

University of Wisconsin-Madison  
**History of Science 202: The Making of Modern Science**  
**Integrated Liberal Studies 202: Western Culture: Science, Technology, Philosophy II**  
Spring 2022

Canvas: <https://canvas.wisc.edu/courses/234797>

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### Contents of this Syllabus

This syllabus provides details on course policy, grades, schedule and readings.

- Course details and policies are on pages **1-6**
- Tips on Course Themes and How to Read and prepare for class are on **pages 7-9**
- Grade components are on **pages 9-11**
- The Week-by week schedule with readings, quizzes, exams etc. are on **pages 12-17**

### Course Description

This course provides an introduction to major developments in the history of science from the mid-seventeenth century until the beginning of the 21<sup>st</sup> that have brought about a dramatic change in the way the world is known. We explore when and under what conditions a specific human enterprise called ‘science’ came to be, and how it has changed. What historical factors form and shape it, and which continue to do so? How did science come to be a powerful agent in modern life, and what role did particular visions of science play in defining what we take the ‘modern’ to be in the first place?

In endeavoring to understand the history of science, we will learn about the connections between commerce, manufacture, exploration, and war, changing conceptions of people’s place in nature,

and our ability to control the world around us. In the process, we will come to a new understanding of the relationship between science, technology and society.

### **Required Texts**

- Dear, Peter, The Intelligibility of Nature: How Science Makes Sense of the World  
Chicago: University of Chicago Press, 2008 [any version]
- Other readings are provided on canvas

### **Course Meetings**

Each week you attend **two Lectures** (Tues/Thurs) and a **discussion section** (see your enrollment for details)

#### **Lectures:**

Tuesdays and Thursdays, 8:50 AM-9:40 AM in Mosse Humanities 2340

**Lecture Recordings:** Will be available on Canvas shortly after delivery, unless there are technical difficulties; synchronous attendance is **strongly** advised)

#### **Discussion Section Meetings:**

*Please consult your enrollment information and attend your assigned section—please note that there are two different courses (HISTSCI and ILS, each with their own sections)*

#### **History of Science Sections (With Bennett and Lin)**

HISTSCI 202 DIS 301 | (TA: Bennett) **Thursdays** 12:05-12:55 in 2125 Mosse Humanities  
HISTSCI 202 DIS 301 | (TA: Bennett) **Thursdays** 1:20-2:10 in 4004 Vilas Hall  
HISTSCI 202 DIS 303 | (TA: Lin) **Thursdays** 3:30-4:20 in 2131 Mosse Humanities Building  
HISTSCI 202 DIS 304 | (TA: Bennett) **Thursdays** 4:35-5:25 in 2125 Mosse Humanities Bldg.  
HISTSCI 202 DIS 305 | (TA: Lin) **Fridays** 8:50-9:40 in 2125 Mosse Humanities Building  
HISTSCI 202 DIS 306 | (TA: Lin) **Fridays** 9:55-10:45 in 2631 Mosse Humanities Building  
HISTSCI 202 DIS 307 | (TA: Bennett) **Fridays** 11:00-11:50 in 2125 Mosse Humanities Bldg.  
HISTSCI 202 DIS 308 | (TA: Lin) **Fridays** 12:05-12:55 in 2125 Mosse Humanities Building

#### **Integrated Liberal Studies Sections (With Sara and Aijie)**

ILS 202 DIS 301 | (TA: AJ) **Mondays** 12:05-12:55 in 130 Brogden Psychology Building  
ILS 202 DIS 302 | (TA: AJ) **Mondays** 1:20-2:10 in 130 Brogden Psychology Building  
ILS 202 DIS 303 | (TA: Sara) **Wednesdays** 12:05-12:55 in 130 Brogden Psychology Building  
ILS 202 DIS 304 | (TA: Sara) **Wednesdays** 1:20- 2:10 in 115 Brogden Psychology Building  
ILS 202 DIS 305 | (TA: Sara) **Tuesdays** 2:25-3:15 in 103 Meiklejohn House  
ILS 202 DIS 306 | (TA: Sara) **Tuesdays** 3:30-4:20 in 103 Meiklejohn House  
ILS 202 DIS 307 | (TA: AJ) **Thursdays** 2:25-3:15 in 103 Meiklejohn House  
ILS 202 DIS 308 | (TA: AJ) **Thursdays** 3:30-4:20 in 103 Meiklejohn House

### Credit Hour Details

This class meets for three, 50-minute class periods each week (2 lectures, 1 discussion) over the fall semester and carries the expectation that students will work on course learning activities (reading, writing, watching supplemental video material and responding to quizzes on canvas, working on writing assignments studying for examinations) for about **2 hours out of the classroom for every class period (about 6 hours per week)**.

