

## Term Information

Effective Term Autumn 2022  
*Previous Value* Autumn 2018

## Course Change Information

### What change is being proposed? (If more than one, what changes are being proposed?)

Adding the Citizenship for a Diverse and Just World new GE

### What is the rationale for the proposed change(s)?

The ability to understand, identify, and use scientific facts is absolutely essential to informed citizenship in the modern world. Making an informed judgement on almost any topic, from gun crime to climate change, involves the capacity to sift facts from half-truths and lies. There is perhaps no greater threat to our democracy than fake news.

Facts can also be weapons. Facts have been used to advance ideas that we are naturally selfish or naturally cooperative. They have also been used to advance pernicious ideas of white supremacy, to suggest that patriarchy is natural, and that homosexuality is a disease. Facts cannot be dissociated from politics.

Facts, however, have a history. By studying this history, students are hopefully equipped to be effective citizens in a complex world.

### What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

n/a

Is approval of the request contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

## General Information

Course Bulletin Listing/Subject Area	History
Fiscal Unit/Academic Org	History - D0557
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	3712
Course Title	Science and Society in Europe, from Newton to Hawking
Transcript Abbreviation	Sci & Soc Mod Eur
Course Description	The history of science from the eighteenth through to the late twentieth century. Students will study major developments in the physical, geological, biological and chemical sciences, and the relation of the history of science to social, economic, political and cultural developments in European history.
Semester Credit Hours/Units	Fixed: 3

## Offering Information

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week, 6 Week, 4 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No

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<b>Course Components</b>	Lecture
<b>Grade Roster Component</b>	Lecture
<b>Credit Available by Exam</b>	No
<b>Admission Condition Course</b>	No
<b>Off Campus</b>	Never
<b>Campus of Offering</b>	Columbus, Lima, Mansfield, Marion, Newark, Wooster
<b><i>Previous Value</i></b>	<i>Columbus, Lima, Mansfield, Marion, Newark</i>

## **Prerequisites and Exclusions**

<b>Prerequisites/Corequisites</b>	Prereq or concur: English 1110.xx, or permission of instructor.
<b>Exclusions</b>	
<b>Electronically Enforced</b>	No

## **Cross-Listings**

Cross-Listings

## **Subject/CIP Code**

<b>Subject/CIP Code</b>	54.0104
<b>Subsidy Level</b>	Baccalaureate Course
<b>Intended Rank</b>	Sophomore, Junior, Senior

## **Requirement/Elective Designation**

Required for this unit's degrees, majors, and/or minors  
General Education course:  
Historical Study; Citizenship for a Diverse and Just World  
The course is an elective (for this or other units) or is a service course for other units

### ***Previous Value***

*Required for this unit's degrees, majors, and/or minors*  
*General Education course:*  
*Historical Study*  
*The course is an elective (for this or other units) or is a service course for other units*

## **Course Details**

<b>Course goals or learning objectives/outcomes</b>	<ul style="list-style-type: none"><li>• To acquaint students with the history of science in modern Europe.</li><li>• To familiarize students with key intellectual and theoretical changes in the way modern Europeans think about the physical and biological world (including their own bodies).</li><li>• To introduce students to some critically important contemporary scientific concepts and debates, like those surrounding AIDS, the human genome project and climate science.</li><li>• To incorporate the history of science into broader European histories (political, social, cultural and economic).</li></ul>
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**Content Topic List**

- Scientific Revolution
- Natural history
- Geology
- Chemistry
- Evolutionary biology
- Nineteenth and twentieth-century physics
- Social sciences
- Nineteenth and twentieth-century medicine
- Science and religion
- Pseudoscience
- Environmental sciences

**Sought Concurrence**

No

**Attachments**

- History 3712 Citizenship Theme Form.pdf: New GE form  
*(Other Supporting Documentation. Owner: Heikes, Jacklyn Celeste)*
- History 3712 syllabus New GE2021.docx: Syllabus  
*(Syllabus. Owner: Heikes, Jacklyn Celeste)*

**Comments**

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Heikes, Jacklyn Celeste	11/17/2021 02:36 PM	Submitted for Approval
Approved	Soland, Birgitte	11/17/2021 08:52 PM	Unit Approval
Pending Approval	Vankeerbergen, Bernadette Chantal	11/17/2021 08:52 PM	College Approval

