OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE: January 1997
COURSE REVISED IMPLEMENTATION DATE: September 2012
COURSE TO BE REVIEWED: February 2018
(six years after UEC approval) *(month, year)*

OFFICIAL UNDERGRADUATE COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department – see course syllabus available from instructor

BIO 416	Biology	3
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

Evolution
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

Evolution is conceptually the single most important biological discipline because it ties together all fields of biology. This course is an investigation of the mechanisms and processes of the evolution of biological organisms. The history and development of evolutionary thought and contemporary issues are discussed.

PREREQUISITES: BIO 210 and BIO 220, and any 300- or 400-level biology course.
Note: As of September 2013 prerequisites will change to the following: BIO 210 and BIO 220, and any three 300- or 400-level biology courses.

COREQUISITES:
PRE or COREQUISITES:

SYNONYMOUS COURSE(S):
(a) Replaces: **N/A**
(b) Cross-listed with:
(c) Cannot take: **N/A** for further credit.

SERVICE COURSE TO: *(department/program)*

TOTAL HOURS PER TERM: **45**

STRUCTURE OF HOURS:

Lectures:	**15**	Hrs
Seminar:	**30**	Hrs
Laboratory:		Hrs
Field experience:		Hrs
Student directed learning:		Hrs
Other (specify):		Hrs

TRAINING DAY-BASED INSTRUCTION:
Length of course:
Hours per day:

OTHER:
Maximum enrolment: **24**
Expected frequency of course offerings: Annually
(every semester, annually, every other year, etc.)

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☒ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

Course designer(s): **Allan Arndt**

Department Head:	**Sharon Gillies**	Date approved:	**March 17, 2010**
Supporting area consultation		Date of meeting:	**March 26, 2010**
Curriculum Committee chair:	**Norm Taylor**	Date approved:	**December 16, 2011**
Dean/Associate VP:	**Ora Steyn**	Date approved:	**January 13, 2012**
Undergraduate Education Committee (UEC) approval		Date of meeting:	**February 3, 2012**

LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to:

1. Explain the central role of evolutionary theory to all of biology.
2. Evaluate the impact of gene distribution in populations on evolution, adaptation, natural selection and speciation.
3. Interpret empirical data and critique scientific papers.
4. Analyze and recognize evidence of common ancestry.
5. Sythesize evidence of change through time.
6. Construct a phylogenetic tree as a graphical summary of species evolution.
7. Explain the significance of genetic variation in natural populations.
8. Explain the mechanisms of evolutionary change.
9. Manipulate allele frequencies in order to determine Hardy-Weinberg Equilibrium for a population.
10. Calculate heritability of traits and predict evolutionary response to selection.
11. Identify how adaptation is studied in evolutionary biology.
12. Define a species using different species concepts.
13. Reconstruct the fossil record of a species.
14. Recognize macroevolutionary patterns present in the fossil record.
15. Explain the significance of the Cambrian Explosion.
16. Recognize the central role homeotic genes plan in the organization and diversification of animal and plant body plans.

METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

A combination of lectures, case studies, small group research, student presentations and written assignments.

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☒ Examination(s) ☐ Portfolio assessment ☐ Interview(s) ☐ Other (specify):

☐ PLAR cannot be awarded for this course for the following reason(s):

TEXTBOOKS, REFERENCES, MATERIALS: *[Textbook selection varies by instructor. Examples for this course might be:]*

Evolution D. Futuyma, Sinauer, 2005
Assigned readings from primary literature.
Additional Reading Resources:
Briggs Palaeobiology: A Synthesis
Calow Evolutionary Synthesis
Carroll Vertebrate Palaeontology and Evolution
Cockburn Introduction to Evolutionary Ecology
Dawkins The Selfish Gene
The Extended Phenotype

Gould Wonderful Life
Nisbet Living Earth
Stewart Palaeobotany and Evolution of Plants
Stickberger Evolution
Weiner The Beak of The Finch
Wilson & Bossert A Primer of Population Biology

SUPPLIES / MATERIALS:

STUDENT EVALUATION: *[An example of student evaluation for this course might be:]*

Term Paper	25%
Seminar Presentation	10%
Phylogenetic analysis assignment	5%
Midterm Exam	25%
Final Exam	35%

COURSE CONTENT: *[Course content varies by instructor. An example of course content might be:]*

Fossil Record
Darwin's Theories
Natural Selection
Mechanisms of Inheritance
Neo-Darwinism
Population Genetics
Hardy-Weinberg Equilibrium
Quantitative Genetics
Species Concepts and Speciation
Phylogenetic Systematics
Molecular Evolution
Development and Evolution
Coevolution
Sexual Selection
Punctuated Equilibrium
Human Evolution