

HUM 2593: Science in Cultural Context
Fall 2022, T-Th 11-12:15, Online

Instructor: Benjamin Goldberg
Email: big@usf.edu

Office: via Zoom/Teams
Office Hours: By appointment

University Course Description

Science—howsoever we understand that term—is a dominant force in modern society, a source of authoritative knowledge about the world. It is therefore essential to understand how science works, its history, and its limits, as well as to imagine new modes of interaction between science and the culture in which it operates.

This course is designed to give humanities and cultural studies majors an introduction to science studies and the history and philosophy of science, in order to provide a deeper understanding of the complicated ways in which science and the cultures in which it is embedded interact and shape each other. It is also intended to provide a general education credit in humanities to enable students in science, technology, engineering, and medicine to fulfill their requirements by thinking historically and critically about the cultural contexts of scientific knowledge and its production.

General Education Statement

This course is part of the University of South Florida's General Education Curriculum. It is certified for Human & Cultural Diversity. Students enrolled in this course will be asked to participate in the USF General Education assessment effort. This will involve submitting copies of writing assignments for review via Canvas.

Course Purpose

This course is meant to demonstrate to students the complexity of science by examining both the historical development of science, as well as looking at one specific issue in depth. In particular, this course will teach students to critical analyze and understand scientific claims from historical, cultural, religious, and other viewpoints. The course is divided into two parts. The first part will concern the historical context of the development and construction of the very idea of science during the seventeenth and eighteenth centuries. In this section we shall explore not just the development of those practices we now label science, but the ways in which the work of historians and others looking back on this period played a part in constructing our current conception of science and its place in society.

The second part shall build on the work done in the first by looking at these issues in the context of current scientific practices. Here we shall study both philosophical models of science used in discussions of science and culture, as well as the background assumptions and concepts upon which these models are built, as well as the way in which values affect scientific reasoning and practice. We shall focus our efforts in particular on the history of the science of gender differences, as this case study will provide an excellent opportunity to discuss and understand how science is affected by values and assumptions, and how society is, in turn, affected by the results of scientific work.

Topics that will be covered include the following:

- The history of science in early modern Europe
- The philosophy of science and science studies
- The role of gender in science, and the science of gender
- Cultural contexts and their influence on scientific knowledge production

Course Objectives

This is a reading-intensive course! You will be required to read from 20- 50 pages in a week, depending on the density of the material and the topic at hand. Make sure to read the text slowly and carefully. I recommend reading with a pencil and underlining the material you deem to be important/placing notes and questions in the margins so you can bring them to class. Bring the assigned readings to class. You will very likely need to read the assignment more than once to grasp it fully.

- Students will be introduced to science studies and the history and philosophy of science
- Students will encounter a wide range of texts considering the nature and meaning of science as it occurs in various cultural contexts, ranging from early modern Europe to contemporary scientific issues such as climate science
- Students will consider the place and role of religion, social status, and politics in the production of scientific knowledge
- Students will learn about the place of values in scientific practice and in the construction of scientific knowledge claims

Student Learning Outcomes

- Students will use research and indicators of authority to determine the credibility of sources, while identifying any legal and ethical restrictions placed on the use of information (**SLO 1 = Information and Data Literacy**).
- Students will critically compare and contrast opposing claims regarding the same fact or hypothesis, when the various sides are credible according to discipline-specific indicators of authority, demonstrating the ability to read texts closely and critically, and to identify the appropriate cultural, religious, political, and historical contexts for analysis (**SLO 2 = Critical and Analytical Thinking**).
- Students will be able to critically analyze the nature of science as it was constructed in the early modern period and understand the context out of which scientific and philosophical problems were understood and addressed (**SLO 3 = Problem Solving**).

Information and Data Literacy:

This course will help students understand the difference between primary and secondary sources, focusing on cases from the history of science, and will teach them to be able to determine when and how to search for information and information sources, as well as to evaluate and critically compare such sources, allowing students to use and share information to understand the issues at hand, and to solve all relevant problems asked of them effectively and responsibly.