### Office Hours:

Office hours are a chance for you to meet with the teaching team to discuss course material, issues, or your interests. This time is yours!

**Prof. Kennedy:** Thursdays 11:30-1:30 in Mosse Humanities 4127

Appointments Preferred: <https://calendly.com/devinkennedy/officehours>

**Sara Paris** by appointment on Zoom (see canvas for link)

**Bennett McIntosh** Tuesday 10-12 on Zoom or by appointment (see canvas for link)

**Aijie Shi** by appointment on Zoom (see canvas for link)

**Ye Lin** by appointment on Zoom (see canvas for link)

### Learning Outcomes

Students, upon successful completion of the course, will be able to:

- Identify key concepts, periods, and themes in the history of science
- Recognize some social, cultural, intellectual, and material factors shaping the development of science since the 17<sup>th</sup> century
- Analyze and situate in historical context, primary cultural and technical sources from the history of science
- Speak and write about science as a socially situated and historically changing enterprise
- Collaborate with peers, and lead a discussion including through the preparation of questions and notes

**Students enrolling in ILS 202** will earn *natural sciences* credit. Discussion sections will focus on developing understanding of the scientific concepts covered by this course, and written work (the mid-term, exam, and quizzes) will require you to demonstrate this understanding. This does not mean that you will be tested on equations and math, but it does mean that your work for this course should include comprehending key features of the science we discuss.

**Students enrolling in HistSci 202** will earn *humanities* credit. This means that their discussion sections will focus on understanding the *historical contexts* of the science covered by this course, and that the assessed work you do will require you to demonstrate this understanding. This does not mean that the science you know is irrelevant. But it does mean that your work for this course (in discussion sections, and in quizzes, the mid-term and the final examination) will focus on learning placing the science we discuss in its historical context.

### **Face Masks:**

In accordance with University Policy, students, faculty, and staff are required to wear a face mask while inside any university building, this will include during lectures, discussion sections, and in office hours. Face coverings must be worn correctly (i.e., covering both your mouth and nose) in the building if you are attending class in person.

Students with disabilities or medical conditions who are unable to wear a face covering should contact the McBurney Disability Resource Center or their Access Consultant if they are already affiliated. Students requesting an accommodation unrelated to disability or medical condition, should contact the Dean of Students Office.

Students not wearing a face covering will be asked to put one on or leave the classroom. Students who refuse to wear face coverings appropriately or adhere to other stated requirements will be reported to the Office of Student Conduct and Community Standards and will not be allowed to return to the classroom until they agree to comply with the face covering policy. An instructor may cancel or suspend a course in-person meeting if a person is in the classroom without an approved face covering in position over their nose and mouth and refuses to immediately comply.

### **Absences due to Covid-19**

Individual students unable to attend in-person lectures for COVID-19-related reasons should contact me, Professor Kennedy to discuss options for access to course materials and activities. If you cannot attend discussion sections, please contact your Teaching Assistant. We are happy to support you in these circumstances so please just do be in touch. Students who must miss multiple class sessions should talk with me and with their academic advisor about the best course of action.

If multiple students in a course section must miss in-person class meetings for COVID-19-related reasons, every effort should be made to avoid a disruption of in-person instruction. Instructors should work with their department, school and college to explore ways to provide students who cannot attend in-person sessions access to course materials and activities. Any interruption of in-person instruction should be temporary and brief.

