科目ナンバリング	U-LAS11 20005 SE55						
授業科目名 <英訳>	Data Analysis Practice I-E2 Data Analysis Practice I-E2			担当者所属 職名・氏名	薬学研究科　准教授　Martin Robert		
群	自然科学科目群			分野(分類)	データ科学(発展)	使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	演習（対面授業科目）
開講年度・開講期	2026・前期	曜時限	水4	配当学年	全回生	対象学生	全学向

[授業の概要・目的]

The world around us, is filled with numbers (data) that range over many scales of space and time and that describe its organization. In biology, traditionally, data feature parts lists and partial views of the connections between those parts. However, there is also a vast amount of quantitative (numerical data) that is accumulating, whether from sequences of DNA, concentrations of various biomolecules, or other types of data.

The ability to handle, process, explore, and visualize data are important skills for all students. While in this course many examples will be derived from biology, the mindset and basic analysis workflows are widely applicable in any domain of science, engineering and beyond.

In this course you will learn how to use R, RStudio, and the Tidyverse packages to clean, process, manipulate, explore, and visualize data.

[到達目標]

By the end to this course participants should be able to:
- Perform basic data processing and analysis using R
- Find and describe different forms of (biological) data
- Elaborate specific questions about the data
- Clean and process raw data
- Transform data
- Draw various types of plots to interpret from its results
- Gain insight into data
- Develop analysis workflows
- Effectively communicate the results of data analysis

[授業計画と内容]

The following topics will be covered over the course of 14 classes, not necessarily in that order:

Week 1 Guidance and introduction
Week 2 What is data? Getting started with R
Week 3 Workflow demonstration
Week 4-5 Importing and cleaning up data
Week 6-7 Data transformation
Week 8 Data visualization
Week 9 Digging deeper into R using dplyr
Week 10 Dealing with specific data (strings, dates, etc.)
Week 11 Getting to grips with ggplot - producing publication-quality figures
Week 12 Working with single variables
Week 13 Exploring relationships among variables

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Week 14 Looking back and looking forward
Week 16 Feedback

[履修要件]

This course is for beginners in data analysis and R and there is no specific science or math requirement.

Students should bring a computer to class to complete in-class quizzes, exercises, and tutorials as well as homework assignments.

[成績評価の方法・観点]

20 % Class attendance/ participation
60 % In-class exercises and homework assignments
20 % Project and presentation

[教科書]

Owen L. Petchey, Andrew P. Beckerman, Natalie Cooper, and Dylan Z. Childs 『Insights from Data with R : An Introduction for the Life and Environmental Sciences』 （Oxford University Press USA, 2021）
The textbook listed above will be the main resource for the course but students are not required to buy it. Kyoto University Library has some digital license available.

[参考書等]

（参考書）
Wickham and Grolemund 『R for data science』 （O'Reilly Media, 2017）

[授業外学修（予習・復習）等]

Out of class activities will mainly be for assigned readings and homework assignments and for working on a project. Students should expect to spend about 1-2 hours per week preparing for the class and completing assignments.

[その他（オフィスアワー等）]

Announced during class.

[主要授業科目（学部・学科名）]