科目ナンバリング U-LAS14 20050 LE68											
授業科目名 Practical Computing for Biologists-E2 担当者所属 生命科学研究科 准教授 CARLTON Peter											
<英訳>	Practi	cal Com	puting fo	r Biologists-E2	職名	る・氏名	生中科子				TON, Peter
群	自然科学	学科目群		分野 (分類)	生物学((各論)		ſ	吏用言語	英語	语
旧群	B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	2025 • 2	後期	曜時限	火5		配当	学年 主とし	て1・2回生	対象学	生	理系向
[授業の概要・目的]											
This class will introduce students to basic but powerful computational tools that are increasingly becoming an essential part of biological research. We will learn how to navigate a command line environment in a UNIX computer system, explore some useful open source software for DNA and protein analysis, and learn the basics of Python programming for analyzing biological sequence and images.											
Each class will start with a background lecture and proceed to hands-on guidance. The ultimate aim of the class is to provide an introduction that will facilitate your further exploration of computational biology.											
[到達目標]											
-To discover current bioinformatics and biological image analysis software -To be able to design analyze DNA sequences using open online software -To learn general principles of programming using the Python language -To develop a foundation for further exploration of the exciting world of bioinformatics											
[授業計画と内容]											
 Overview of the course. How are computers used in biology? Getting the computer to do stuff: introduction to the "Shell" (terminal) Introduction to manipulating text files and how DNA sequences are stored as text files The EMBOSS molecular biology suite: Searching protein and DNA sequences for features Searching for sequences within the human genome and proteome Detailed work with DNA sequences: introduction to Benchling and DNA cloning (making a new DNA sequence from existing ones) Beginning programming with Python, a general computer language that can be adapted for biology Expanding Python with modules Searching DNA sequences with Python Plotting data with Python Imaging for biologists: Image fundamentals (pixels, intensity, scaling) using Fiji Measuring 2D and 3D objects in images Review of the entire class Feedback (test review and Q&A session) 											
 Peginr Expand Search Plotti Inagi Meas Revie 	from exi ning progra ding Pyth ing DNA ng data w ing for bio uring 2D ew of the	vith DNA sting one ramming on with 1 sequenc vith Pythe ologists: and 3D c entire cla	A sequences) with Pyt modules es with P on Image fu objects in ass	es: introduction hon, a general o bython ndamentals (pi images	n to Ben compute	oroteon Ichling er langu	and DNA age that c	an be ad	dapted for		
 Peginr Expand Search Plotti Inagi Meas Revie 	from exi ning progra ding Pyth ing DNA ng data w ing for bio uring 2D ew of the back (test	vith DNA sting one ramming on with 1 sequenc vith Pythe ologists: and 3D c entire cla	A sequences) with Pyt modules es with P on Image fu objects in ass	es: introduction hon, a general o bython ndamentals (pi images	n to Ben compute	oroteon Ichling er langu	and DNA age that c	an be ad	dapted for		
7. Beginr 8. Expand 9. Search 11. Plotti 12. Imagi 13. Meas 14. Revie 15. Feedt [履修要- A laptop Windows environm	from exi ning progr ding Pyth ing DNA ng data w ing for bid uring 2D ew of the back (test 件] computer s users sho hent; Mac	vith DNA sting one ramming on with r sequence vith Pytho ologists: and 3D of entire cla review a with a w ould insta and UNI	A sequence (s) with Pyt modules es with P on Image fu objects in ass and Q&A vireless in all the pro IX users (es: introduction hon, a general o bython ndamentals (pi images	n to Ben compute xels, into ion is hi i'' (from lt-in term	oroteon chling er langu ensity, ghly re http://v ninal p	and DNA age that c scaling) u commenda www.cygw rogram.	an be ad sing Fij ed for tl vin.com	dapted for i nis class. a) to provi	biol	ogy shell

Practical Computing for Biologists-E2(2)へ続く

Practical Computing for Biologists-E2(2)

Provisions can be made for students who do not have their own laptop.

[成績評価の方法・観点]

Grading will be based on three areas: active participation, quizzes, and a final exam.

"Active participation" will be measured by: class attendance, asking questions/giving comments on PandA (as a rule, each student should ask at least 1 question/give one comment on PandA for each class), and answering questions during in-person classes.

Quizzes: short homework assignments. 3 will be given in total, at week 4, 8, and 12 of the class.

The final exam will be a 3-page exam with short answers, multiple choice questions, and a short English writing assignment.

Each area will contribute 1/3rd of the total grade.

[教科書]

Haddock and Dunn ^PPractical Computing for Biologists (Sinauer Associates) ISBN:978-0-87893-391-4 (Textbook purchase is suggested but optional. See also the companion website at http://practicalcomputing. org)

[授業外学修(予習・復習)等]

Students will have to understand technical vocabulary in English. This may require studying and research outside of class hours.

[その他(オフィスアワー等)]

Office hours will be 1 hour once per week, schedule to be announced on the first day of class.

[主要授業科目 (学部・学科名)]