THE HONORS COLLEGE
VERSION: January 20, 2015

Course: BIOL3923H, HIST 3923H and ANTH 3923H: ***The Darwin Course***
Semester: Spring 2015
Time: Tu/Th 4:30-5:50pm AGRI 301A
Credits: 3
Professor*: William F. McComas, Ph.D.
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*This is a highly integrated class with contributions from many instructors. Although Dr. McComas is the lead instructor, we encourage you to contact and interact with any of the instructors (listed with a brief biography in the appendix to this syllabus).

Course Description:

Few things worth knowing well can be understood from a single dimension, yet many university courses provide singular views with the resulting focus on depth rather than breath. Such depth can be powerful but is necessarily limited. The Darwin Course will focus on Charles Darwin and his discovery of a major mechanism for evolution but it is specifically designed to draw on the intellectual strengths and expertise of a variety of UA faculty members to provide the most complete view possible. The course will examine Darwin, his life and times, the philosophical implications of the interface between science and religion, the impact of evolution on literature, the science of evolution, and legal issues resulting from the inclusion of evolution in school science curricula. Faculty members who will be part of the instructional team have expertise in history, biology, philosophy, physics, literature, law and science education. The resulting highly interdisciplinary course should appeal to and challenge honors students possessing a wide diversity of interests and demonstrate that the most complete understanding of any topic comes by crossing disciplinary boundaries.

REQUIRED TEXTS

Pallen, M. (2009). *The Rough Guide to Evolution*. London: Rough Guide Press.

Many other readings will be provided to you in digital form. Please make sure that you read the assigned articles, papers and/or book chapters before coming to class for the review and discussion of the relevant issues.

Also, we would like you to review two videos that are available on line. The first is a recent debate between Bill Nye (pro-evolution) and Ken Hamm (anti-evolution). This may easily be found simply by searching "Nye Hamm evolution debate." We would also like you to watch the presentation by Steve Clark attorney general of Arkansas during the Arkansas evolution trial (the link will be provided soon).

RELEVANT WEBSITES

https://www.darwinproject.ac.uk/ On this site you can read and search the full texts of more than 7,500 of Charles Darwin's letters, and find information on 7,500 more. The site contains complete transcripts of all known letters Darwin wrote and received up to the year 1869 with more added as the become available.

http://darwin-online.org.uk/ This site features all of Darwin's publications and manuscripts. It also includes Darwin's private papers (notebooks, journals, diaries) and supplemental works by other authors.

The Darwin Course: UA Honors College
Tu/Th Classes 4:30-5:50pm
Spring 2015

Please note that several instructors may have made similar reading assignments from the two textbooks *Darwin: A Very Short Introduction* and *Evolution: A Very Short Introduction*. When this occurs, please read the assigned selection carefully the first time and review if and when the material is assigned subsequently. In all cases, please read the material for any given class BEFORE coming to class on that day. In the cases where all readings appear on the first day of class with a particular instructor, please read all papers for the week before the first lecture by that instructor. Since this is the first time the class has been taught we reserve the right to add or subtract from the readings provided here.

Week #1 (McComas)

JAN/13 **Charles Darwin: An Introduction to the Man and *The Darwin Course***
Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 15-58).

1-1 King, D.C. (2008). Selection "The Making of a Naturalist" from *Charles Darwin: a photographic story of a life.* NY: DK Publications.
1-2 Price, B. (2005) Selection from *Darwin: Origin and Argument*.

1/15 **Charles Darwin: Naturalist to Scientist**

Week #2 (Terhune and Delezene)

JAN/20 **Antecedents of Darwinian Evolution** (Evolution up to Darwin) Part I
Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 3-14).

2-1 DeCamp, L.S. (1968). Great Monkey Trial (Chapter). New York: Doubleday.
2-2 Mayr, E. (1982). *Growth of Biological Thought (Pages* 84-112, 301-309, and 166-182). http://www.explorelifeonearth.org/cursos/Mayr1982GrowthofBiologicalThought.pdf.

JAN/22 **Antecedents of Darwinian Evolution** (Evolution up to Darwin) Part II

2-3 http://embryo.asu.edu/pages/essay-cuvier-geoffroy-debate
2-4 http://www.ucl.ac.uk/taxome/jim/Mim/lamarck_contents.html (Sections on "Disbelief in the extinction of any species except those directly extirpated by man" and "Evolution by use and disuse of parts: Lamarck's first and second laws"; students can read other sections as well if they wish, but we will focus on these two)

2-5 Chapter 1 from "An Essay on the Principle of Population", by Thomas Malthus available at http://embryo.asu.edu/pages/essay-cuvier-geoffroy-debate

Week #3 (McComas)

JAN/27 **Darwin, the Voyage of the Beagle and Home (Life, Work and Synthesis)**
Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 15-48).

3-1 McComas, W. F. (1997). The discovery and nature of evolution by natural selection: Misconceptions and lessons learned from the history of science. *American Biology Teacher, 59* (8), 492-500.
3-2 King, D.C. (2008). Selection from *Darwin* on the Voyage of the Beagle.
3-3 Darwin, C. Please go to the website listed and choose two chapters from Darwin's account of the *Voyage of the Beagle* and read them.

Take note of the Darwin's writing style and the things he pays attention to. It would be very nice if you could coordinate with others in the class to cover the entire book two chapters at a time. If you want a real treat from a detective perspective, you can read Darwin's own *Beagle Diary* and compare that to the first addition of the *Voyage of the Beagle* and to the second edition of the *Voyage*. For instance, it is revealing to note when the famous finches are finally mentioned?

JAN/29 **Evolution as Darwin Saw It**
Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 49-104).

