

## Biology 321/4 EVOLUTION 2016 Syllabus

Lectures Wednesday, Friday @ 10.15 - 11.30 in CC 111

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Tutorials: 1) Wednesday 13.15 - 15.15 CC 314  
2) Thursday 13.15 - 15.15 CC 305

**Required Text:** *Evolution* Authors C. T. Bergstrom and L.A. Dugatkin

This course is an introduction to the history, tools, logic and issues in evolutionary studies.

For Biologist, evolution is a fact. It provides an explanation of the diversity of different species around us with which we also happen to share visible characters and less obvious gene sequence. At the same time, the process of evolution involves theories with history, principals and predictions that are now being tested at molecular, developmental, population and species-level.

Prior to Darwin's 1859 publication of *On the Origin of Species*, nature was conceived and modeled as an ideal typology, wherein actual organisms have an imperfect correspondence to an otherwise ideal individual type. This idea still organizes museum collections of species. Traditionally, they are defined with reference to a type specimen, often the first complete individual that defines a new species and serves as reference for the unique features of a species.

Darwin rejected this *metaphysical concept (based on faith and not testable by physical processes)*. Rather than ideal archetypes, he replaced it with a *material one*, arguing that actual variation among actual organisms is the most essential and illuminating fact in nature. In other words, character diversity within populations and between species is the fundamental outcome of population processes that lead to diversification and/or extinction.

In his annotated review (*Structure of Evolutionary Theory*), S. J. Gould argued that Charles Darwin made 3 fundamental claims in '*On the Origin of Species*', under discussion since 1859:

- (1) Agency- evolution happens in populations (microevolution)
- (2) Efficacy - natural selection is the main mechanism of evolutionary change.
- (3) Scope - all evolutionary change can be attributed to microevolution .

We will use *Agency, Efficacy and Scope*, to headline the major sections of this course examining *models, mechanisms, and scales* of evolutionary processes.

### MARKS

EXAMS 75%

Midterm 25%

*Final Exam 50%*  
**TERM WORK 25%**  
*Tutorial Assignments - 13%*  
*Participation 2%*  
*On the Origin of Species -Section Review: Written (5%) Oral (5%)*