INSTRUCTORS:
Bruce S. Cushing, Ph.D. and Janet Norcross, Ph.D.

COURSE OBJECTIVES
The goal of this course is to provide a basic understanding of the concepts and effects of evolution, the unifying theme of biology. Following completion of the course, you should be able to effectively discuss the scientific foundations of evolution within a secondary classroom environment or an introductory science course at the college level. Basic ideas to be addressed include understanding what a scientific theory is, and how this concept applies to evolution, genetics, and mutations. Mechanisms of evolution that are discussed include natural selection, individual and group selection, sexual selection, the role of non-genomic influences in gene expression, and speciation. While the concepts of evolution are straightforward and logical, evolution can be a controversial topic within society and secondary education programs. Misrepresentation of evolutionary concepts will be discussed to better enable you to address these issues as a teacher.

TEXT
We will be using EVOLUTION: AN INTRODUCTION, 2nd edition, Stearns and Hoekstra, 2005, Oxford University Press: Oxford

WEEKLY MODULES
This course consists of 11 “Modules,” which will be released approximately weekly. Each module consists of Goals, Text Readings, links to Internet sites reviewing key concepts, and popup-type pages that define unfamiliar terminology. Most modules require you to complete an Assignment, such as a written thought question or a quiz, or to participate in group discussions.

ASSIGNMENTS AND EXAMS
Quizzes and Discussion Questions
At the end of each module you will be asked to either answer discussion/thought questions extending the material in the module, take a brief quiz after reading a supplemental scientific journal article, or participate in a group discussion. Some independent research is expected.

Innovative Classroom Exercise in Reproduction (ICEE)
As part of your learning experience, you will participate in the design of an original classroom activity or exercise (ICEE), along with a lesson plan, based upon material relevant to this course. This will be a small group project and will be due about two weeks before the end of the course. Completed projects will be the viewed by the entire class.
**Exams**
There will be two exams, a midterm and a non-comprehensive final. These exams will be open book, but you are not allowed to discuss or interact with another student or person when taking the exams.

**CLASS GRADES**
The final grades are assigned according to a standard percentage scale.

**TOPICS AND EXAM SCHEDULE**
The following is a list of the topics, the order we will be covering them in, and associated Chapters from our text. Please refer to the Calendar for Module opening and closing dates, and assignments.

**UNIT 1. INTRODUCTION TO EVOLUTION**
- Module 1 Evolution - A scientific theory - and Reproduction

**UNIT 2. GENES THE BUILDING BLOCKS OF EVOLUTION**
- Module 2 Genes and Mutations
- Module 3 Hardy-Weinberg equilibrium - Proof of Evolution

**Unit 3. EVOLUTION BY NATURAL SELECTION**
- Module 4 Darwin and Lamark and Individual Selection and Fitness
- Module 5 Kin and Group Selection

(Midterm Exam)

**Unit 4. OTHER MECHANISMS OF SELECTION**
- Module 6 Sexual Selection
- Module 7 Trans-generational epigenetic regulation of gene expression
- Module 8. Haeckel's Law and the Fossil Record

**Unit 5. SPECIATION**
- Module 9 Macroevolution - the process of Speciation
- Module 10 – Mechanisms of Speciation
- Module 11 – Other considerations – tools to politely deal with non-believers

(FINAL EXAM)