### **Course Details**

#### **History of Science 202**

**Prerequisites:** None

**Course Designation:** Breadth - Humanities

**Level:** Elementary

**Credits:** 3

**Modality:** In-person

#### **Integrated Liberal Studies 202**

**Prerequisites:** None

**Course Designation:** Breadth – Natural Sciences

**Level:** Elementary

**Credits:** 3

**Modality:** In-person

### **Academic Integrity**

By virtue of enrollment, each student agrees to uphold the high academic standards of the University of Wisconsin-Madison; academic misconduct is behavior that negatively impacts the integrity of the institution. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these previously listed acts are examples of misconduct which may result in disciplinary action. Examples of disciplinary action include, but is not limited to, failure on the assignment/course, written reprimand, disciplinary probation, suspension, or expulsion.

### **Accessibility and Diversity**

I aspire to create a classroom strengthened by students who feel heard, safe, and supported. I am committed to providing any accommodations that will enable you to thrive in our course, including but not limited to those requested through the McBurney Disability Resource Center. If you are in need of additional accommodations, please feel free to speak with Professor Kennedy, or the McBurney Center

The McBurney Disability Resource Center Phone: (608) 263-2741 Address: 702 W. Johnson Street, Suite 2104 Email: [mcburney@studentlife.wisc.edu](mailto:mcburney@studentlife.wisc.edu)

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

### **Technology**

You may use laptops or electronic devices to take notes in lecture and in discussion sections; as you know digital devices are great tools but also distracting. Please don't let your devices get in the way of your engagement in class or your classmates!

With the exception of the course text, all materials (text, links to audio and video clips) are provided on Canvas, but if you are having trouble, please be in touch with Professor Kennedy or your TA.

Lecture recordings are available on canvas on the page titled Kaltura Gallery shortly after they are delivered.

## **Lecture Recordings and Intellectual Property**

Recordings will be provided on Kaltura Media Space.

Lecture materials and recordings for this course are protected intellectual property at UW-Madison. Students in this course may use the materials and recordings for their personal use related to participation in this class. Students may also take notes solely for their personal use. If a lecture is not already recorded, you are not authorized to record my lectures without my permission unless you are considered by the university to be a qualified student with a disability requiring accommodation. [Regent Policy Document 4-1] Students may not copy or have lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities. Students are also prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.

## **Religious observations**

Please be in touch with Professor Kennedy early in the semester if you expect your observation of religious holidays or events will conflict with course events, including but not limited to the final exam. We are happy to help make alternative accommodations.

## **Regular and substantive student-instructor interaction**

Students will receive regular and substantive interaction with instructor, as well as teaching assistants, during in-person lectures, discussion sections, through feedback on written assignments, and in one-on-one meetings in office hours.

## Big Ideas Addressed in this course:

This course covers a lot of ground. We are studying 400 years of science in Western Europe and the United States. We're going to be focusing on episodes and histories that engage a specific set of five themes, critical to the history of science. These themes connect our study across time and place, and will be the sort of topic that you'll be asked to analyze on the mid-term and final exam. In this course we're looking at how answers to the questions posed below *change over time*: for instance, what are some differences in the way scientific expertise is made; between the time of Robert Boyle and the time of "Big Science" in the 1960s.

### **1) Religion and Human Nature**

How does science, as a body of knowledge and a set of practices for producing knowledge interact with other ways of knowing, predicting, and interpreting the natural world? Likewise, how does science interact with other socially potent ways of thinking about human beings, their moral capacities, and their relation to nature?

### **2) Economy and Commerce**

How do scientific ideas emerge from, or respond to the practicalities of business or political economy? How do material conditions enable various institutions and forms of scientific practice, and ideas about science?

### **3) Politics and the State**

What is the role of governing institutions in shaping and supporting scientific practice and scientific ideas? What role does science play in the governance of nations? How does science relate to ideas about the good governance of a nation?

### **4) Expertise and Democracy**

On what basis do we come to trust the knowledge produced by others, including those specifically engaged in scientific endeavors? What frictions exist between trust in experts and ideals of democracy or self-governance, and how do societies manage it?

### **5) Knowledge and Power**

How does scientific knowledge, its application, and its authority stem from or contribute to the arrangement of *power* between people and groups? Conversely, how do individuals and groups use scientific knowledge and knowledge practices to unseat dominant forms of social power?