# HISTORY 3712: SCIENCE AND SOCIETY IN MODERN EUROPE

Semester/Year  
Room/Building  
Date/Time

**Instructor:** Chris Otter  
**Office:** Dulles Hall 263  
**Email:** otter.4@osu.edu  
**Office Hours:** XXXX

## Course Description and Goals

This course examines the history of science from the seventeenth century to today. The primary geographical focus is Western Europe (France, Germany and Britain), although there will be some focus on developments elsewhere in Europe and in America, as well as ongoing discussion of the relationship between science, empire and globalization. There are also guest lectures on nonwestern science. Throughout the course, the history of science will be related to social, economic, political and cultural developments in European history.

The course begins by looking at enlightenment science, and ends by examining the current debates surrounding human-made climate change. The course pays particular attention to the history of *facts*. There are four modules:

1. The history of the fact as an object of scientific knowledge from the Scientific Revolution onwards. Here, we pay particular focus to the formation of new facts in geology, chemistry, biology, and physics. These new facts include oxygen theory, deep time, cell theory, and germ theory. We also note how older “facts” – like the idea of a young earth – become discredited.
2. The application of scientific facts, often in combination with statistical methods, to human individuals and populations from the nineteenth centuries. Here, we pay particular attention to the ways in which science and politics combined to produce powerful ideas about race, sex, and gender.
3. The history of “scientific citizenship” – i.e. how scientists operate in the public domain, and how the public receives science. Here, particular attention is paid to the ways in which science interacts with other knowledge and belief systems, notably religion, and how women have frequently been excluded from science.
4. The fringes of science and the history of denialism. This module explores the phenomenon of pseudoscience from the nineteenth century onwards, and the twentieth-century history of denialism. In the latter case, we pay particular attention to the history of tobacco, vaccines, and climate change.

This course fulfills the general requirements and expected learning outcomes for GE themes:

GOAL 1: Successful students will analyze an important topic or idea at a more advanced and in-depth level than the foundations.

ELO 1.1: Engage in critical and logical thinking about the topic or idea of the theme.

GOAL 2: Successful students will integrate approaches to the theme by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or to work they have done in previous classes and that they anticipate doing in future.

ELO 2.1: Identify, describe, and synthesize approaches or experiences as they apply to the theme.

ELO 2.2: Demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts.

This course fulfills the specific requirements for the Citizenship for a Just and Diverse World theme:

GOAL 1: Successful students will explore and analyze a range of perspectives on local, national, or global citizenship, and apply the knowledge, skills, and dispositions that constitute citizenship.

ELO 1.1 Describe and analyze a range of perspectives on what constitutes citizenship and how it differs across political, cultural, national, global, and/or historical communities.

ELO 1.2 Identify, reflect on, and apply the knowledge, skills and dispositions required for intercultural competence as a global citizen.

GOAL 2: Successful students will examine notions of justice amidst difference and analyze and critique how these interact with historically and socially constructed ideas of citizenship and membership within societies, both within the US and/or around the world.

ELO 2.1 Examine, critique, and evaluate various expressions and implications of diversity, equity, inclusion, and explore a variety of lived experiences.

ELO 2.2 Analyze and critique the intersection of concepts of justice, difference, citizenship, and how these interact with cultural traditions, structures of power and/or advocacy for social change.

### Course Readings

There is *one* required course book, which will be used for around half the readings. It will be available at SBX. This, and other readings for the class, will be placed on 2-hour reserve at Thompson Library. Additional readings are provided through Carmen (marked with asterisk (\*) on Class Schedule).

Peter J. Bowler and Iwan Rhys Morus, *Making Modern Science: A Historical Survey*, 2<sup>nd</sup> ed. (Chicago: University of Chicago Press, 2020).

### Course Papers and Assignments

- 1. Attendance, Class Participation, and Debate Performance (15%).** Students are expected to attend every class. Each lecture will include periods where the material is

opened up to discussion and there will be some classes which are discussion-only. The best learning takes place when students participate, so students will receive credit for comments, observations, answers and questions. Students will be particularly evaluated for their participation in major class discussions and debates on gender, race and equity in science and on the history of denialism.

