

Biology 4250 – Evolutionary Genetics – Fall 2021

Instructor	Dr Steve Carr	[Sn-3020, x4776; new office TBA scarr@mun.ca]
Lectures	Tu Th 0900 – 1015	Sn-1091
Lab	Th 1400 - 1700	SN-1091

Required text:

G-P Sætre & M Ravient (2019) *Evolutionary Genetics: Concepts, Analysis, and Practice*. Oxford UP. [Available for purchase or e-rental from Amazon.ca]

Website: [<http://www.mun.ca/biology/scarr/Bio4250.html>]

Lecture Topics

Week 1 – Introduction

Week 2 – Allele & Genotype Frequencies; Hardy-Weinberg Expectations

Week 3 – Darwin's Century

Weeks 3 & 4 – General Theory of Natural Selection

Week 5 - Mendel's Century

Weeks 5 & 6 – Types of Evolutionary Genetic Data

Week 6 – Mutation (μ); Migration (m)

Week 7 – Genetic Drift (N) & Effective Population Size N_e

Midterm Exam

Week 8 – Population Structure: F statistics & F_{ST}

Week 9 – Molecular Evolutionary Genetics

Week 10 – Molecular Systematics I: Phylogenetic reconstruction

Week 11 – Molecular Systematics II: Phylogeography in time & space

Week 12 - Bioinformatics

Week 13 - TBA

Supporting Chapters from Sætre & Ravient (2019)

Chap 1 – p & q ; Hardy-Weinberg Proportions

Chap 7 – Natural Selection

Chap 8 – Natural Selection in Finite Populations

(also Chap 10 – Selection II – Kin Selection Etc.)

Chap 2 – Mutation

Chap 2 – Genetic Drift

Chap 3 – Coalescence Theory

Chap 4 – Population Subdivision – F_{ST}

Chap 5 – Demography & Phylogenetic Trees

Chap 11 – Quantitative Genetics [wrt Heritability]

Chap 6 – Linkage Disequilibrium

Chap 9 – Neutral Theory

Grading Scheme

Participation 10%

Labs 30% : 5% @

1. [Statistical analysis](#) of variation
2. Natural Selection: [General Selection Model](#)
3. Natural Selection in [Variable Environments](#)
4. Natural Selection & [Genetic Drift](#) [[MatLab](#)]
5. Population Structure & [F-Statistics](#)
6. Molecular Phylogenetics [[MEGA](#)]

Exams 60%

Midterm	25%	Oct 22 nd , 2020
Final	35%	Dec 11 th , 2020