3-4 King, D.C. (2008). Selection from *Charles Darwin: a photographic story of a life.* NY: DK Publications on Post-Voyage, Pre-Origin.
3-5 King, D.C. (2008). Selection starting with "Delay and Completion" from *Charles Darwin: a photographic story of a life.* NY: DK Publications.
2-3 Kutschera, U. (2003). A comparative analysis of the Darwin Wallace papers and the development of the concept of natural selection. *Theory BioSci* 122, 343-359

Week #4 (Etges)

FEB/3 **Evolution after Darwin**
Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 104-146).

FEB/5 **Evolution: Implications in and for the Modern World**

Note; for the next two weeks we will toggle between professors Ward and Kennefick because Dr. Ward couldn't be with us on Thursdays.

Week #5 (Ward and Kennfeick)

Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 238-244).

FEB/10 **Science, Pseudoscience and Evolution** (Ward)

5-1 Kitcher, Philip (1982), *Abusing Science*, Chapter 2 (pp. 30-54). Cambridge, MA: MIT Press.

FEB/12 **The Darwin Paradigm**

5-2 Quamman (2008) The man who wasn't Darwin. National Geographic.
5-3 Evolution: A very short Introduction by Brian and Deborah Charlesworth. First part of Chapter 4 on Age of the Earth & Evidence for Evolution: Patterns in Time and Space.
5-4 Chapter 1 of J. D. Burchfield (1990) Lord Kelvin and the Age of the Earth. Part of Chapter 4 and all of Chapter 5 of J. D. Burchfield (1990) Lord Kelvin and the Age of the Earth (Note: 5-5 and 5-6 are optional)

Week #6 (Ward and Kennefick)

FEB/17 **Explaining where we cannot Predict** (Ward)

FEB/19 **Darwin's Problem: The Age of the Earth** (Kennefick)

Please read the following articles in the packet of readings provided from *Scientific American*

- Introduction by Paul Braterman
- Source of the Sun's Heat abstract of an article by William Thomson (March 1857)
- How long has the Sun shone and how long will it continue to shine? - March 1862
- Note on Sir William Thomson's Arguments For the Age of the Earth (August 1877)
- Lunar Disturbance of Gravity (January 1882)
- The Age of the Earth by Adolphe d'Assier (March 1889)
- Estimates of Geologic Time by Warren Upham (1850-1934) (April 1893)
- The Age of the Earth by John Perry (May 1895)
- Concerning the Age of the Earth by H. V. Hilker (April 1923)
- The Age-of-the-Earth debate by Lawrence Badash (August 1989)

Week #7 (Plavcan)

FEB/24 **Human Evolution (Part I)**
Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 180-212).

7-1 White, T.D., Asfaw, Berhane, Haile-Selassie, Y., Lovejoy, C. Owen, Suwa, Gen, and WoldeGabriel, Giday (2009) *Ardipithecus ramidus* and the paleobiology of early hominids. Science 326: 75-86
7-2 Wood, Bernard, and Lonergan, Nicholas (2008) The hominin fossil record: taxa, grades and clades. Journal of Anatomy 212: 354-376.

FEB/26 **Human Evolution (Part II**)

7-3 Klein, R. (2008) Out of Africa and the evolution of human behavior. *Evolutionary Anthropology 17*: 267-281.
7-4 McHenry, H. M. and Coffing, K. (2000) *Australopithecus* to *Homo*: Transformations in body and mind. *Annual Review of Anthropology* 29: 125-146.
7-5 Stringer, C. (2012) The status of *Homo heidelbergensis* (Schoetensack 1908) Evolutionary *Anthropology 21*(3): 101- 107.

Week #8 (Lyons)

MAR/3 **Evolution, Science and Religion (Part I)**

Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 276-285 and 295-308).

8-1 Pigliucci, M. (2002). *Denying Evolution*, Chapter 2.
8-2 Behe, M.J. (1997). Molecular Machines: Experimental support for the design inference.

MAR/5 **Evolution, Science and Religion (Part II)**

8-3 Gould, S.J. (March, 1997). Nonoverlapping magisteria. *Natural History Magazine*.
8-4 Dawkins, R. (2003). The great convergence from *A devil's chaplain*. (Houghton Mifflin)
8-5 Pius XII (1950). *Humani Generis*.

Week #9 (Jolliffe)

MAR/10 and MAR/12 **Darwin, Evolution and Religion: The Literature Connection**

Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 244-257).

9-1 Rauch, A, (2002). Poetry and Science from R. Cronin, A. Chapman and A. Harrison, Eds. A Companion to Victorian Poetry. Oxford: Blackwell.
9-2 Shaw, W. D. (2002). Poetry and Religion from R. Cronin, A. Chapman and A. Harrison, Eds. (2002). A Companion to Victorian Poetry. Oxford: Blackwell.

Professor Jolliffe will distribute the following poems in class for discussion:

Alfred Tennyson, "Two Voices" and "By an Evolutionist"
Robert Browning, "Caliban Upon Setebos"
Thomas Hardy, "Hap," "A Plaint to Man," and "Drinking Song"

Week #10 (Sonn)

MAR/17 **Social Darwinism**

Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 264-275).

10-1 Howard, J. (1982). *Darwin: A Very Short Introduction*. Read Chapters 6 and 8.
10-2 Olson, R.G. (2008). Social Darwinisms and Other Evolutionary Social Theories in *Science and Scientisim in Nineteen-Century Europe.* Chapter 9 (pp. 250-274). Chicago: University of Illinois Press.
10-3 Sonn, R.D. (2010). Chapter 5. Your Body is Yours: Anarchism, Birth Control and Eugenics in *Sex, Violence and the Avant-Garde: Anarchism in interwar France*. (pp. 117-133). Pennsylvania State University Press.