Critical and Analytical Thinking:

This course is specifically designed to present case studies from the history of science, in cultural context, so as to train students in the critical analysis of such case studies. We will focus on, in

particular, on understanding the historical and other contextual circumstances of the Scientific Revolution, as well as a critical and deep look at the psychological and biological research on the nature of gender and sex. In addition, students will be required to reflect on the nature, extent, and justification of scientific knowledge, demonstrating in their writing a growing capacity to critically distinguish science from other forms of human activity; good science from bad; and scientific claims warranted by available evidence from those for which such evidence remains outstanding.

Problem Solving:

Students will study the contexts within which historical scientists have identified and addressed scientific problems spanning from the early modern period to today, and the ways in which such contexts have both enabled and constrained the search for and validation of appropriate methods for their solution. Thus prepared, students will be better able to gain critical distance from the contexts of their own enquiries, understanding the advantages and disadvantages those contexts confer.

Required Texts & Materials

- Shapin, Steven (1998), *The Scientific Revolution*, University of Chicago Press ([SHAPIN](#))
- Fausto-Sterling, Anne (2012), *Sex/Gender: Biology in a Social World*, Taylor and Francis ([AFS](#))
- All other readings will be made available either online through Canvas ([PDF](#))

Assignments & Basis for Final Grade

Assignment for Unit 1 (GEA Assignment 1): 35% of Final Grade

Due through Canvas on T 10/25 before midnight

The first writing assignment is a paper no longer than 8 pages. The task for this paper is to reflect on the meaning of science during the early modern period, making sure to use primary sources in a critical and reflective way. (*SLOs 1-3*).

First, offer a definition of science in this period, making sure to pick out at least three important characteristics of scientific activity under your definition. Think about various aspects of science, including, what problems are being solved by this activity? What problems are being ignored? What kinds of contextual factors affect these activities?

Second, support your definition with at least two examples from primary sources, showing how they fit your understanding of science. Further, students must inform their discussion through the use of secondary sources, making sure to note and discuss any conflicts or differences in evaluation concerning the primary sources. Make sure to discuss potential problems with your definition, and outline one or more strategies to deal with these problems.

Finally, in the last section, briefly compare your understanding of early modern science with modern scientific activity, discussing at least one difference and one similarity. Make sure to discuss the problems solved by each kind of science, noting how they achieve their goals, and, at the end, make an evaluation of which kind of science is better at achieving their goals. That is, what problems is science solving (within the domain of science, within society, and etc.)? Is there anything modern science can learn from historical science, or are the problems and issues they address too different?

Assignment for Unit 2 (GEA Assignment 2): 35% of Final Grade

Due through Canvas on T 12/6 before midnight

The second writing assignment is a paper no longer than 8 pages. The task for this paper is to use the readings from the class to answer each of following questions. Remember to always use examples and quotes from the readings to support your arguments! Secondary sources beyond those assigned in class are HIGHLY RECOMMENDED but not strictly required. (SLOs 1-3).

Question 1: Is science and/or rationality gendered? What could it mean to make such claims, and how could they be justified? How can we resolve debates about these issues?

Question 2: What should a feminist conception of science look like? Can feminism make science *better*? Can feminism solve some problems but not others? Are there multiple ways to solve these problems? What kinds of conflicts or other problems might arise from feminist ideas about science? Make sure to define your terms and use relevant and trustworthy sources to back up your claims.

Question 3: Is the science of sexuality and gender epistemologically respectable? Why or why not? What problems does this science present? What solutions might it contain? Make sure use relevant and trustworthy sources to back up your claims.

First Day Attendance: 10% of Final Grade

There is a discussion board found on the Canvas course page called ‘FDA and Learner Introductions’. Please comment in this discussion with the following information: your name, your place of birth, your major (or presumptive major if you have not yet declared), and your favorite movie.

Class Participation: 20% of Final Grade

Students will be required to attend class (barring emergencies, health issues, and other legitimate excuses), as well as participate in various in class activities and discussions.

