Population Genetics and Evolution

Course outline

Fall 2020

Course No#: DIC 8024
Credits: Three (3 hr per week)
Time: 09:10-12:10, Tuesdays
Place: B204 (2F), Biodiversity Research Center, Academia Sinica (weeks 1~18)

Organizers: Prof. Shou-Hsien Li (7734-6311)

Lecturers:

Dr. John Wang	Dr. Ryuji Machida
Tel: 2787-1582 (A302, BRC)	Tel: 2787-1585 (200,Green House)
johnwang@gate.sinica.edu.tw	ryujimachida@gate.sinica.edu.tw

This is a graduate level course intended for PhD students to learn the fundamentals of population genetics and evolution. The course will be primarily discussion and based on the chapter and paper reading assignments; on most days, there will be no lectures. Students are expected to complete all reading assignments ahead of each class and be prepared for critical discussion. Due to COVID-19, we will make accommodations for remote online classroom discussions for those students not in Taiwan. The quality of class participation is an important part of a student's grade, and the practical reality is that a better internet connection facilitates participation. Thus, concomitantly, remote students must make full effort to obtain a strong internet connection for better discussions.

At the end of the course, we hope that this course will help you develop as an independent scientist. Specifically, students will:

Learn how to critically read and evaluate scientific publications

Identify interesting research questions and propose experimental tests in the form of a grant

Grading/Evaluation of students:

- 30%, weekly written homework assignments
- 30%, quality of class participation
- 15%, midterm: written critique and evaluation of a scientific manuscript
- 25%, final: grant proposal and reading committee evaluation

We will use the following textbook:

Weeks 1-11:

Population Genetics by Matthew B. Hamilton (Wiley-Blackwell, 2009)

Weeks 12-17:

Evolution 3rd Edition by Douglas J. Futuyma (Sinauer Associates, Inc, 2013)

DATE	WEEK	TENTATIVE TOPIC
9/15	1	Class organization/Introduction/Thinking like a population geneticist-
9/22	2	Genotype frequencies
9/29	3	Genetic drift and effective population size
10/6	4	Genetic drift and effective population size
10/13	5	Population structure and gene flow 1
10/20	6	Population structure and gene flow 2
10/27	7	Mutation
11/3	8	Natural Selection 1
11/10	9	Natural Selection 2 (midterm due)
11/17	10	Mol Evolution 1
11/24	11	Mol Evolution 2
12/1	12	Clades/Trees
12/8	13	Sexual selection
12/15	14	Cooperation and conflict
12/22	15	Speciation
12/29	16	Evo-Devo
		Final exam [grant proposal] due
1/5	17	Coevolution
1/12	18	Grant “reading committee”: Should grant be funded?
		Revision of grant due