2. **Three Response Papers (20% each).** In weeks 4, 8, and 12, students will be given a response paper, corresponding to modules 1, 2, and 3. Each paper will offer students a choice of several questions relating to the particular module. Students pick one question and produce a 4–5-page response, correctly formatted, which refers in detail to class readings and lectures.
3. **Final Project (25%).** For the final project, students produce a longer paper (10-15 pages) on any aspect of the history of science and society in Europe from 1500 to today. Students should use at least 5 legitimate scholarly sources and they should produce an outline by week 10. With my permission, students can write about a more global topic if it covers the major themes of the course.

#### Attendance Policy

Students are expected to attend every lecture. If you can't make a lecture, please contact me in advance with a valid excuse. More than 2 unexcused absences will result in a grade of 0 for attendance and class participation.

#### Grading Scale

A (93-100), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D+ (67-69), D (63-66), D- (60-62) E (below 60).

Grades will be rounded up. For example, a 92.3 will become a 93.

#### Statement on Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

#### Statement on Disability

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can

privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12<sup>th</sup> Avenue.

### Statement on Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting [ccs.osu.edu](http://ccs.osu.edu) or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org).

### Statement on Violence and Sexual Harassment

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator at [titleix@osu.edu](mailto:titleix@osu.edu)

### Statement on Diversity

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

## **Class Schedule and Readings**

Module 1  
Facts: Their Creation and Destruction

Week 1

*The Scientific Revolution 1: Shattering the Aristotelian Cosmos*

Bowler and Morus, c2.

*The Scientific Revolution 2: The Experimental Method, the Invention of “Facts,” and the Mechanical Philosophy*

Bowler and Morus, c2.

\* David Wootton, “Facts,” in *The Invention of Science: A New History of the Scientific Revolution* (New York: Harper Perennial, 2016), 251-309.

Week 2

*Interpreting the History of Science: The Creation and Destruction of Facts*

\* Thomas Kuhn, “The Nature of Normal Science,” “The Priority of Paradigms,” “Anomaly and the Emergence of Scientific Discoveries,” and “The Response to Crisis,” in *The Structure of Scientific Revolutions*, third ed. (Chicago: University of Chicago Press, 1996), 23-34, 43-65, 77-91.

\* Ludwik Fleck, “Epistemological Conclusions from the Established History of a Concept,” in *Genesis and Development of a Scientific Fact* (Chicago: University of Chicago Press, 1979), 20-52.

*From Alchemy to Chemistry: The Development of Oxygen Theory*

Bowler and Morus, c3.

Week 3

*Geological Theories 1600-1850: The Discovery of Deep Time*

Bowler and Morus, c5.

*The Emergence of Biology: Tissues, Cells, and Reproduction*

Bowler and Morus, c7.



## Week 4

### *From Miasmas to Germs*

\* Roy Porter, "From Pasteur to Penicillin," in *The Greatest Benefit to Mankind: A Medical History of Humanity* (New York: Norton, 1999), 428-461.

### *Nineteenth-Century Physics: Energy and Thermodynamics*

Bowler and Morus, c4

## ***RESPONSE PAPER 1 HANDED OUT***

### Module 2

### Science Applied to Human Beings

## Week 5

### *Lamarck and Darwin: Evolutionary Biology*

Bowler and Morus, c6.

### *Social Darwinism and Eugenics*

Bowler and Morus, c18.

## ***RESPONSE PAPER 2 HANDED IN***

## Week 6

### *The Statistical Revolution: How Facts Became Quantifiable and Quantified*

\* Theodore Porter, "Cultures of Objectivity," and "How Social Numbers are Made Valid," in *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life* (Princeton: Princeton University Press, 1995), 3-8, 33-48.

### *Sciences of Societies and Economies*

Bowler and Morus, c13.

## Week 7

*Anthropology, Criminology and Race*

\* Stephen Jay Gould, “Measuring Heads: Paul Broca and the Heyday of Craniometry,” and “Measuring Bodies: Two Case Studies on the Apishness of Undesirables,” in *The Mismeasure of Man* (New York: Norton, 1996), 105-175.