Feedback & Process Writing: Students will receive extensive written comments on each writing assignment and will be expected to address those comments in subsequent writing assignments. The format of written comments will include comments via Canvas, as well as one on one meetings with the professor to discuss writing. In addition, the USF standardized rubrics for SLOs 1-3 (attached to this syllabus) will be used as a partial basis for evaluation, and their inclusion below is meant to help students understand how they are being evaluated.

Grading Scale (%)			
94-100	A	74-76	C
90-93	A-	70-73	C-
87-89	B+	67-69	D+
84-86	B	64-66	D
80-83	B-	60-63	D-
77-79	C+	0 - 59	F

Grade Dissemination: Graded tests and materials in this course will be returned individually only by request. You can access your scores at any time using "Grades" in Canvas.

Course Policies: Grades

Late Work Policy: Late work will only be accepted on a case-by-case basis. You must have a legitimate excuse (injury, major life event, etc.).

Extra Credit Policy: Extra credit will not be offered.

Grades of "Incomplete": The current university policy concerning incomplete grades will be followed in this course. For USF Tampa undergraduate courses and USFSM undergraduate and graduate courses: An "I" grade may be awarded to a student only when a small portion of the student's work is incomplete and only when the student is otherwise earning a passing grade. The time limit for removing the "I" is to be set by the instructor of the course. For undergraduate students, this time limit may not exceed two academic semesters, whether or not the student is in residence, and/or graduation, whichever comes first. For graduate students, this time limit may not exceed one academic semester. "I" grades not removed by the end of the time limit will be changed to "IF" or "IU," whichever is appropriate.

Rewrite Policy: Rewrites will not be offered except in extraordinary circumstances.

Essay Commentary Policy: All students are encouraged to submit their work to the professor prior to turning it in for grading, and each student will be allowed to have a full draft of each of the two papers read and commented upon. In order to take advantage of this, students must provide the draft to the instructor no later than 3-4 days prior to the due date of the paper.

Group Work Policy: Group work is only acceptable on in class assignments that are specifically described as group assignments.

Course Policies: Technology and Media

Email: Please use email via Canvas or via big@usf.edu – this is the best way to reach me!

Canvas: This course will be offered via USF's learning management system (LMS), Canvas. If you need help learning how to perform various tasks related to this course or other courses being offered in Canvas, please view the following videos or consult the Canvas help guides. You may also contact USF's IT department at (813) 974-1222 or help@usf.edu.

Laptop Usage (including tablets) Laptops are allowed but be respectful.

Classroom Devices (including phones): Please leave your devices off or in silent mode. Students disruptively using their devices will be asked to leave.

Course Policies: Student Expectations

Academic Integrity of Students: Academic integrity is the foundation of the University of South Florida System's commitment to the academic honesty and personal integrity of its university community. Academic integrity is grounded in certain fundamental values, which include honesty,

respect, and fairness. Broadly defined, academic honesty is the completion of all academic endeavors and claims of scholarly knowledge as representative of one's own efforts. The final decision on an academic integrity violation and related academic sanction at any USF System institution shall affect and be applied to the academic status of the student throughout the USF System, unless otherwise determined by the independently accredited institution.

Disruption to Academic Process: Disruptive students in the academic setting hinder the educational process. Disruption of the academic process is defined as the act, words, or general conduct of a student in a classroom or other academic environment which in the reasonable estimation of the instructor: (a) directs attention away from the academic matters at hand, such as noisy distractions, persistent, disrespectful, or abusive interruption of lecture, exam, academic discussion, or general University operations, or (b) presents a danger to the health, safety, or well-being of self or other persons.

Student Academic Grievance Procedures: The purpose of these procedures is to provide all undergraduate and graduate students taking courses within the University of South Florida System an opportunity for objective review of facts and events pertinent to the cause of the academic grievance. An "academic grievance" is a claim that a specific academic decision or action that affects that student's academic record or status has violated published policies and procedures or has been applied to the grievant in a manner different from that used for other students.

