

University of Jordan  
Department of Biology

Evolution (0304464)  
Spring 2014 syllabus

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This class is worth three credits (three  
one hour lectures per week)

### Study Material

#### A. Books and articles

1. Campbell, N.A., Reece J.B., *et al.* 2008. Biology, 2nd ed. Pearson.
2. Futuyma, D.J. 2009. Evolution. 2nd ed. Sinauer Associates. (Or earlier editions of Futuyma's textbooks.)
3. Gibbons. A. 2010. Paleogenetics: Close encounters of the prehistoric kind. *Science*, 328: 680 – 684.
4. Gould, S. J. and Lewontin, R. C. 1979. The spandrels of San Marco and the Panglossian paradigm: a critique of the adaptationist programme, *Proceedings Of The Royal Society of London, Series B, Vol. 205, No. 1161 (1979), Pp. 581-598.*
5. Mayr, E. 1994. Typological versus Population thinking. In Sober, E. (ed.) *Conceptual issues in evolutionary biology.* The MIT Press.
6. Pigliucci, M. 2002. *Denying evolution: creationism, scientism, and the nature of science.* Sinauer Associates.
7. Ruse, M. Sep 9, 2010. George C. Williams (1926-2010) [An obituary]. *The Chronicle of Higher Education.*
8. Sober, E. 1994. (ed.) *Conceptual issues in evolutionary biology.* The MIT Press.
9. Wade, N. Sep 13, 2010. George C. Williams, 83, Theorist on Evolution, Dies. *The New York Times.*
10. Various articles, handouts and films assigned in time.

#### B. E-sources and audiovisuals

1. Rediscovering Biology: Molecular to global perspectives.  
<http://www.learner.org/courses/biology/index.html>
2. PBS's evolution library.  
<http://www.pbs.org/wgbh/evolution/library/index.html>
3. What Darwin Never Knew (Nova documentary, 2010)





## Assessment

### Description

Attendance, participation,  
assignments and quizzes

Midterm exam

Final exam

### Weight

20%

30%

50% (including 10% for midterm  
exam material)

## Course Schedule

Week	Topics	Readings	Assignments/ Activities
1, 2	<b>Introduction to the course; Philosophy of science: the demarcation problem; observation; experiment; hypothesis; theory; induction; hypothetico-deductive method; analytical method; reductionism; materialism; parsimony</b>	Campbell, chap 1 Pigliucci, chap 4  Recommended: Futuyma, chap 22	
3, 4	<b>Evolutionary theory: Scala Naturae; Linnaeus; Lamarck; uniformitarianism; Malthus; descent with modification; natural selection; the modern synthesis</b>	Campbell, chap 22; Mayr, 1994  Recommended: Futuyma, chap 1	Rediscovering Biology, Unit 3: Evolution and Phylogenetics
5, 6	<b>Population genetics: genetic variation; Hardy-Weinberg; genetic drift; gene flow; natural selection; adaptation; sexual selection</b>	Campbell, chap 23 and chap 51, section 51.4 Gould and Lewontin, 1979  Recommended: Futuyma, chap 9, 10, 11, 12	
7, 8	<b>Speciation: reproductive isolation; allopatric speciation; sympatric speciation; hybrid zones; mode and tempo of evolution; macroevolution</b>	Campbell, chap 24  Recommended: Futuyma, chap 15, 16	
	<b>Midterm exam</b>		





9, 10	<b>Paleontology: fossils; fossil dating; Key events: chemical evolution; prokaryotes; photosynthesis; aerobic respiration; eukaryotes; endosymbiosis; multicellularity; Cambrian explosion; colonization of land; adaptive radiation; vertebrate evolution; mass extinctions; human evolution; orthogenesis</b>	Campbell, chap 25 (minus 25.5)  Recommended: Futuyma, chap 4, 5, 6, 7	Rediscovering Biology, Unit 9: Human Evolution
11, 12	<b>Evolutionary development and genome evolution</b>	Campbell, chap 25, section 25.5  Recommended: Futuyma, chap 20	What Darwin Never Knew;  Rediscovering Biology, Unit 7: Genetics of Development
13, 14	<b>Phylogeny and taxonomy</b>	Campbell, chap 26  Recommended: Futuyma, chap 2	Rediscovering Biology, Unit 3: Evolution and Phylogenetics
15	<b>Kin selection: altruism; inclusive fitness; social learning</b>	Campbell, chap 51, section 51.5  Recommended: Futuyma, chap 14	
	<b>Final Exam</b>		

