

BSC 3402
Theory and Practice in the Biological Science

Professor Vassiliki Betty Smocovitis

Spring 2018

Meeting Time (10:40-12:35 pm) Wednesdays (Periods 4 and 5)

Office Hours: Tuesdays 1:45-3:30 or by appointment

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COURSE DESCRIPTION

This course is intended to introduce students to historical and philosophical perspectives on the doing of biology, becoming a biologist, and to a range of issues that highlight the complex relationship between biology and society. The goals of the course are three-fold: first, we will explore how biological theories are actively made by scientists whose individual and social values can shape their science and how that science can then shape individual and social values. Second, we will explore the practice of science, and how that practice in turn can shape the kind of science that is done. Third, we will examine the interplay of biology and society through some well known controversies in the biological sciences that will ground this discussion; the “race” for the discovery of the structure of DNA will be examined closely. Along with other readings this will allow us to explore the role of gender in science. The course then moves on to more specific topics that concern traditional bioethicists: environmental ethics, animal rights and medical ethics. The course includes a final discussion that draws on some current events and the attempt to legislate science. The course closes by considering the biological worldview of E. O. Wilson as embodied in his synthetic book titled *The Future of Life*.

STRUCTURE OF COURSE AND EVALUATION

This is a two-credit seminar that places heavy emphasis on reading and discussion of assigned material. Students are expected to have completed assigned readings on the date assigned and to bring their insights to the class discussion. Evaluation is based on class participation (including attendance) for a total of 20% of the grade. Students are allowed two legitimate absences only. The remaining 80% is based on eight class assignments called reaction papers (out of a possible ten) due on the day of discussion. These will be given grades of check plus, check, check minus or “U” (or unsatisfactory). Students are strongly encouraged to rewrite their papers immediately after class discussion if they find their views have changed or if they wish to improve their grades. Rewrites must be submitted within one week after the discussion. There is no final exam.

Please note: Any students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

BOOKS

1. Stephen J. Gould, *The Mismeasure of Man*, revised and expanded edition, 1996.
2. James. D. Watson, *The Double Helix*, Norton Critical Edition.
3. Rebecca Skloot, *The Immortal Life of Henrietta Lacks*, Crown Publishers, 2010.
4. Karen F. Grief and Jon F. Merz, *Current Controversies in the Biological Sciences. Case Studies of Policy Challenges from New Technologies*, 2007.
5. E. O. Wilson, *The Future of Life*, 2004

TENTATIVE SCHEDULE OF TOPICS, READINGS, AND ASSIGNMENTS

Week One: Introduction to Course, Readings and the Class.

Week Two:

Historical and Philosophical Perspectives.

Objectivity in the Biological Sciences? A Famous Case Study

Reading: Stephen J. Gould, *The Mismeasure of Man*, revised and expanded edition, 1996, pp. 15-142.

Week Three:

Historical and Philosophical Perspectives.

Objectivity in the Biological Sciences? A Famous Case Study

Reading: Stephen J. Gould, *The Mismeasure of Man*, revised and expanded edition, 1996, pp. 142-425.

Assignment #1 (two-page paper due): According to Stephen J. Gould, how is scientific knowledge made? To what extent is it shaped by social and individual values? How can we guard against injecting those values in science?

Week Four: The Practice of Research, I. Ethics of Authorship and Publication. Case Study: the Discovery of the Structure of the DNA Molecule (Gender and Science)

Reading: James D. Watson, *The Double Helix*, Norton Critical Edition.

Assignment #2 (two- page paper due)

Week Five: II. Ethics of Authorship and Publication

Film and Discussion *The Race for the Double Helix*

Week Six:

The Practice of Research, II. Gender and Race in Science. Case Study: Informed Consent and the Extraordinary Story of HeLa Cells

Reading: Rebecca Skloot's *The Immortal Life of Henrietta Lacks*

Assignment #3 (two-page reaction paper due)

Week Seven:

Biology and Social Concerns: I. Current Controversies in the Biological Sciences (Who Owns the Genome? Manufacturing Children and Stem Cells)

Readings: Chapters 3, and 4 of Greif and Merz

Assignment #4 (two-page reaction paper due)

Week Eight:

Biology and Social Concerns II: Concealing Evidence and the Manufacture of Doubt

Readings: Chapter 8 of Greif and Merz

Film: *Climate of Doubt* (PBS Frontline, on line, and in class viewing)

Assignment #5 (two-page paper due)

Week Nine: Spring Break. No Class.

Week Ten:

Biology and Social Concerns III: Protecting the Public, Cosmetic Science, Selling Science

Readings: Chapters 5, 6, and 7 of Greif and Merz.

Assignment #6 (two-page reaction paper due)

Week Eleven:

Biology and Social Concerns IV: Current Controversies in the Biological Sciences (Science in the National Interest, Science Misunderstood).

Readings: Chapters 9 and 10 of Greif and Merz.