## Note on Reading

This is a reading intensive course; requiring about 2-3 hours of reading per week; consisting typically of 60-80 pages (normally two chapters worth) of secondary sources by historians, plus another 5-10 pages of primary source reading (by historical figures and persons). There are no writing assignments, with the exception of the writing component of the group project; as such, a major component of your grade depends on you keeping up with weekly readings, and being prepared to discuss them in sections, and to answer questions about them in the four multiple choices quizzes. The Mid-term and Final exam will expect that you have kept up with readings, and are capable of deploying them in short essay responses.

## How to Read for this Course:

Almost every week, you will read a couple of chapters from a secondary source written by a historian, and a couple of primary sources from historical figures involved in the events we are discussing. You must read in advance of your discussion section, and as early in the week as possible, since I will occasionally refer to the materials in lecture and would invite you to share your ideas.

### Here are some general ideas to guide your reading:

- 1) **Secondary Sources:** Secondary sources provide, in combination with lecture, a general narrative of the history we are covering in course; it is not expected or required that you know every date and every name, but you should read secondary sources to strengthen and expand upon the narrative of history I provide during lecture.
  - a. Each secondary source should be read towards the “who what where why when +”:
    - i. **who** is involved in the story the author tells (the few names or groups of people that seem most important, or that drive the story forward);
    - ii. **what** is happening: what are the historical changes in politics, society, science or ‘natural philosophy’ that are being described? (no detailed technical knowledge of scientific ideas are expected; just a basic, rough sketch of what they understood as a scientific question and how they solved it)
    - iii. **where** both in terms of geography, but also in what sort of institutions are involved
    - iv. **when** is the story happening generally either given by an approximate date (within a half-century in material before 1900, or to a decade or two in the 20<sup>th</sup> century) *or connected with a historical period (e.g. the Cold War, World War II, the French Revolution)*
    - v. **why** is the story important/interesting/relevant to our understanding of the history of science (this is hard, because it is a judgement; there’s no right answer here, but thinking about it will help you remember the rest!
    - vi. **+ critical engagement:** what in the emphasis of the historian’s story, their argument, or who is left out strikes you as deserving of criticism, engagement, or refinement?
  - b. Discussion sections will clarify which aspects of the story presented in secondary sources are most important to understand and retain for the mid-term and final exam.
- 2) **Primary Sources:** Primary sources are documents produced by historical figures from the past, either describing contemporaneous events, or produced in the conduct of those events.

They are challenging works to read and understand: they are written by figures probing at the limits of human knowledge, working in time periods long before our own, in languages (even when translated into modern English) and styles that are different from ours. It is not expected that you will understand them entirely in advance of discussion sections.

**Your task for primary source readings is to read for the following:**

- a. Who is writing and when?
  - b. What, generally, they are talking about (what matter is made of vs. how life emerged vs. what is nature... etc.)?
  - c. How they discuss that topic:
    - i. What is the basic idea of the argument?
    - ii. What kind of evidence, experiments, ideas are they using to make their argument?
    - iii. What is the style of argument (a story about their own life, a factual report of an event, an argument about their own trustworthiness etc.)?
  - d. Highlight or underline words, arguments, concepts that connect the text to other ideas from lectures, secondary sources, or other knowledge of yours including:
    - i. Things that surprised you
    - ii. Confusing ideas
    - iii. Specific differences between the way we understand a topic now versus then (however we are not trying to debunk the science of the past—instead to understand it as it was understood then)
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**Grade Components**

- 4 Multiple Choices Quizzes 20%
- Mid Term Exam 15%
- Final Exam: 20%
- Group Project: 20% *Group-Led Discussion*
  - Preparation of Notes Sheet and Questions 10%
  - Facilitation of Session 10%
- Discussion Section Participation and attendance 25%

**20% Multiple Choices Quizzes**

Four times during the semester, you will be given a timed, 20-minute quiz on canvas with a number of multiple choice questions related to material from the previous 2-3 weeks of class (the time between that quiz and the one before it). These will test that you are keeping up with readings and understand and can identify key concepts, persons, and texts. They are **open-book**, but **your work must be your own**.

## **15% Mid-term Exam**

The mid-term exam will have you perform two types of exercises: short-answer questions that specifically ask you about a single scientific idea, episode, or person (requiring a 2-3 sentence response); and medium-length essays that ask you to bring together ideas from different weeks and make a thesis based on change over time.(requiring about 2 paragraphs of response).