Disability Access: Students with disabilities are responsible for registering with Students with Disabilities Services (SDS) in order to receive academic accommodations. SDS encourages students to notify instructors of accommodation needs at least 5 business days prior to needing the accommodation. A letter from SDS must accompany this request.

Sexual Misconduct/Sexual Harassment Reporting: USF is committed to providing an environment free from sex discrimination, including sexual harassment and sexual violence ([USF System Policy 0-004](#)). The USF Center for Victim Advocacy and Violence Prevention is a confidential resource where you can talk about incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence. This confidential resource can help you without having to report your situation to either the Office of Student Rights and Responsibilities (OSSR) or the Office of Diversity, Inclusion, and Equal Opportunity (DIEO), unless you request that they make a report. Please be aware that in compliance with Title IX and under the USF System Policy, educators must report incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence. If you disclose any of these situations in class, in papers, or to me personally, I am required to report it to OSSR or DIEO for investigation. Contact the USF Center for Victim Advocacy and Violence Prevention: (813) 974-5757.

Attendance Policy: Students are expected to attend classes. Faculty must inform students of attendance requirements on syllabi. Instructors should accommodate excused absences by making arrangements with students ahead of time (when possible) or by providing a reasonable amount of time to make up missed work.

Professionalism Policy: Per university policy and classroom etiquette; mobile phones, iPods, etc. **must be silenced** during all classroom lectures. Those not heeding this rule will be asked to leave the classroom/lab immediately so as to not disrupt the learning environment. Please arrive on time for all class meetings. Students who habitually disturb the class by talking, arriving late, etc., and have been warned may suffer a reduction in their final class grade.

End of Semester Student Evaluations: All classes at USF make use of an online system for students to provide feedback to the University regarding the course. These surveys will be made available at the end of the semester, and the University will notify you by email when the response window opens. Your participation is highly encouraged and valued.

Turnitin.com: In this course, turnitin.com will be utilized. Turnitin is an automated system which instructors may use to quickly and easily compare each student's assignment with billions of web sites, as well as an enormous database of student papers that grows with each submission. Accordingly, you will be expected to submit all assignments in both hard copy and electronic format. After the assignment is processed, as instructor I receive a report from turnitin.com that states if and how another author's work was used in the assignment. For a more detailed look at this process visit <http://www.turnitin.com>. Essays are due at turnitin.com the same day as in class.

The Writing Studio: Writing Studio is a free resource for USF undergraduate and graduate students. At the Writing Studio, a trained writing consultant will work individually with you, at any point in the writing process from brainstorming to editing. Appointments are recommended, but not required. For more information or to make an appointment, visit <http://www.lib.usf.edu/writing/>, stop by LIB 2nd Floor, or call 813-974-8293.

Campus Emergencies: In the event of an emergency, it may be necessary for USF to suspend normal operations. During this time, USF may opt to continue delivery of instruction through methods that include but are not limited to: Canvas, Elluminate, Skype, and email messaging and/or an alternate schedule. It's the responsibility of the student to monitor the Canvas site for each class for course specific communication, and the main USF, college, and department websites, emails, and MoBull messages for important general information.

Online Learning

Our class will happen online. There are a few important components to making this online class a success:

1. *Make sure to attend the synchronous lectures.* Each module has one lecture where we will meet as a class--these will help us build our learning community, as well as allow a more traditional lecture format with the ability to ask questions and get feedback in real time. You will receive an invite to a conference from Canvas via email. You just click the link and will be prompted to log into the conference--make sure to DISABLE your audio--we will communicate via chat (otherwise it gets too crazy!).
 - a. *ALTERNATE SYSTEMS MAY BE USED IF THERE ARE TECHNOLOGY PROBLEMS--PLEASE MONITOR YOUR EMAIL AT ALL TIMES!*
2. *Make sure to follow along each module.* Each module contains two basic sorts of assignments.
 - a. First, there are videos, readings, and audio recordings relating to the theme of each unit. Each student must read, listen, and watch these. If you have any issues accessing this material, please don't hesitate to get in touch!
 - b. Second, there are discussion assignments--these require each student to come up with discussion questions relating to the theme of the module, as well as reply to other

student's questions. I have posted an initial question for each discussion topic to get us started--feel free to reply to this question or to your own!