Assignment #7 (two-page reaction paper due)

Week Twelve:

Biology and Social Concerns VI: Current Controversies in the Biological Sciences (Dangers in the Environment, Who Lives? Who Dies?)

Readings: Chapters 11, 12 and Concluding Remarks of Greif and Merz.

Assignment #8 (two-page reaction paper due on the day of discussion)

Week Thirteen: Science and Safety

Film: *Supplements and Safety* (Frontline viewing and discussion in class)

Week Fourteen: Reading Week

Assignment #9: Reaction response to “Science and Safety” (due week after viewing; submit electronically)

Weeks Fifteen and Sixteen:

The Future of Life

Readings: E. O. Wilson, *The Future of Life*

Assignment #10 (two-page reaction paper on E. O. Wilson’s book and film *Racing Extinction* due final week)

GUIDELINES FOR ASSIGNMENTS AND REACTION PAPERS

You are required to write eight class assignments out of the possible ten designated on your syllabus. The goal of the assignment is to encourage students to engage critically the issues raised by the readings assigned, and to come to class prepared to engage in class discussion. I suspect that there will be some similarities in points of view, but each paper will (I hope) reflect the opinions of each reader and author. I cannot therefore give you a fixed set of standards or any formula for writing papers, though I can help refine the goals of the assignment and offer the following as guidelines.

Length: Each paper should be a minimum of 2 double-spaced typewritten pages (regular font or 12 points). You may extend the length of your paper to no longer than 4 pages.

Structure: This paper *is not a review* of the readings or any of the books assigned. Do not attempt to write a full-fledged description of the books. Somewhere in the text, you should, however, summarize the “point” of the book. In other words, try to interpret the book in about one paragraph. This could be in your introduction. Your response or reaction to the

texts should form the main body of the essay. Feel free to ask critical questions in these essays or point to any shortcomings in the readings or books. Keep in mind, however, that "critical" does not necessarily mean a negative assessment, but a rigorous and thoughtful analysis that brings into relief the issues raised by a particular subject.

Style: Please feel free to use the "I" personal form if you so wish; but try to avoid over-personalized responses. The essay should maintain a scholarly tone, but should also avoid pedantic, pretentious academic-eze. Do not overuse the passive voice; this is not a laboratory write-up, but a critical essay.

Suggestions for reading the texts: Please do not engage the readings as you would of standard textbooks in psychology, chemistry, biology, or astronomy. Jot down notes only when necessary; you do not need to highlight the text, although some notation or highlighting may help. Pay close attention to what the author is trying to achieve by reading the background material if it is included (e.g. preface, foreword, introduction etc.). Familiarize yourself with the author by doing additional research if necessary in the library (you may use any of the biographical sources in the science library or on the internet).

Directions:

1. Please hand in papers during class time
2. Always make two copies of any assignments (if you don't do this already, get in the habit now).
3. There is no need for a formal title page for this course (save resources where you can), but you must have your name and a title somewhere on the front page.
4. Staple your pages. Try to use a software program that allows you to write your name on each page.
5. Always number pages.
6. Include a bibliography or reference section if you have relied on additional sources. The formatting is flexible. Be judicious with your reliance on the internet as it is not peer-refereed information.

References/Recommendations

Performance in this class will be reflected in the final grade, which will also appear on the UF official transcripts. If additional research, course-work, or honors theses are undertaken with the instructor, references may be requested.

PLEASE NOTE: Only approved electronic devices may be used in class. Approved electronic devices are laptop computers (when used to take notes or otherwise participate in classroom activities) and voice recording devices. Unapproved electronic devices include cell phones, video recorders, digital cameras and MP3 players.

UF Counseling Services

- Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
 - UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
 - Career Resource Center, Reitz Union, 392-1601, career and job search services.
- Many students experience test anxiety and other stress related problems. "A Self Help Guide for Students" is available through the Counseling Center (301 Peabody Hall, 392-1575) and at their web site: <http://www.counsel.ufl.edu/>.

Honesty Policy

- All students registered at the University of Florida have agreed to comply with the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."
- In addition, on all work submitted for credit the following pledge is either required or implied: *"On my honor I have neither given nor received unauthorized aid in doing this assignment."*
- If you witness any instances of academic dishonesty in this class, please notify the instructor or contact the Student Honor Court (392-1631) or Cheating Hotline (392-6999). For additional information on Academic Honesty, please refer to the University of Florida Academic Honesty Guidelines at: <http://www.dso.ufl.edu/judicial/procedures/academicguide.html>.

Accommodation for Students with Disabilities

- Students who will require a classroom accommodation for a disability must contact the Dean of Students Office of Disability Resources, in Peabody 202 (phone: 352-392-1261). Please see the University of Florida Disability Resources website for more information at: <http://www.dso.ufl.edu/drp/services/>.
- It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. Once notification is complete, the Dean of Students Office of Disability Resources will work with the instructor to accommodate the student.

Software Use

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.