Tentative Syllabus
GENE 612 – Population Genetics, Fall 2019 (sec 600) TR 8:00 am – 9:15 am, BSBW B25
Dr. Charles Criscione
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Text: *Genetics of Populations (Fourth Edition),* Philip W. Hedrick (2011) ISBN-13: 978-0763757373. The text is required. There may be questions on exams or homework from readings that will not be covered in class.

Course Description and Prerequisites: Biological approach to genetic characteristics of populations dealing with genetic equilibrium, allelic variation, determination of genetic variation in populations, effects of mating systems, selection, mutation, gene flow and drift on population parameters. Prerequisites: GENE 603 and STAT 651 (or equivalent general introductions to genetics and statistics [covering probability, ANOVA, linear regression, etc.]).

Learning Outcomes: You will be able to: 1) Comprehend basic theory underlying the field of population genetics. 2) Identify, describe, and analyze the evolutionary mechanisms (mutation, genetic drift, selection, gene flow, and non-random mating) and their interactions that shape and/or create genetic diversity and structure within and among populations. 3) Use empirical methods and tools (e.g., software) to elucidate levels and patterns of genetic diversity and differentiation among populations and to infer and asses basic principles shaping population genetic structure. 4) Describe applications of population genetics to various fields such as forensics, molecular ecology, conservation biology, and of course, evolutionary biology.

Examinations and homework: There will be 2 exams (mid and end of semester). There will also be homework/computer assignments (most likely weekly). You will need access outside of class to a computer that uses Windows. See me ASAP if this is a problem.

Grades: Grading is based on 10% in-class participation and 90% of total earned points from homework/assignments, and tests. There will be 2 exams worth 100 points each and 12 homework assignments worth a total of 120 points. Total possible points = 320. The Final grade percentage distribution is 0-59 F, 60-69 D, 70-79 C, 80-89 B, 90-100 A. I do not round averages. **No extra credit will be given.**

Attendance and Make-up Exams: I will tell you everything you need to know to get a good grade in this class during the lectures. Hence, it is very important to attend class if you want to get a passing grade in this course. "The university views class attendance as an individual student responsibility." Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at http://student-rules.tamu.edu/rule07." Make-ups will be given for University-approved absences. You will need written documentation that the absence is excused and will need to contact me to make arrangements as quickly as possible before or after the absence (**send me an email if you are sick and cannot show up on a day an assignment or test is due**).

eCampus: Course materials will be available on eCampus (http://ecampus.tamu.edu/). You will need your NetID account to log on (To activate a NetID account see https://services.tamu.edu/netid-activate/).

I reserve the right to alter the contents on this syllabus. Also, the timing of lectures may be different from the syllabus below, particularly later in the semester. I may move around, add or delete materials. I will notify the class of any changes during the lecture time period and provide any new information or updated syllabi on eCampus.

Tentative Class and Assignment Schedule

Aug 27 Aug 29	Lect 01 Lect 02	Introduction, History, Background Info Probability, Mendelian Genetics, Allele frequency estimation. HW01 given	Ch1-H, Ch1-T, (Ap 1and 2)-T
Sep 3 Sep 5	Lect 03	HW01 discussion, papers given Hardy-Weinberg, measures of genetic variation Paper discussion, HW02 given	Ch 2-H, CH 2-T, assigned references
Sep 10 Sep 12	Lect 04	HW02 discussion Relaxing HW Assumptions, 2 locus HWE (LD intro) HW03 given	Ch 2-H, Ch2-T,(523-540, 581-587)-H
Sep 17 Sep 19	Lect 05	HW03 discussion Inbreeding from nonrandom mating HW04 given	Ch 8 (up to p 480)-H, Ch 3-T
Sep 24 Sep 26	Lect 06	HW04 discussion Systems of inbreeding, Inbreeding & LD, Assortative mating. HW05 given	Ch 8 (up to p480)-H, Ch 3-T, (547-549, 516-523)-H
Oct 1 Oct 3	Lect 07	HW05 discussion, papers given Special Topics: extended HWE probabilities, clonality, estimating selfing, HW06 given	(492-499)-H, assigned references, (461-464)-H
Oct 8 Oct 10		HW06 discussion, paper discussion Exam 1	
Oct 15 Oct 17	Lect 08	 Basic selection models HW07 given	Ch 3 (111-148)-H, assigned reference
Oct 22 Oct 24	Lect 09	HW07 discussion, paper discussion (if time) Selection with multiple alleles, selection and LD, and selection with inbreeding,HW08 given	(149-153)-H, (343-358)-T (552-562)-H, (499-512)-H
Oct 29 Oct 31	Lect 10	HW08 discussion Genetic Drift HW09 given	Ch 4-H
Nov 5 Nov 7	Lect 11	HW09 discussion Drift and LD, Effective population size, Drift with selection or non-random mating, HW 10 given	Ch 4-H, (540-543)-H, assigned references
Nov 12 Nov 14	Lect 12	HW10 discussion, paper discussion (if time) All things Mutation HW11 given	Ch 5-H, (512-515)-H, (543-546)-H
Nov 19 Nov 21	Lect 13	HW11 discussion Gene Flow/Population Structure HW 12 given	CH 7-H, (549-552)-H
Nov 26 Nov 28	Lect 14	HW12 discussion Coalescence/Molecular Evolution Thanksgiving	CH 6-H, CH 5-T, (563-581)-H No class
Dec 3	Lect 14	Coalescence/Molecular Evolution	
Dec 9		Final Exam -- Exam 2	1:00 pm – 3:00 pm