions (3 groups/sessions x 25 minutes)
Feedback will be provided at the end of the presentation session (15 minutes)
Homework: Edutainment social media post

10.- 13. Theme 3 (4 weeks) “ Data analysis methods for microbes and human genome ”
- Week 1: Skills and concepts training by Vandenbon and assignment of sub-topics
- Week 2: Group work (research, analysis, collaboration with other groups, presentation preparation)
- Weeks 3 and 4: Group presentations and discussions (3 groups/sessions x 25 minutes)
Feedback will be provided at the end of the presentation session (15 minutes)
Homework: Data visualization

14. Closing session (1 week)
- General discussion: remarks and comments by all
- Final remarks

15. Feedback

[履修要件]

特になし

[成績評価の方法・観点]

Assessment for the class will base on the following three criteria:
1. Class attendance/active participation in group work.
2. Group presentations and personal report.
3. Individual homeworks (interim and final).
Details on each criterion will be announced during the first class.

[教科書]

使用しない

[参考書等]

（参考書）

Microbial Biotechnology. 2023 Jul;16(7):1412-1422. doi: 10.1111/1751-7915.14263

Microbial Biotechnology 2024 Feb;17(2):e14428. doi: 10.1111/1751-7915.14428.

FAO and original manuscripts

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（関連ＵＲＬ）

https://openknowledge.fao.org/items/5622146b-4e2b-413e-b092-aa8551a619fb(Microbiome: The missing link? Science and innovation for health, climate and sustainable food systems)
https://www.microbiomesupport.eu/(Within the European-funded Coordination and Support Action Microbiome Suppor, the Workshop ‘ Education in Food Systems Microbiome Related Sciencest)

[授業外学修（予習・復習）等]

We expect students to read the recommended resources for each session, in order to be able to actively participate in discussion. In order to prepare for each presentation, students will need to meet with their group in between sessions, outside the class time.

[その他（オフィスアワー等）]

- The expected number of students is 45 to 54 (= 5 to 6 x 9 groups). Priority will be given to iUP Japanese and international students enrolled in the program, and other students will be registered in the available slots.
- Regarding office hours, use LMS to send an e-mail to request an appointment.

[主要授業科目（学部・学科名）]

理学部