3/19 **Eugenics and Other Abuses of Evolution**

***** MAR/24 Spring Break (No Class) *****
***** MAR/26 Spring Break (No Class) *****

Week #11 (Maxwell)

MAR/31 **Long Shadow of Scopes: Monkey, Media and Moral Majority**

Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 281-283).

11-1 Bailey, K.K. (November 1950). The Enactment of Tennessee's Anti-Evolution Law" J. *of Southern History, 16,* 472-490.
11-2 Moran, J.P. (February 2004). The Scopes trial and Southern fundamentalism in black and white: Race, region and religion. *J of Southern History*, 70, 95-120.

ARP/2 **The Evolution of Dayton: Marketing Creationism**

11-3 Maxwell, A. (2014). The Indicted South: Public Criticism, Southern Inferiority, and the Politics of Whiteness. University of North Carolina Press.

Week #12 (Chadick)

APR/7 **Evolution and the Law: Scopes and Beyond**

Readings: Pallen, M. (2009). *The Rough Guide to Evolution* (Pgs. 285-295).

12-1 Review Larson, Edward J., The Scopes Trial and the Evolving Concept of Freedom, 85 Va. L. Rev. 503 (April, 1999), Sections II through IV (highlighted).
12-2 *Scopes v. State*, 154 Tenn. 105, 289 S.W. 363 (Tn. 1927), highlighted portions.
12-3 Moore, R. (2000). In the Light of Evolution: Science Education on Trial. National Association of Biology Teachers, Chapters 3, 5, and 8; Appendices 1 and 2.
12-4 *Kitzmiller v. Dover Area School Dist.*, 400 F. Supp. 2d 707 (MD Penn. 2005), highlighted portions.

APR/9 **Evolution and the Law: Little Rock and Dover**

Before this session, please watch the presentation by Steve Clark (who now lives in Fayetteville) who was the Attorney General of Arkansas during the Arkansas Evolution Trial. I will provide the web link when it is available.

Week #13 (McComas)

APR/14-16 **Making Sense of it all: Darwin and Evolution**

13-1 McComas. W. F. Philosophical Challenges to Evolution from McComas, W. F. (Ed.) (2006). Investigating Evolutionary Biology in the Laboratory: A Complete Guide to Enhancing Laboratory Instruction. Dubuque, IA: Kendall/Hunt Publishing Co.
13-2 McComas, W.F. (2012, February). Darwin's invention: Inheritance and the "mad dream" of pangenesis. *American Biology Teacher 74*(2), 86-91.
13-3 McComas, W.F. (2012, March). Darwin's error: Using the story of pangenesis to illustrate aspects of the nature of science in the classroom. *American Biology Teacher 74*(3), 151-156.

Week #14 (Faculty)

APR/21 **Student Presentations (Part I)**
APR/23 **Student Presentations (Part II)**

Week #15 (Faculty)

APR/28 **Student Presentations (Part III)**

APR/30 **Student Presentations (Part IV)**

MAY/5 **Final Examination** (Tentative Date)

Final grades in ***The Darwin Course*** will be based on the following (260 points):

- **Class participation** (1 pts x 30 class sessions) (30 pts). You will receive one points for each class in which you make a contribution through your participation and attendance. Please note that it is impossible to participate if you are not present in class no matter the reason.

- **Quizzes** (announced) (15 pts x up to 4 quizzes) (60 pts). You must be present in class to take the quiz. In other words there will be no makeup opportunities for those who are absent.

- **Lab Report on Radiometric Decay (20 pts).** We will begin the lab in class and you will likely complete it at home and hand it in on Feb 24th. The lab should be written up on "lab report format" (see attached example sheet).

  Semester Paper (60 pts). Due Week #13B. Each student will select a different paper prompt and write a 3000 word paper that significantly addressed the prompt. Please ask the instructor who provided the question if they have a preferred citation style. If there is no preference, you are expected to consistently use some well-known style such as APA, MLA or Chicago both for the both of the paper and the references section. Please cite only those references that you fundamentally make use of (in other word do not pad your reference section with works that you briefly read or passed by in the library or on line). Please use primary and other scholarly sources and avoid the temptation to disguise Wikipedia or other on-line sources as your own work. Keep in mind that almost every word that Darwin wrote is available on line and you should make use of the two websites recommended earlier. It is impossible to suggest how many references you should use but somewhere around 15 at minimum would seem a good target.

  Be sure to give proper credit to all ideas (and quotes with page numbers) that you borrow from others. Please double space with using 11-12pt font size. Use 1" margins all around and avoid excessive white space (blank lines) within the document. Please do not use any special binders – just hand in your paper connected together with a staple in the upper left hand corner but be sure to include your name, the title of the paper and the name of the professor who suggested the topic on the first page. Your paper will be evaluated by the professor who suggested the topic using a common reporting format.

- **Presentation** (30 pts). In class you will present the thesis and three main points of your paper. You can use any presentation style/format/technique that you like. Your presentation will be evaluated by all of the students in the class using a common reporting format.

- **Evolutionary Thinking** (20 pts). On or before Week #13 you will turn in a short paper listing and briefly discussing 5 things that you encountered in this class that you found particularly thought provoking, interesting, confusing or otherwise challenging.

- **Final Exam** (60 pts). The final examination will be scheduled during the posted official final exam schedule to be released later in the semester. The final will be comprehensive, with items provided by all members of the instructional team.

Please examine the class policy regarding final grades in Appendix C. In brief, letter grades are based on a percentage of the total on a 9 point scale for each letter (i.e. 91-100% = A, 82-91% = B, etc.)

