

EVOLUTIONARY BIOLOGY

Outline of Topics:

INTRODUCTION –

- What is evolution?
- Evolution as fact and theory

DECIPHERING THE HISTORY OF LIFE –

- Rocks as records of earth history
- Continental drift and plate tectonics
- The fossil record
- Phylogenetic inference
- Molecular phylogeny
- Historical biogeography

EVOLUTIONARY PROCESS –

- The link between genotype and phenotype
- Origin of variation
- Fitness and adaptation
- Natural selection
- Population structure and genetic drift
- Integration of evolutionary forces

EVOLUTION OF GENOTYPE AND PHENOTYPE –

- Neutral theory of molecular evolution
- Genome evolution
- Genetics of development
- Life history evolution
- Evolution of sex

SPECIATION –

- What are species?
- Origin of barriers to gene exchange
- Models of speciation
- Case histories of speciation

MACROEVOLUTION –

- Rates of evolution
- Phyletic gradualism and punctuated equilibrium
- Development and evolution
- Patterns of diversity through the fossil record
- Extinction
- Human evolution