

BSC 3402
Theory and Practice in the Biological Science

Prof. Vassiliki Betty Smocovitis
Fall 2021: Online Zoom Edition, Canvas Platform
Tuesday: Periods 4-5 (10:40-12:35)
Office: 617 Carr Hall
Office Hours Wednesdays 12:00 to 1:00 pm or by appointment or online
Contact: Please use Canvas Tool but also bsmocovi@ufl.edu
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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 in turn 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 include the “race” for the double helix. Additional readings will allow us to explore the role of gender, race and class in the history of science. The course then moves on to more specific topics that concern traditional bioethicists: medical ethics, environmental ethics, and policy. The course closes by considering the future of life on earth. Given the relevancy of the COVID-19 pandemic, discussions will also draw on the many events that will unfold over the course of the semester.

STRUCTURE OF COURSE AND EVALUATION

This is a two-credit on-line seminar that places heavy emphasis on reading and discussion of assigned material. Students are expected to have completed all assigned reading or viewing material before class discussion. Evaluation is based on class participation (including attendance) for a total of 30% of the grade. Students are allowed two legitimate absences only. The remaining 70% is based on seven class assignments called reaction/response 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 expected to have completed assigned readings and to have written their 2-page reaction/response paper by noon on the Monday before our Tuesday class on the topic. If they wish, students may 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. The course follows standard UF grade scales and policies: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

BOOKS

1. Stephen J. Gould, *The Mismeasure of Man*, revised and expanded edition, 1996.
2. James. D. Watson, *The Double Helix*, Norton Critical Edition, 1996.
3. Rebecca Skloot, *The Immortal Life of Henrietta Lacks*, 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. Naomi Oreskes and Erik Conway. *The Merchants of Doubt*. Bloomsbury, 2010.
6. E. O. Wilson, *The Future of Life*, 2002.

TENTATIVE SCHEDULE OF TOPICS, READINGS, AND ASSIGNMENTS

Week One

Introduction to Course, Readings and the Class.

I: Historical and Philosophical Perspectives

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 reaction paper due on Canvas by Monday at noon on *The Mismeasure of Man*):

Directed Essay: 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?

II. The Practice and Ethics of Research

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.

Week Five:

The Practice of Research: II. Ethics of Authorship and Publication

Discussion of Home Viewed Film: *The Race for the Double Helix* (available on)

<https://vimeo.com/179934156>

Assignment #2 (two-page reaction paper due on Canvas by Monday at noon on book and film for *The Double Helix*).

Week Six

The Practice of Research, III. 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* Parts 1 and 2

Week Seven

The Practice of Research, IV. 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* Part 3

Assignment #3 (two-page reaction paper due on Canvas by Monday at noon on *The Immortal Life of Henrietta Lacks*)

III: Biology, Current Controversies, and Policy

Week Eight

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 on chapters on Canvas by Monday at noon)

Week Nine:

Biology and Social Concerns II. Protecting the Public, Cosmetic Science, Selling Science

Readings: Chapters 5, 6, and 7 of Greif and Merz; film on supplements and safety seen last week

Assignment #5 (two-page reaction paper due on chapters on Canvas by Monday at noon)

Week Ten:

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

Readings: Chapter 8 of Greif and Merz; *The Merchants of Doubt*

Film: *Climate of Doubt* (PBS Frontline) available here:

<https://www.pbs.org/wgbh/frontline/film/climate-of-doubt/>

Assignment #6 (two-page reaction paper due on chapters, PBS Frontline and *The Merchants of Doubt* by Monday at noon)

Week Eleven:

Biology and Social Concerns IV: Current Controversies in the Biological Sciences (Science in the National Interest: Science Misunderstood; Dangers in the Environment; Who Lives, Who Dies?).

Readings: Chapters 9, 10, 11 and 12 of Greif and Merz.

Assignment #8 (two-page reaction paper due on chapters on Canvas by Monday at noon)

Week Twelve:

Biology and Social Concerns V: The Pandemic (TBA: Reading to follow events)

Assignment #9 (two-page reaction paper due on Canvas by Monday at noon)

III: Biology and the Future of Life

Week Thirteen

Climate Change and Pandemics: Biodiversity Loss and Its Consequences

Film: *Racing Extinction* and Discussion

Week Fourteen

Reading: E.O Wilson. *The Future of Life*

Assignment #10 (two-page reaction paper due on Canvas by Monday at noon on both *Racing Extinction* and the *Future of Life*)

Week Fifteen

Our Present Predicament

Discussion and Conclusions

GUIDELINES FOR ASSIGNMENTS AND REACTION PAPERS

You are required to write seven 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 3 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).

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.

POLICIES

Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Your voice matters. Thank you for serving as a partner in this important effort.

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 with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center: <https://disability.ufl.edu/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

UF Counseling Services

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

UF Official Statement on COVID-19

In response to COVID-19, the following practices are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to further the health and safety of ourselves, our neighbors, and our loved ones.

- If you are not vaccinated, get vaccinated. Vaccines are readily available at no cost and have been demonstrated to be safe and effective against the COVID-19 virus. Visit this link for details on where to get your shot, including options that do not require an

appointment: <https://coronavirus.ufhealth.org/vaccinations/vaccine-availability/>. Students who receive the first dose of the vaccine somewhere off-campus and/or outside of Gainesville can still receive their second dose on campus.

- You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated. Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.
 - Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
 - Hand sanitizing stations will be located in every classroom.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus. UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the [UF Health Screen, Test & Protect website](#) for more information.
 - Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work.
 - If you are withheld from campus by the Department of Health through Screen, Test & Protect you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- Continue to regularly visit coronavirus.UFHealth.org and coronavirus.ufl.edu for up-to-date information about COVID-19 and vaccination.

Class Policy on Zoom Discussions

- **Class session will be audio-visually recorded for students in the class to refer back to, or for enrolled students who are unable to attend live. Students who participate with their camera engaged or who utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who unmute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the “chat” feature, which allows students to type questions and comments live. The chat will not be recorded or shared.**

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.

Academic Resources

Students are encouraged to make use of the following helpful resources on campus:

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420.

General study skills and tutoring: Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information. On-Line Students Complaints: View the Distance Learning Student Complaint Process.