Appendix A
Darwin Course: Paper Prompts

Chadick, Vince

VC1) Aristotle wrote: "Now, it is of great moment that well-drawn laws should themselves define all the points they possibly can and leave as few as may be to the decision of the judges; and this for several reasons… [L]aws are made after long consideration, whereas decisions in the courts are given at short notice, which makes it hard for those who try the case to satisfy the claims of justice and expediency. The weightiest reason of all is that the decision of the law-giver is not particular but prospective and general, whereas members of the assembly and the jury find it *their* duty to decide on definite cases brought before them." *Rhetoric*, Book I (W. Rhys Roberts translation).

Considering what you have learned about treatment by courts and by legislative bodies (whether state or local, including school boards) of Darwin and evolution science, evaluate Aristotle's conclusion. Specifically, are legislative bodies most capable of promulgating "well-drawn laws"? Are the decisions of court always given at "short notice," making it "hard for those who try the case to satisfy the claims of justice and expediency?

In defending your analysis, include reference to at least two legislatively-created laws and two judge-decided cases (*i.e.* case law) implicating Darwin, evolution, creationism, or intelligent design.

VC 2) Referencing the *Scopes* litigation, Nicholas Murray Butler, then-president of Columbia University, observed: "The notion that a majority must have its way, whether in matters of opinion or in matters of personal conduct, is as pestilent and anti-democratic a notion as can possibly be conceived."

Considering what you have learned about societal reactions to Darwin and evolution science, including government conduct, provide your assessment of "majority rule" and "minority rights". Are there proper limits to majority rule and, if so, what are they? What are minority rights, and when should they be given priority over the majority's contradictory views?

In providing your assessment, identify at least two instances of "majority rule" implicating Darwin, evolution, creationism, or intelligent design that was challenged, and describe whether the outcome of the challenge respected "minority rights".

Consider evolution education court cases and do one of the following:

VC3) Read two books that discuss the Dover, PA case from various perspectives (Lebo, L. (2008) *The Devil in Dover*. NY: The New Press; Humes, E. (2007) *Monkey Girl*. NY: Harper Collins) or

VC4) Read one of the Dover, PA books and compare and contrast it with a report of the Scopes Trial from a source like Ginger, R (1958). *Six Days or Forever*. Chicago: Quadrangle Books or Larson, E. J. (1997). *Summer for the Gods*. New York: Basic Books) or

VC5) Read one of the secondary accounts of the Scopes Trial (above) and contrast it with the first-hand account provided by Scopes himself in Scopes, J.T. and Presley, J. (1967). *Center of the Storm: The Memoirs of John T. Scopes*. NY: Holt, Rinehart and Winston.

Delezene, L. and Terhune, C.

DT1) Essentialism and Teleology are philosophical principles strongly associated with Plato and Aristotle. With Teleology's focus on apparent design in nature and Essentialism's focus on ideal forms and discontinuities between species and its lack of emphasis on variation between individuals, the dominance of these concepts among preDarwinian thinkers has been argued to have been an impediment to the development of a theory of biological evolution. How were these Greek philosophical traditions adopted by Christian Natural Theologians, like Paley, and systematists of Nature, like Linnaeus? How are Darwin's hypotheses of biological evolution (descent with modification) via natural selection and the multiplication of species inconsistent with Essentialism and Teleology? How did Darwin's emphasis on heritable variation observed between individuals represent a radical departure from the emphasis of Essentialism?

DT2) In the early 1800s Georges Cuvier and Etienne Geoffroy Saint-Hilaire famously debated the roles of form and function in evolutionary biology. Describe this debate and link this debate to Darwin's theory of natural selection and writings. What were the implications of this debate and the work by Cuvier and Geoffroy on the development of modern evolutionary theory?

Etges, Bill

BE1) Explain how and when the theory of natural selection would have been presented if Darwin did not exist. Was its acceptance mostly due to his influence or is natural selection a logical outcome of science?

BE2) Once Mendelian genetics was "rediscovered" in 1903, describe how studying genetic determinism produced both good and bad avenues for scientific research.

BE3) Explain why the theory of natural selection espoused by Darwin is considered a scientific revolution. As part of your response, be sure to cite pertinent references that provide a definition of "scientific revolution." (Hint: Consider the work of Thomas Kuhn in crafting your definition of such revolutions.)

Jolliffe, David

DJ1) In consultation with Professor Jolliffe, select three poems by one of the following Victorian poets: Matthew Arnold, Alfred Tennyson, Robert Browning, Thomas Hardy, George Meredith, Eliza Cook, Caroline Norton. Based on close readings of these poems and on consultation of critical sources, develop a thesis that argues how these three poems make points about one of the following themes: the decay of religious faith in 19th-century England and possible "replacements" for it; the influence of science, in particular evolutionary theory, on Victorian culture; the struggles of the Victorian working class.

Kennefick, Dan

DK1) Darwin and Copernicus proposed theories which not only overthrew established notions of humanity's place in the Universe but also posed challenges for existing theories of physics. Discuss the ways in which physicist's reacted to Darwin's ideas and the discoveries in physics which overcame difficulties in the scientific reception of evolution.

DK2) Discuss how George Darwin's work as an astronomer impacted reception of his illustrious father's theory of Evolution.

DK3) Physics has often figured strongly in debates over the theory of evolution. Discuss various ways in which this has been the case, from Darwin's time to the present day. In particular, discuss how physics has been used to argue both for and against evolution, and ways in which mistaken ideas about physics have been used in these arguments.