3. *Make sure to stay in touch!* If you are confused, or have ANY questions, please don't hesitate to get in touch! Please email me at big@usf.edu or contact me via Canvas email. I will reply ASAP! There are also many resources if you need help with technology, disability issues, or any other academic issue. Here are some helpful links:
- a. Disability Services: <http://www.usf.edu/student-affairs/student-disabilities-services/>
 - b. CANVAS help:
 - i. Quickstart Guide: <https://community.canvaslms.com/docs/DOC-2036>
 - ii. Student Video Guide: <https://community.canvaslms.com/docs/DOC-3891>
 - iii. Student Guide: <https://community.canvaslms.com/docs/DOC-4121>
 - c. Technical Problems: For technical questions and support, contact the IT Help Desk at (813) 974-1222 or help@usf.edu.
 - i. To resolve your issue quicker, please include the following information:
 - ii. Course ID if the problem occurred within a course.
 - iii. What you were trying to do when the problem occurred.
 - iv. The exact wording of any error you received.
 - d. Academic Support Services: <http://www.usf.edu/student-success/undergrads/>
 - e. The Library has many helpful resources as well: <http://www.lib.usf.edu/>
 - f. LinkedIn Learning has a suite of learning tutorials for a variety of software applications and topics.
 - i. To access, login to MyUSF and go to the Learning and Teaching Tools menu.
 - ii. Select Online Training (LinkedIn Learning).

Important Dates

The schedule of online attendance is as follows (subject to change!)

MODULE 0: Introduction

T 8/23 – Introductory Lecture

MODULE 1: The History of the Scientific Revolution

T 8/30 - What was known? Part I

T 9/6 - *No class – Prof. Goldberg is at a conference*

T 9/13 - What was known? Part II

T 9/20 - How did they know it? Part I

T 9/27 - Writing Workshop

T 10/4 - How did they know it? Part II

T 10/11 - What was knowledge used for? Part I

T 10/18 - What was knowledge used for? Part I

MODULE 2: The Philosophy and Science of Sex and Gender

T 10/25 - History of Science to Science Studies

T 11/1 - Sex and Gender 1

T 11/8 - Sex and Gender 2

T 11/15 - Sex and Gender 3

T 11/22 - Sex and Gender 4

T 11/29 - Sex and Gender 5

SCHEDULE

MODULE 0: Introduction

T 8/23 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Link will be sent to your CANVAS email

Introduction and overview

MODULE 1: The History of the Scientific Revolution

TH 8/25 - INDEPENDENT WORK

- Shapin, Chapter 1
- Galileo Galilei, *Letter on Sunspots* (1613), pdf on Canvas.
- Galileo, *The Assayer* (1623), pdf on Canvas.

T 8/30 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: What was known? Part I

Th 9/1 - INDEPENDENT WORK

- Shapin Chapter 1
- Robert Boyle, *New Experiments Physico-Mechanical* (1660), pdf on Canvas
- Robert Hooke, *Micrographia* (1665), pdf on Canvas, selections: preface, 1-5, 112-116, 153-154, 171-172, 175-180, 210-217, 242-246.

T 9/6 – Th 9/8 No class – Prof. Goldberg is at a conference

T 9/13 **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: What was known? Part II

Th 9/15 – INDEPENDENT Work

- Shapin Chapter 2
- Robert Boyle, *New Experiments Physico-Mechanical* (1660), pdf on Canvas
- Robert Hooke, *Micrographia* (1665), pdf on Canvas, selections: preface, 1-5, 112-116, 153-154, 171-172, 175-180, 210-217, 242-246.
- Galileo, “Letter to the Grand Duchess of Tuscany”, <https://sourcebooks.fordham.edu/mod/galileo-tuscany.asp>
- Francis Bacon, “Aphorisms”, <https://sourcebooks.fordham.edu/mod/bacon-aphor.asp>
- Voltaire, “On Francis Bacon”, <https://sourcebooks.fordham.edu/mod/1778voltaire-bacon.asp>