Full credit is given to detailed responses that demonstrate familiarity with the text, and understanding of the historical context and relevance of the quotation to the story we are telling in class.

**The mid-term and the final are open-notes and open-book** but time-limited, and all work must be your own. *Both examinations will take place on Canvas.*

## **20% Final Exam**

The final exam will be of a similar form to the mid-term, consisting of a group of short-answer and medium-length essay questions; just a bit longer. The mid-term and the final are open-notes and open-book but time-limited, and all work must be your own. *Both examinations will take place on Canvas.*

## **20% Group Project**

In the early weeks of class, you will be connected with members of your discussion section to participate in a group activity that will culminate in the second half of the semester. The assignment is to prepare to run a discussion section, producing a note sheet, discussion questions and guiding your classmates towards analysis of the week's texts and course content with discussion questions. You will be responsible for 30 minutes of class time (your TA will still be there to run the session for the remaining 20 minutes, to answer questions and discuss lecture materials). This is an opportunity for you to learn skills for how to participate in a discussion course effectively, a skill for your future coursework at UW-Madison. We welcome you and your group to bring in your own interests to the conversation. Details will be given in week 3, and these student-led sessions will begin after the mid-term.

## **25% Discussion Section Participation and attendance**

### **Attendance:**

**You must attend all discussion section meetings.** You are permitted two “freebies” unexcused, unexplained absences from discussion sections. Additionally, if something comes up (a doctor's visit, family situation) you should be in touch with your TA and Professor Kennedy to request an excused absence, but please try to do so in advance if possible to arrange alternative work. **You will lose 5% on your discussion grade for each additional unexcused absence.** (e.g. if you finish with a 90% on your participation as

described in the rubric below, but you have three unexcused absences you'll receive an 85% on your discussion grade for the semester).

Participation is a significant component of your grade in this course. We understand that not all students contribute by making lengthy comments! You are graded on your contributions to class meetings and discussions, not simply in terms of the amount you speak, but also on your productive engagement with your classmates' ideas. We will discuss in greater detail expectations for participation, ideas for how to build upon each other's comments, standards of behavior and respect in our classroom community, and the way you will be evaluated.

**Discussion Participation Rubric**

Excellent (90-100)	Good (80-90)	Competent (70-80)	Inadequate (60-70)	Fail (0-60)
<ul style="list-style-type: none"> <li>-Mastery over readings and previous discussion</li> <li>-Explores questions rigorously</li> <li>-Comes to class with interpretations and questions</li> <li>-Engages others respectfully</li> </ul>	<ul style="list-style-type: none"> <li>-Knows readings well</li> <li>-Consistent preparation and involvement</li> <li>-Offers analysis of texts in class</li> </ul>	<ul style="list-style-type: none"> <li>-Basic grasp of reading</li> <li>-Mostly offers facts or surface-level interpretations</li> <li>-Contributes when called upon but not actively engaged</li> </ul>	<ul style="list-style-type: none"> <li>-Insufficient command of reading</li> <li>-Attempts to contribute facts or interpretations when called but unable to offer substance</li> </ul>	<ul style="list-style-type: none"> <li>-Uninvolved</li> <li>-Unexcused</li> <li>-Disruptive</li> </ul>

**Grade Scale**

- A 93-100
  - AB 88-93
  - B 82-88
  - BC 77-82
  - C 72-77
  - D 67-72
  - F Below 67.
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## **Week 1: Introduction**

January 25    Lecture 1: Introduction: What is Science?  
January 27    Lecture 2: Our approach to the history of science

### ***Read:***

1. Dear, Peter The Intelligibility of Nature Introduction
2. Prescod-Weinstein, Chanda “Stop Equating Science with Truth” *Slate.com* August 9, 2017 [canvas]
3. Jewett, Andy “What Attacks on Science Get Wrong” *Chronicle of Higher Education* December 9, 2020 [Canvas]

## **Week 2: Revolutions in Heaven and on Earth (1543-1675)**

### **\*\*First Discussion Section Meetings Discussing Week 1 and 2 Readings**

February 1    Lecture 3: Copernicus, Galileo and the “Scientific Revolution”  
February 3    Lecture 4: The Culture of Experiment