DK4) Charles Darwin is one of those rare scientific figures so influential and famous that his personal papers are being treated as one would the papers of leading statesman or ruler. Discuss some of the historiographical issues in dealing with manuscripts (such as private letters) written over a century ago and making them available to be read by the general public today. What other scientists' papers are maintained and studies in a similar fashion?

DK5) To what extent was Darwin's theory a revolution in 19th century biology? Can we still appreciate the paradigm of pre-Darwinian ideas about the origins and development of life? How does the historian piece together the context within which Darwin did his work?

DK6) How did Darwin's theory of evolution impact and was informed by other scientific disciplines, such as Physics, and the ways in which the different views on the age of the Earth were ultimately reconciled in a modern synthesis of the Earth's history.

Lyons, Jack

JL1) Assess Behe's argument for intelligent design. Think about the following: is it a positive argument for design, or merely a negative argument against standard neo-Darwinian evolutionary theory? What if it were? How empirical or scientific (are these the same thing?) is the argument? How successful is the argument?

JL2) Gould argues that science and religion have separate domains of authority. Dawkins argues that religion doesn't have the kind of authority Gould claims it does. Engage with this debate.

JL3) Suppose that the generally received views about biological evolution are all true. What room does that leave for God? For religion? Address some of the additional questions that arise from this: e.g., could a God worth caring about use competition, death, suffering, and extinction to a means to some worthwhile end? Why would He? Does evolution show that humans are less important than we think we are? Etc.

Maxwell, Angie

AM1) Based on their performances in the Scopes Trial, how did William Jennings Bryan and Clarence Darrow tap into the political/cultural anxieties of southern society during this period. Describe two political/cultural anxieties that each tapped into (4 total) and give an example from your reading to support each (4 specific examples total).

You must cite from at least three of the following four readings.

- Weblink: "The Enactment of Tennessee's Anti-Evolution Law" by Kenneth K. Bailey in *Journal of Southern History* Vol. 16 (November 1950): 472-490. (See Blackboard)

- Weblink: "The Scopes trial and Southern fundamentalism in black and white: race, region, and religion by Jeffrey P. Moran in *Journal of Southern History* Vol. 70 (February 2004): 95-120.

- Weblink: "The Scopes Trial and the Evolving Concept of Freedom." by Edward J. Larson in *Virginia Law Review* (1999). (See Blackboard)

- From Electronic Reserves: "The Scopes Trial in History and Legend" by Edward J. Larson in *When Science and Christianity Meet*, edited by David C. Lindberg and Ronald L. Numbers.

AM2) Complete a 3000-word analysis of a landmark Supreme Court Case that impacted and continues to impact science education in the United States. Additionally, students will analyze at least 2 modern cases (1980-forward) that cited their primary case in an effort to explain the ongoing impact of such decisions.

Required Components for AM2:

1. A detailed analysis of the selected primary case. This should include a concise summary of the case facts, as well as a summary of the arguments made by each side, as well as all opinions (including dissenting and concurrent) issues by the court. Students should use Findlaw.com as a source for this information. The use of online sources, such as Wikipedia, and infoplease.com is prohibited. Students should cite the case document only.
2. A contextual summary. This should include a description of the political climate surrounding the selected case Students need at least four non-internet sources for this section of the paper. Citations with page numbers are required.
3. A detailed analysis of the grounds on which the case was decided (definitions/influence of emerging social movements/precedent, etc.). Students must choose three such factors to discuss in their analysis of the case. These factors should be clearly discussed in the opinions issued by the court. Students need at least three non-internet sources to support their analysis (one source at least per issue).
4. A detailed analysis of two secondary and contemporary cases (post 1980) that cite/reference your primary case. Findlaw.com can steer you in the right direction. The original text of these sources should be cited.

McComas, William

WM1) Consider the range of influences on Darwin (his family, teachers, environment, personal history, etc) and make an argument for which were most important with regards to these three influences a) his development of the theory of evolution by natural selection, b) his apparent reluctance to publish his ideas regarding natural selection and c) the way in which he dealt with the challenge provided by the receipt of the letter from Alfred Russel Wallace. Feel free to write more about just one of these three issues if you believe that would be more effective and revealing

WM2) The proposal for natural selection by Darwin and Wallace is a striking example of parallel discovery in science. Provide a brief overview of the similarities and differences between their two versions of natural selection and discuss at least four other similar examples of ideas in the history of science of parallel discovery.

WM3) Conduct a survey of your fellow students here on campus (with a sample size of at least

100) asking questions about what they know about the science of evolution and Darwin. My suggestion is that you would first conduct a few (<15) interviews and from those interviews craft a survey to capture information from a wider range of folks. Be sure to include some demographic information (science major, gender, expressed interest and/or belief in evolution) and then report what you have found regarding the accurate, inaccurate or just confused understanding of evolution and Darwin.

WM4) Find three recent creationist/anti-evolution/intelligent design books (like S.C. Meyer's *Darwin's Doubt*) and perhaps a tract like *Stones and Bones* by Carl Wieland (included with our readings) and produce an outline of the major arguments made in these books in support of the anti-evolution thesis. Do the authors cite the same arguments? Have the authors provided convincing evidence in support of their theses?

WM5) Consider the range of objections to evolution and reflect on the nature of science and defend or reject the idea that we should teach alternatives to evolution in science class. Isn't it true that we want students to think for themselves and form their own opinions? Please examine the literature from places like the National Center for Science Education, the National Science Teachers Association and the American Association for the Advancement of Science.

WM6) Read one of the accounts of the Scopes Trial from a source like Larson, E. J. (1997). *Summer for the Gods*. New York: Basic Books and contrast it with a revisionist account like Olasky, M. and Perry, J (2005) *Monkey Business: The True Story of the Scopes Trial*. Nashville: Broadman and Holman.

