

**Week 1 – Jan 24, 26, 28**

Goal: A review of basic principles: the central place of evolution in biology, evidence and arguments for descent with modification and natural selection.

Readings: Chapters 1-3, Excerpts from Paley, Darwin, Wallace

Activities: Using statistical tools for measuring variation and natural selection.

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**Week 2 – Jan 31, Feb 2, 4**

Goal: To understand the mechanisms behind the generation and maintenance of genetic variation in populations.

Readings: Chapters 4-5

Activities: Simulation of evolution in populations subject to natural selection and mutation; design and plant local ecotype experiment.

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**Week 3 – Feb 7,9,11**

Goal: To understand the effect of subdivision on genetic variation within and among populations.

Readings: Chapter 6

Activities: Simulation of evolution in subdivided populations; analysis of real data sets.

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**Week 4 – Feb 14, 16, 18**

Goals: To explore applications of population structure to conservation.

Readings: Chapters 6, papers from the scientific literature

Activities: Simulation of evolution in subdivided populations; analysis of real data sets.

**Major Assignment: Quiz 1 (Wednesday Feb 16)**

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**Week 5 – Feb 21, 23, 25**

Goals: To understand how the relationships between species are inferred, and how this information is applied to the study of coevolution.

Readings: Chapter 13, scientific papers.

Activities: Comparing methods of phylogeny estimation on real data sets; tracing the evolution of traits on trees; meet with George Weiblen, U. of Minnesota: evolution of plant-insect interactions

**Week 6– Feb 28, March 2, 4**

Goals: To explore the concept of “species” and its relationship to the mechanisms of species formation.

Readings: Chapter 15, scientific papers.

Activity: Take data on local ecotype experiment. Meet with Jean Porterfield, St. Olaf College: genetics and hybridization of native fish

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**Week 7 -- March 7, 9, 11**

Goals: To understand evolution at multiple loci and the ‘problem’ of sexual reproduction.

Readings: Chapter 7 and scientific papers.

Activities: Simulations of evolution at multiple genetic loci. Review results of local ecotype experiment (so far).

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**Major assignment: Phylogeny oral presentation (Wed March 9)**

**Week 8 – March 14, 16, 18**

Goals: To understand concepts of phenotypic heritability and plasticity.

Reading: Chapter 8

Activities: Simulations of selection on quantitative characters. Planning for ant population structure study.

**Major assignment: Quiz 2 (Monday March 14).**

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**SPRING BREAK**

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**Week 9 –April 4, 6, 8**

Goals: To understand ways of testing hypotheses of adaptation; to understand the meaning and importance of phenotypic plasticity to adaptation.

Readings: Chapter 9

Activities: Ant collection and testing of methods.

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**Week 10 – April 11, 13, 15**

Goals: To explore theories of the origin of life and early diversification of life forms;

Readings: Chapter 16

Activities: Data gathering for ant population structure project.

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**Week 11 – April 18, 20, 22**

Goals: to understand the roles of radiation and extinction in shaping patterns of diversity

Readings: Chapter 17

Activities: Data gathering and analysis of ant population structure project

**Major assignment: Quiz 3 Friday April 22**

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**Week 12 -- April 25, 27, 29**

Goals: To understand the importance of developmental changes in macroevolution

Readings: Chapters 18 and reading from Robert Richards

Activities: Ant population structure data analysis

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**Weeks 13 and 14 – May 2, 4, 6, 9, 11, and 13**

Goals: To explore the recent controversies over the genetics of human “races”

Readings: Chapter 19 and papers

Activities: Data gathering and analysis of local ecotype experiment

**Major assignment due: Ant population structure poster due Monday May 2**

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**Finals week: Local ecotype grant proposal due Friday May 20 12 noon.**