### ***Read:***

#### **Secondary sources:**

1. Shapin, Steven The Scientific Revolution Chapter 1: What was Known? [canvas]

#### **Primary Sources:**

2. Galilei, Galileo “Letter to the Grand Duchess Christina, 1615 Selections [canvas]
3. [Skim] Boyle, Robert “New experiments about the weaken’d Spring and some unobserv’d Effects of the Air.” Selections *Philosophical Transactions of the Royal Society, 1204 December 27, 1675* [canvas]

## **Week 3: Natural and Mechanical Philosophy (1637-1727)**

February 8    Lecture 5: The Mechanical Philosophy in the 17<sup>th</sup> Century  
February 10    Lecture 6: Isaac Newton: Gravity and the Divine Sensorium

Discussion Sections: Discussing Week 3 Readings

### **\*\*February 11:        Quiz 1 [canvas] (Covering Week 2 and 3 Material)**

### ***Read:***

#### **Secondary sources:**

1. Dear, Peter The Intelligibility of Nature Chapter 1, “The Mechanical Universe from Galileo to Newton”

#### **Secondary sources:**

2. Cavendish, Margaret, Duchess of Newcastle Grounds of Natural Philosophy Selections 1668 [canvas]
3. Letters from the Clarke-Leibniz Correspondence, 1715-1716 [canvas]

#### **Week 4: Social Revolution and the Culture of Reason (1751-1843)**

February 15 Lecture 7: Categorizing Knowledge  
February 17 Lecture 8: The Culture of Reason

Discussion Sections: Discussing Week 4 Readings

##### ***Read:***

##### **Secondary sources:**

1. Dear, The Intelligibility of Nature Chapter 2 “A Place for Everything”

##### **Primary sources:**

2. d’Alambert, Jean le Rond “Preliminary Discourse to the Encyclopedia of Diderot” 1751 [canvas]
3. Lovelace, Ada Notes on *Sketch of the Analytical Engine Invented by Charles Babbage* 1843

#### **Week 5: Imperialism and Order (1735-1850)**

February 22 Lecture 9: Numbers and Reason  
February 24 Lecture 10: Empire and Violence in Atlantic Science

Discussion Sections: Discussing Week 5 Readings

**\*\*February 25: Quiz 2 (covering weeks 4-5) [canvas]**

##### ***Read:***

##### **Secondary sources:**

1. Cohen, Patricia Cline A Calculating People: The Spread of Numeracy in Early America Selections
2. Kean, Sam "Historians expose early scientists' debt to the slave trade" *Science* April 4, 2019 [link on canvas]

##### **Primary sources:**

3. Linnaeus, Carl Systema Naturae 1735 [System of Nature] Selections [canvas]

#### **Week 6: Evolution and the Age of the Earth (1830-1870)**

March 1        Lecture 11: Natural History and the Age of the Earth  
March 3        Lecture 12: Darwin and Evolution

Discussion Sections: Discussing Week 6 Readings

**Read:**

**Secondary sources:**

1. Dear, Peter The Intelligibility of Nature Chapter 4 “Design and Disorder”

**Primary sources:**

2. Darwin, Charles The Origin of Species Chapter XIV “Conclusion and recapitulation.”  
[On canvas]

**Week 7: Biology and Statecraft (1860-1910)**

March 8        Lecture 13: Life in America: Biology and Scientific Institutions in the US  
March 10       **Mid-term Exam in Class (Covering through week 6)**

Discussion Sections: Continuing discussion of Darwin and Week 7 Material

**Read:**

**Primary sources:**

1. Carr, Ezra *The Patrons of Husbandry on the Pacific Coast, being a complete history of the origin, condition and progress of agriculture in different parts of the world* “Higher Agricultural Education,” 1875

***WEEK 8 (March 14-18) SPRING BREAK – No Class***

**Week 9: Science and Modern Life (1870-1930)**

March 22        Lecture 14: From Darwin to Eugenics  
March 24        Lecture 15: Energy, Efficiency, Electricity

