

**By the end of this course students should be able to do the following:**

- **Explain the major components of the modern theory of evolution, and explain the lines of evidence indicating that evolution is responsible for generating biological diversity.**
- **Explain why spontaneous mutations seem not to be “Lamarckian.”**
- **Explain how the chromosomal dynamics during meiosis leads to segregation, independent assortment, and linkage.**
- **Analyze the result of crosses to determine the genetic basis of discrete, Mendelian variation in traits.**
- **Analyze the result of crosses to determine the location of genes on chromosomes.**
- **Explain how we can tell whether Mendelian factors underlie variation in complex, quantitative traits.**
- **Distinguish between natural selection and genetic drift as causes of evolutionary change.**
- **Explain the difference between individual selection, sexual selection and kin selection.**
- **Predict whether a mutation will spread through a population and species.**
- **Analyze sequence data to determine whether genes have experienced selection.**
- **Explain how analyzing genome sequence variation can lead to the discovery of genes that contribute to human adaptation and disease.**
- **Explain mechanisms by which one biological species splits to become two reproductively isolated species.**
- **Construct phylogenies and use them to infer patterns of character evolution and to test hypotheses about evolutionary processes.**

**These are general learning objectives that apply to the entire course. More specific learning objectives will be listed for each lecture.**