WM7) Consider the Voyage of the Beagle and propose a list of at least five things that Darwin saw, experienced, thought about on the voyage that eventually led to "evolution by natural selection."

WM8) Consider earlier views of evolution and its mechanism (specifically those of E. Darwin, Robert Chambers the writer of Vestiges of Natural Creation, J. Lamarck and Buffon) and contrast them with those of Charles Darwin.

WM9) For you film buffs, you could watch the classic Inherit the Wind (I have a copy you can borrow) and compare and contrast the fictionalized account with an actual account of the Scopes Trial. For backround on the actual trial you should read/skim *Summer for the Gods by Larson* and/or *The Great Monkey* Trial by DeCamp.

Plavcan, Mike

MP1) "The missing link"' is one of the most famous "holy grails" of science. Paleoathropologists now view the term as meaningless, because we have many fossils of human ancestors. At the same time, the term implies a linear view of human evolution from an ape to modern humans. How has the fossil record both answered the question about the search for the "missing link" and at the same time changed our view of human evolution?

MP2) Paleoanthropologists have uncovered the fossil remains of numerous "hominins" or close relatives of modern humans, including several species falling in our own genus Homo. Some of these species lived at the same time as each other. How does the finding of multiple species of Homo living together alter or challenge commonly held views of humanity as unique in nature?

Sonn, Richard

RS1) How did Social Darwinism reinforce prevailing late 19th c. prejudices to become, arguably, the dominant ideology in Europe and America between 1870 and 1940? Should Charles Darwin be held responsible for Social Darwinism?

RS2) Eugenics was discredited after the Nazis appropriated it, yet like Social Darwinism it also had very broad appeal from the 1880s to World War II. Why did it appeal to progressives and even to anarchists on the far left, as well as ultra-nationalists on the far right?

RS3) Compare and contrast eugenics practices in two or more countries, taking into account relevant political influences.

Ward, Barry

BW1) Discuss and evaluate the adequacy of any criteria that have been used to distinguish legitimate science from non-science in legal proceedings or legislation concerning evolution and/or the teaching of biology (either in material drawn from this course, or elsewhere).

BW2) Compare and contrast prediction and explanation. Using examples of putative biological explanations, discuss whether there is a difference between retroactive explanation of a phenomenon and merely accommodating one's theory to the data.

BW3) What is the relevance (necessity/advantage) for understanding the demarcation of science from non-science for the average person? Focus on those elements that permit such demarcation, give examples of the issue of relevance and discuss how evolution fits into all of this.

Appendix B: Instructor Biographies for *The Darwin Course*:

Vince Chadick (vchadick@bassettlawfirm.com)is a partner in Bassett Law Firm LLP and maintains a commercial law practice. The emphasis of Mr. Chadick's work is representing and consulting business concerns, including agribusinesses, especially in the context of civil litigation. Mr. Chadick graduated (J.D.) from the University of Arkansas School of Law in 1993. He graduated from Georgetown University (A.B.) in 1991. Mr. Chadick also has a Master of Laws degree from the University of Arkansas School of Law Graduate Program. He is a member of the Bars of Arkansas and Oklahoma. Mr. Chadick sits on appointment by the Supreme Court of Arkansas to serve on the Arkansas Civil Practice Committee, and he is also a member of the Board of Directors of the Eighth Circuit Bar Association. In complement to his private law practice, Mr. Chadick is an adjunct lecturer of law in the University of Arkansas School of Law.

Lucas Delezene (delezene@uark.edu) received his PhD from Arizona State University and is an Assistant Professor in the Department of Anthropology. He researches the evolution of the human and primate dentition. His research ranges from working with original human fossils to describe patterns of anatomical change over time within extinct species, to using dental anatomy to delineate fossil species, to reconstructing patterns of tooth use, and to using evolutionary developmental models to reconstruct patterns of natural selection that have driven human evolution. To provide context for patterns observed in the human fossil record, he uses living primates as models. His research has taken him around the world to work with fossils and natural history collections; for example, he has participated in paleontological and archaeological fieldwork relevant to human origins in South Africa, Ethiopia, and Spain. He has also conducted paleontological fieldwork in the American Southwest searching for the ancestors of mammals.

William (Bill) Etges (wetges@uark.edu)received his Ph.D. in Biology from the University of Rochester in 1984 and was an NSF Postdoctoral Fellow from 1985-1987. His group of students and scientists are most interested in how biodiversity originates using a variety of approaches to understand adaptation and speciation. A majority of his work involves study of the relationships between desert *Drosophila* and their host plants due to the wealth of previous knowledge of this fascinating system. His academic interests are evolutionary genetics, ecological genomics, natural and sexual selection in the wild, speciation, cuticular hydrocarbon chemistry and evolution.

David Jolliffe (djollif@uark.edu) is professor of English where he is the initial occupant of the Brown Chair in English Literacy beginning in 2005) with a mission to promote critical and effective literacy among Arkansans in all walks of life. He earned a B.A. in English from Bethany College; an M.A. in English from West Virginia University in 1980; and a Ph.D. in English from the University of Texas in 1984. Jolliffe began his career as an educator at Triadelphia High School and then at Wheeling Park High School, where he taught both English and theatre. Jolliffe has also taught at West Virginia University, Bethany, the University of Texas, the University of Illinois at Chicago, and DePaul University. He is the author or editor of 13 books and more than 40 articles on the history and theory of rhetoric, the teaching of writing, and the preparation of writing teachers, Jolliffe has always connected his work to the arts, particularly to theatre. Jolliffe's interest in 19th century British literature and history was kindled during his time as a master's student at West Virginia University, where he had the good fortune to study with Professor John Stasny, the editor of *Victorian Poetry,* the preeminent scholarly journal in the field. Several years later, Jolliffe was a founding member of the Rhetoric and Christian Tradition Special Interest Group in the Conference on College Composition and Communication.

