

**Outline**

Course will meet for two consecutive hours each week. Either two lectures, or one lecture followed by a discussion. Course materials will be posted on Chalk (<http://chalk.uchicago.edu/>). Office hours to be decided.

Texts: no text is followed closely, but the following may be useful.

1. Crow, J. F. 1986. Basic Concepts in Population, Quantitative, and Evolutionary Genetics. W. H. Freeman and Co., San Francisco, CA.
2. Falconer, D.S., and T.F.C. Mackay. 1996. Introduction to Quantitative Genetics. 4th ed. Prentice Hall, Harlow, U.K.
3. Conner, J. K., and Hartl, D. L. 2004. A Primer of Ecological Genetics. Sinauer

**Week 1.**

- 1: Mean, variance, covariance, regression, correlation.
- 2: Selection in nature.

Reading for week 2: Shuster, S. M. and Wade, M. J. 1991 Equal mating success among male reproductive strategies in a marine isopod. *Nature* 350: 608-610.

**Week 2.**

- 3: Covariance, correlation and regression. Model of selection on discrete characters.
- 4: Discussion of paper.

**Week 3.**

- 5: Price's theorem and Fisher's fundamental theorem. Adaptive surface.
- 6: Darwin's finches.

Reading for week 4: Mallet, J. and Barton, N. H. 1989 Strong natural selection in a warning-color hybrid zone. *Evolution* 43: 421-431.

**Week 4.**

- 7: Heritability. Resemblance among relatives.
- 8: Discussion of paper.

**Week 5.**

- 9: Mean fitness and the adaptive surface. Response to selection.
- 10: Multiple regression and the multivariate model.

Reading for week 6: Lande, R. 1979. Quantitative genetic-analysis of multivariate evolution, applied to brain - body size allometry. *Evolution* 33: 402-416

**Week 6.**

- 11: Pleiotropy and genetic covariance. Path analysis. Oct 31

12: Discussion of paper

**Week 7.**

13: Selection on condition            Nov 7

14: Life-history traits

Reading for week 8: Foerster, K., T. Coulson, B. C. Sheldon, J. M. Pemberton, T. H. Clutton-Brock, and L. E. B. Kruuk. 2007. Sexually antagonistic genetic variation for fitness in red deer. *Nature* 447:1107-1109.

**Week 8.** Phenotypic plasticity and genetic assimilation. Nov 14

Hour 2: Discussion of paper

**Week 9.** Sexual selection and sexual dimorphism. Nov 21

Reading for week 10:

Lande, R. 1980. Sexual dimorphism, sexual selection, and adaptation in polygenic characters. *Evolution* 34: 292-305.

Schluter, D. and T. Price. 1993. Honesty, perception and population divergence in sexually selected traits. *Proc. Roy. Soc. London B* 253:117-122.

**Week 10.** General discussion. Dec 4