T 9/20 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: How did they know it? Part I

Th 9/22 – INDEPENDENT Work

William Harvey, *De motu cordis* (Frankfurt, 1628),

- <https://sourcebooks.fordham.edu/mod/harvey-blood.asp>
Preface, Introduction, Exs. 1, 8, 9, 10, 12
- Vesalius, “De Fabrica – frontispiece”,
 - <https://web.archive.org/web/19970713085715/http://www.uab.edu/reynolds/Vesal.html>
 - I also recommend just googling “Vesalius” and “De fabrica corporis humani”
- John Wallis, “Origin of the Royal Society”,
<https://sourcebooks.fordham.edu/mod/1662royalsociety.asp>

T 9/27 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

**Writing workshop and assignment discussion
COME TO CLASS WITH QUESTIONS!**

Th 9/29 - INDEPENDENT WORK

- Shapin, Chapter 2
- Steven Shapin - “The House of Experiment in 17th Century England” pdf on Canvas
- Vesalius Life and Work
<https://embryo.asu.edu/pages/andreas-vesalius-1514-1564>
(see also: <https://archive.org/details/andreasvesaliusr00balluoft>)

T 10/4 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: How did they know it? Part II

Th 10/6 - INDEPENDENT WORK

- Shapin, Chapter 3
- Isaac Newton, *The Mathematical Principles of Natural Philosophy*, Laws of Motion,
<http://jamesbrennan.org/physics/notes/Force/axioms.htm>;
- The General Scholium, vol. <http://isaac-newton.org/general-scholium/>
- Isaac Newton, *Opticks*, 4th ed. (London, 1730), Query 31,
<http://www.newtonproject.sussex.ac.uk/view/texts/normalized/NATP00051>

T 10/11 **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: What was knowledge used for? Part I

Th 10/13 - INDEPENDENT WORK

- John Maynard Keynes, “Newton, the Man,” in *The Royal Society, Newton Tercentenary Celebrations, 15-19 July 1946* pdf on Canvas

- Newton's Alchemy and Chymistry
<https://webapp1.dlib.indiana.edu/newton/project/about.do>

T 10/18 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: What was knowledge used for? Part II

Module 2: The Philosophy and Science of Values and Gender

Th 10/20 - INDEPENDENT WORK

- Jacob, Margaret C. 1999. "Science Studies after Social Construction" pdf on Canvas
- Jasanoff, Sheila. 2000. "Reconstructing the Past, Constructing the Present: Can Science Studies and the History of Science Live Happily Ever After?" pdf on Canvas

T 10/25 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: From the History of Science to Science Studies

Th 10/27 - INDEPENDENT WORK

- AFS, Ch.1-2

T 11/1 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: Sex and Gender 1

Th 11/3 - INDEPENDENT WORK

- AFS, Ch.3
- Hrdy, Sarah Blaffer 1986, "Empathy, Polyandry, and the Myth of the Coy Female" pdf on Canvas

T 11/8 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: Sex and Gender 2

Th 11/10 - INDEPENDENT WORK

- AFS, Ch.3-5
- Lloyd, Elisabeth 1996, "Science and Anti-Science: Objectivity and Its Real Enemies," pdf on Canvas

T 11/15 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: Sex and Gender 3

Th 11/17 - INDEPENDENT WORK

- AFS, Ch. 6-8
- Lloyd, Elisabeth 1996, “Science and Anti-Science: Objectivity and Its Real Enemies,” pdf on Canvas

T 11/22 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: Sex and Gender 4

Th 11/24 - INDEPENDENT WORK

- AFS, Ch.9-10
- Martin, Emily 1991, “The egg and the sperm: How science has constructed a romance based on stereotypical male-female roles,” pdf on Canvas

T 11/29 - **ONLINE LECTURE – ATTENDANCE REQUIRED**

Lecture: Sex and Gender 5