Dan Kennefick (danielk@uark.edu)earned the B.Sc. Physics, University College Cork, National University of Ireland in 1987 and the Ph.D. in 1997 at Caltech. He was a Research Associate, Cardiff University, Wales, 1997-2000, Senior Research Fellow, Caltech 2001-2004, Visiting Assistant Professor, Department of Physics, University of Arkansas, 2004-2009, Assistant Professor, 2009-present. Dr. Kennefick's research interests include the astrophysics of supermassive black holes (in particular their mass function) and their role in galactic evolution, theoretical modeling of gravitational waves from binary black hole systems (especially those with extreme mass ratios) and the history of relativity theory and astronomy. He also contributes to editing the Collected Papers of Albert Einstein and to the AGES collaboration.

Jack Lyons (jclyons@uark.edu)received his PhD from Arizona and is a Professor of Philosophy. He works mainly in epistemology, cognitive science, and philosophy of mind. Much of his current work has involved the epistemology of perception. He recent book for Oxford University Press is titled *Perception and Basic Beliefs*; also, he is an associate editor for the journal *Episteme: A Journal of Individual and Social Epistemology*.

Angie Maxwell (amax@uark.edu) (Ph.D. American Studies, University of Texas, Austin) is the Diane D. Blair Professor of Southern Studies and an Assistant Professor of Political Science at the University of Arkansas. She is the co-editor of *Unlocking V. O. Key, Jr.: Southern Politics for the Twenty-first Century* (University of Arkansas Press, 2011) and *The Ongoing Burden of Southern History: Politics and Identity in the Twenty-first Century South* (Louisiana State University Press, 2012), and the editor of the new edition of Ralph McGill's *A Church, A School* (University of South Carolina Press, 2012) Her articles have appeared in *Presidential Studies Quarterly*, the *Journal of Black Studies*, *Social Science Quarterly*, and *The Southern Quarterly*. Her book, *The Indicted South: Public Criticism, Southern Inferiority, and the Politics of Whiteness,* is forthcoming in April from the University of North Carolina Press. She is co-founder of the Blair Center-Clinton School Poll, an election year survey that reveals national and regional voting behavior and preferences.

William (Bill) McComas (mccomas@uark.edu) joined the faculty of the University of Arkansas College of Education and Health Professions in 2006 as the inaugural holder of the Parks Family Endowed Professorship in Science Education. This position follows more than a decade of service as a professor at the University of Southern California where he founded PASE, the Program to Advance Science Education. He worked for many years as a middle level and secondary science teacher in suburban Philadelphia before completing the doctorate in science education from the University of Iowa. McComas is interested in the improvement of laboratory instruction, effective evolution education, the interaction of the philosophy of science and science teaching, science education for gifted students, and science instruction in museums and at field sites.

Joseph (Mike) Plavcan mplavcan@uark.edu)received a B.A. in anthropology and zoology in 1984 from Duke University and a Ph.D. in biological anthropology and anatomy from Duke University in 1990. He received an NIH-

funded postdoctoral fellowship in the Department of Biology at the University of Cincinnati under Dr. Rebecca German from 1991-1993, studying human fetal craniofacial growth and development. From 1993 until 2001 he taught Human Gross Anatomy at the New York College of Osteopathic Medicine. He joined the Department of Anthropology in the fall of 2001. Dr. Plavcan's research centers on primate and human evolution, with an emphasis on using comparative analyses of living species to understand the morphology and adaptations of extinct species. He is best known for his work on sexual dimorphism in primates and humans, which involves comparative work using both anatomical and behavioral/ecological data. He is currently a co-director of the West Turkana Paleontology Project in Kenya, carrying out paleontological field work at Kanapoi and other sites in Kenya, focusing on early hominin evolution.

Richard Sonn (rsonn@uark.edu) received his PhD from the University of California, Berkeley, and is a professor in the Dept. of History. He is interested in Darwin and evolution as a European intellectual historian and also as someone who has participated in the history of science reading group since its inception. In researching his last book on French anarchists in the 1920s, he discovered to his surprise that some of the anarchists he was studying were into eugenics, and in particular in negative eugenics. Social Darwinism was one of the dominant ideologies of the 1870-1940 era, so both eugenics and Social Darwinism were extremely influential ideologies and pseudo-scientific practices. His current research involves the same period but a very different topic: immigrant Jewish artists in the Parisian artists' colony of Montparnasse from 1905 to 1940.

Claire Terhune (cterhune@uark.edu) received her PHD in anthropology from Arizona State University 2010, and she joined the Department of Anthropology at the University of Arkansas in January 2014. Dr. Terhune's research interests are focused in three areas: 1) understanding the evolution and function of primate, modern human, and fossil hominin skull shape; 2) developing and advancing techniques for comparative morphometric analysis and visualization; and 3) evaluating models of hominin migration(s) into Europe and Asia during the early Pleistocene. Not only has Dr. Terhune worked in museum collections throughout North America and Europe, she has also worked extensively as an archaeologist in Arizona, excavated dinosaur remains in northern Mexico, worked on Paleolithic sites in France and Spain, done bioarchaeological fieldwork on the island of Cyprus, worked at the paleoanthropological locality of Hadar in Ethiopia, and observed howler monkeys in Costa Rica.

