Diversity and Evolution of Eukaryotes

Course Information

Item	Content
Course title	Diversity and Evolution of Eukaryotes
Semester	Fall semester each year
Designated for	INSTITUTE OF ECOLOGY AND EVOLUTIONARY BIOLOGY, NTU
Instructor	CHUAN KU
Curriculum No.	EEB 5095
Curriculum Id No.	B44 U2070
Credit	2
Full/Half Yr.	Half
Required/Elective	Elective
Time	Friday 5,6(12:20~14:10)
Place	共 302
Remarks	The course is conducted in English。

Course Syllabus

Item	Content
Course Description	This is an introductory course on the diversity of eukaryotes in different aspects — from genomes to ecological interactions. Major topics include evolutionary relationships and history, cell structures and functions, and importance for various ecosystems and humanity. More emphasis is put on eukaryotes less covered in other courses — namely protists (algae and non-photosynthetic microbial eukaryotes) — which occur in oceans, soils, lakes, animal guts and many other environments. In the 2021 Fall Semester, the course is divided into 16 weeks, including two exams (weeks 8 and 16), student presentations (week 14), one national holiday (week 15), and 12 lectures.
Course Objective	To acquire a basic understanding of: 1. Evolutionary origin, history and diversity of eukaryotes and their genomes, organelles, biochemistry, cells, and organismic biology (Part I: Week 3–7) 2. Major eukaryotic lineages and important eukaryotic microbes (Part II: Week 9–12, 14, written assignment and oral presentation) 3. Relationships between eukaryotic microbes and Earth, ecosystems, humans, and other microbes (Part III: Week 13 (and 9–12) + assigned readings)

Course Requirement	General Biology or equivalent courses. Genomics, Cell Biology, Evolutionary Biology, and Ecology are relevant, but not required.
References	1. Archibald et al., Eds., Handbook of the Protists (Springer, ed. 2nd, 2017). 2. Adl et al., Revisions to the classification, nomenclature, and diversity of eukaryotes. J. Eukaryot. Microbiol. 66, 4–119 (2019). 3. Lee, Phycology (Cambridge University Press, Cambridge, ed. 4, 2008). 4. Willey et al., Prescott's Microbiology (McGraw-Hill Education, ed. 10, 2017). 5. Alberts et al., Molecular Biology of the Cell (Garland Science, ed. 6, 2015). 6. Other selected review articles and research papers
Designated Reading	Course slides (midterm and final exam) Additional reading (final exam): Sun et al., Host range and coding potential of eukaryotic giant viruses. Viruses 12, 1337 (2020). Wells et al., Algae as nutritional and functional food sources: revisiting our understanding. J. Appl. Phycol. 29:949–82 (2017).

Progress

Week	Date	Topic
Week 1	Sept. 9, 2022	Adjusted holiday
Week 2	Sept. 16, 2022	Introduction; Tools, techniques and methods
Week 3	Sept. 23, 2022	Origin and early evolution of eukaryotes
Week 4	Sept. 30, 2022	Origin and early evolution of eukaryotes
Week 5	Oct. 7, 2022	Evolution of endosymbiotic organelles
Week 6	Oct. 14, 2022	Cellular structures
Week 7	Oct. 21, 2022	Metabolism, nutrition and cellular interactions; Cell cycle and life cycle
Week 8	Oct. 28, 2022	Midterm exam
Week 9	Nov. 4, 2022	Opisthokonts, Amoebozoans
Week 10	Nov. 11, 2022	Archaeplastids
Week 11	Nov. 18, 2022	SAR
Week 12	Nov.25, 2022	Haptists, Cryptists, Excavates and other eukaryotes
Week 13	Dec.2, 2022	Protists, Earth and humans
Week 14	Dec.9, 2022	Student presentations
Week 15	Dec.16, 2022	Student presentations; Written assignment due
Week 16	Dec.23, 2022	Final exam

Grading

NO	Item	Pc	Explanations for the conditions
1	Written assignment	20%	Short research proposal
2	Oral presentation	15%	
3	Midterm	20%	Materials from weeks 1-7
4	In-class participation	10%	
5	Attendance and punctuality	10%	
6	Final exam	25%	Materials from weeks 9-13 (incl. concepts from weeks 1-7) and two assigned papers

Office Hour

Remarks	Instructor: Chuan Ku chuanku@gate.sinica.edu.tw TA: Ming-Wei Lai mwlai@gate.sinica.edu.tw (02-27871147)