Discussion Sections: Discussion of Week 7 + 9 Material

**Read:**

**Secondary sources:**

1. Dear, Peter The Intelligibility of Nature Chapter 5, “Dynamical Explanation: The Aether and Victorian Machines”
2. Alexander, Jennifer The Mantra of Efficiency Chapter 4, “Balance and Transformation”  
[canvas]

**Week 10: Modernity, Relativity and the Atom (1900-1938)**

March 29                      Lecture 16: The Einstein Revolution  
March 31                      Lecture 17: World War I, International Science, and Quantum Mechanics

**Read:**

**Secondary Sources**

1. Dear, Peter The Intelligibility of Nature Chapter 6, “How to Understand Nature? Einstein, Bohr and the Quantum Universe”

**Primary Sources**

2. Curie, Marie Sklodowska “Radium and the New Concepts in Chemistry” 1911 Nobel Prize Banquet Address
3. Owen, Wilfred “Dulce et Decorum Est” 1921 [link on canvas]
4. 2 Accounts of Chlorine Gas attack at the Second Battle of Ypres April-May 1915 [link on canvas]

**Week 11: Atomic Sovereignty 1938-1969**

April 5                      Lecture 17: World War II: The Physicists War  
April 7                      Lecture 18: The ideology of free science and the Cold War

**Read:**

**Secondary Sources**

1. Iber, Patrick “How the Cold War Defined Scientific Freedom” [review of Audra Wolfe’s Freedom’s Laboratory] *The New Republic* [canvas]
2. Kaiser, David and Benjamin Wilson “American Scientists as Public Citizens: 70 Years of the Bulletin of Atomic Scientists” *Bulletin of the Atomic Scientists* [canvas]

**Primary Sources**

3. Einstein, Albert “Letter to President Roosevelt” [the Einstein-Szilard Letter] 1939 [canvas]
4. Watch: “One world or None” 1946 Film (9:11)

**Week 12: When Science got Big 1958-1973**

April 12                      Lecture 19: Big Science  
April 14                      Lecture 20: Hippie Science, Activist Science, and Quantum Mechanics

**\*\*April 15      Quiz 3 [canvas] (covering weeks 9-11)**

**Read:**

**Secondary Sources**

1. Kaiser, David How the Hippies Saved Physics: Counterculture and the Quantum Revival Introduction and Chapter 1 [canvas]

### ***Primary Sources***

2. Eisenhower, Dwight “President’s Farewell Address to the Nation” January 17, 1961 [canvas]
3. Science for the People “Calculus for Conquest” March, 1973 [canvas]

### **Week 13: Biology and Politics 1920-1975**

April 19      Lecture 21: Human Nature  
April 21      Lecture 22: DNA and Gender in Scientific Research

#### ***Read:***

#### ***Secondary Sources***

1. Larson, Edward Summer of the Gods: The Scopes Trial and America’s Continuing Debate Over Science and Religion Introduction and Chapter 2: “Government by the People” [canvas]
2. Watch: “Secret of Photo 51” [on Rosalind Franklin] *Nova* [link on canvas]
3. Keller, Evelyn Fox and Bill Moyers Transcript of Conversation for his TV show “World of Ideas” 1990 [canvas]

### **Week 14: Life on Earth, 1962-2016**

April 26      Lecture 23: Genetics, Race, and Society  
April 28      Lecture 24: Ecology, Environment and Climate

**\*\*\*April 29              Quiz 4 (covering weeks 12-13) [canvas]**

#### ***Read:***

#### ***Primary Sources***

1. Carson, Rachel Silent Spring Selections (and introduction by Lear) (1962)

#### ***Secondary Sources***

2. Oreskes, Naomi and Erik Conway Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming Chapter 6: “The Denial of Global Warming” [canvas]
3. Watch: Alondra Nelson, “The Social Life of DNA” 2017 British Journal of Sociology Lecture [only required to watch until 52:45]

### **Week 15: Big Data, Small Particles, Black Holes, 1996-2020**

May 3              Lecture 26: Climate Change, Cont.  
May 5              Lecture 27: The “End of Theory” and the “Theory of Everything”

*No Reading*

**FINAL EXAM INFO TBA**

*The final exam will take place on canvas—but will be timed. You do not need to be in Madison to take it.*