

Biology 4250 – Evolutionary Genetics – Fall 2024

Instructor	Dr Steve Carr	CSF-4342; x4776 scarr@mun.ca
Lectures	Tu Th 0900 – 1015	C-1053
Lab	Mon 1400 - 1700	TBA

Optional reference text:

G-P Sætre & M Ravient (2019) *Evolutionary Genetics: Concepts, Analysis, & 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; Allele & Genotype Frequencies

Week 2 – Hardy-Weinberg Theorem

Week 3 – Darwinian Theory of Natural Selection

Week 4 – The General Theory of Natural Selection

Week 5 – Advanced Topics in Natural Selection

Midterm Exam - Tuesday, Oct 15

Week 7 & 8 - Mutation (u); Migration (m); Inbreeding (F)

Weeks 9 & 10 - **Mendel's Century**: Genetic data in Evolution

Week 11 - Evolution in finite populations: Genetic Drift (dN) & Effective Population Size N_e

Week 12 – **Phylogeography**: Variation in time & space (F statistics & F_{ST})

Week 13 – Molecular systematics: **Phylogenetics**

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]

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 13 th , 2022
Final	35%	Dec 09 th , 2022