Barry Ward (bmward@uark.edu) received his PhD from Rutgers and is an Associate Professor of philosophy with primary interests in philosophy of science, metaphysics, and philosophy of physics. His work in metaphysics and the philosophy of science overlap in dealing with laws, objective probabilities, and their intimate connections with scientific explanation. He has a Master's degree in theoretical physics from Trinity College, Dublin. His philosophy-of-physics interests include the Measurement Problem in Quantum Mechanics and the philosophy of time.

APPENDIX C
Policies Governing this Class

I) Instructor's Policies

A) Grading Scale: Presently, we are not permitted to award "+" and "-" grades. This is unfortunate because there is certainly a difference between the achievement of those earning 80% and those earning 89% but in the current system both would be a "B." So, in order to award a more meaningful grade with some precision, we will use a 9 point scale in this class whereby 91% will be the lowest A, 82% the lowest 8, 73% the lowest C and 64% the lowest D.

B) Syllabus Disclaimer: This syllabus is a starting guide to planned class activities. Changes may occur to meet class needs as determined by the professor but every attempt will be made to abide by the current syllabus.

C) Lateness: To encourage everyone to hand in all assignments, we will accept late work. However, in fairness to those who turn assignments in on time there will be a price to pay. All assignments will be reduced by at least one letter grade for each week (or part of a week) of lateness.

D) Digital and Electronic Device Policy: You may use devices such as laptop computers, tablets and other such tools in class. They are useful for note taking (of course) and for immediate fact-checking (yes, professors do make mistakes). However, you will lose this privilege if you engage in non-educative functions such as roaming the internet, checking and receiving emails and engaging in other social media excursions. Please realize that your colleagues in class often see what others are doing and have regularly reported being distracted by these sorts of off-task digital behaviors.

II) University Policies and Procedures

A) The Grade of Incomplete (IN) can be assigned only when work is not completed because of a documented illness or some other emergency occurring after the 12th week of the semester. Students must not assume that the instructor will agree to the grade of IN. Removal of the "IN" must be instituted by the student, agreed to by the instructor, and reported on the official "Incomplete Completion Form."

B) Students with Disabilities: University of Arkansas Academic Policy 1520.10 requires that students with disabilities are provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact me privately within two weeks of the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through the Center for Educational Access Room 104 in the Arkansas Union (Contact 479–575–3104 or visit http://cea.uark.edu for more information on registration procedures).

C) Academic Honesty and Integrity Policy: As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the University's 'Academic Integrity Policy' which may be found at http://provost.uark.edu/.

Academic dishonesty is defined by the University of Arkansas Honesty Policy as "Acts which may subvert or compromise the integrity of the educational process at the University of Arkansas. Included is an act by which a student gains or attempts to gain an academic advantage for himself or herself or another by misrepresenting his or her or another's work or by interfering with the completion, submission, or evaluation of work." If I suspect academic dishonesty has occurred, I will act in accordance with the guidelines contained in the Academic Honesty Policy as set in the *2013-2014 University of Arkansas Graduate School Catalog.* Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

D) Emergency Preparedness: Many types of emergencies can occur on campus; instructions for specific emergencies such as severe weather, active shooter, or fire can be found at **emergency.uark.edu**.

Severe Weather (Tornado Warning):

- Follow the directions of the instructor or emergency personnel
- Seek shelter in the basement or interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside
- If you are in a multi-story building, and you cannot get to the lowest floor, pick a hallway in the center of the building
- Stay in the center of the room, away from exterior walls, windows, and doors

Violence / Active Shooter (Think "CADD"):

- **CALL:** 9-1-1
- **AVOID:** If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.
- **DENY:** Barricade the door with desk, chairs, bookcases or any items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it is safe.
- **DEFEND:** Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

E) Inclement Weather Policy: When the University has officially canceled classes because of inclement weather this class will not meet. At other times if you feel the weather is so bad that you would risk an accident to get to class, you are responsible for making your own best decisions in these instances.

For information regarding whether the university is closed for any reason use the following sources:

- See the inclement weather web site at **http://emergency.uark.edu/11272.php**
- Call 479-575-7000 or university switchboard at 575-2000 for recorded announcements about closings
- Check voice mail for announcements
- Listen to KUAF Radio, 91.3 FM, or other local radio and television stations for announcements.

F) Tape-recording and/or any Other Form of Electronic Capturing: Tape-recording and/or any other form of electronic capturing of lectures is expressly forbidden. *State common law and federal copyright law protect my syllabus and lectures. They are my own original expression and I record my lectures at the same time that I deliver them in order to secure protection. Whereas you are authorized to take notes in class thereby creating a derivative work from my lecture, the authorization extends only to making one set of notes for your own personal use and no other use.* ***You are not authorized to record my lectures, to provide your notes to anyone else or to make any commercial use of them without express prior permission from me.***

Persons authorized to take notes for the Center for Educational Access, for the benefit of students registered with the Center, will be permitted to do so, but such use still is limited to personal, non-commercial use. Similarly, you are permitted to reproduce notes for a student in this class who has missed class due to authorized travel, absence due to illness, etc. However, to be clear, any class notes must not be sold or made available for any commercial use.

G) Academic appeals: Students are first encouraged to resolve academic conflicts and complaints informally with the instructor involved, through their department, or through the assistance of the University Ombuds Office, which can provide objective and confidential mediation. To assist students in identifying the appropriate contact person, please view this **List of Program, Department, and College Contacts**. A **flow chart** is also available for viewing. If an informal resolution cannot be reached, there are procedures for students to pursue with complaints of an academic nature. Refer to either the Undergraduate Catalog of Studies (http://catalogofstudies.uark.edu/2882.php) or the Graduate Catalog of Studies (http://catalogofstudies.uark.edu/3909.php) for appeals structures and formal procedures for academic grievances.