*Science and the Mind: Psychology*

\* Stephen Murdoch, “The Birth of Modern Intelligence Tests,” “The Tests that Changed the World,” and “Nazis and Intelligence Testing,” in *IQ: A Smart History of a Failed Idea* (Hoboken: John Wiley, 2007), 29-38, 67-82, 119-138

Week 8

*Sciences of Sex and Gender*

\* Angela Saini, “Woman’s Inferiority to Man,” and “The Missing Five Ounces of the Female Brain,” in *Inferior: How Science Got Women Wrong – and the New Research That’s Rewriting the Story* (Boston: Beacon Press, 2018), 1-20, 85-109.

*Class Discussion and Debate on Science, Race, Gender and Inequality*

**RESPONSE PAPER 2 HANDED OUT**

Week 9

*Where Have We Come So Far: Class Discussion and Questionnaire*

*No Class: Work on Response Paper and Final Paper Outline*

**RESPONSE PAPER 2 HANDED IN**

Module 3

Science, Religion, and Politics

Week 10

*Scientists as Citizens: The Case of the Atomic Bomb*

\* David Rowe and Robert Schulmann, “The Second World War, Nuclear Weapons, and World Peace,” in *Einstein on Politics: His Private Thoughts and Public Stands on Nationalism, Zionism, War, Peace, and the Bomb* (Princeton: Princeton University Press, 2007), 356-405.

*Science, Religion, and the Complexities of Belief*

\* Maurice Finocchiaro. "Myth 8: That Galileo Was Imprisoned and Tortured for Advocating Copernicanism," in Ronald Numbers (ed.), *Galileo Goes to Jail and Other Myths about Science and Religion* (Cambridge, Mass: Harvard University Press, 2009), 68-78.

\* Mark Noll and David Livingstone, "Introduction," to Jeff Hardin, Ronald Numbers, and Ronald Binsley (eds.), *The Warfare Between Science and Religion: The Warfare that Wouldn't Die* (Baltimore: Johns Hopkins, 2018), 1-25.

***FINAL PAPER OUTLINE HANDED IN***

Week 11

*Women in Science: The Case of Rosalind Franklin*

\* Brenda Maddox, "The Undeclared Race," and "Eureka and Goodbye," in *Rosalind Franklin: The Dark Lady of DNA* (New York: Harper Perennial, 2003), 190-216.

*The Return of Scientific Racism? The History and Present of Race and Science*

\* Angela Saini, "The Illusionists," and "Black Pills," in *Superior: The Return of Race Science* (Boston: Beacon Press, 2019), 175-220.

***RESPONSE PAPER 3 HANDED OUT***

Week 12

*No Class: Work on Response Paper 3 and Final Paper*

*New Planetary Sciences 1: Ecology*

Bowler and Morus, c9.

***RESPONSE PAPER 3 HANDED IN***

Week 13

*New Planetary Sciences 2: Earth System Science and Climatology*

\* Martin Rudwick, "Global Histories of the Earth," in *Earth's Deep History: How it Was Discovered and Why it Matters* (Chicago: University of Chicago Press, 2016), 235-262.

*Marginal Science, Pseudoscience, and Hoaxes*

\* Michael Gordin, "Introduction: Bad Ideas," and "The Struggle over Lysenkoism," in *The Pseudoscience Wars: Immanuel Velikovsky and the Birth of the Modern Fringe* (Chicago: University of Chicago Press, 2012), 1-30, 83-107.

Week 14

*The Birth of Denialism: Tobacco, Acid Rain, and Climate Change*

\* Naomi Oreskes and Erik M. Conway, "The Denial of Global Warming," in *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (New York: Bloomsbury, 2010), 169-215.

*The Anti-Vaccination Movement, the War on Science, and Dealing with Crisis*

\* Michael Kinch, "Introduction," to *Between Hope and Fear: A History of Vaccines and Human Immunity* (New York: Pegasus, 2019), 1-25.

\* Richard Horton, "Why Were We Not Prepared?" and "Towards the Next Pandemic," in *The COVID-19 Catastrophe: What's Gone Wrong and How to Stop it Happening Again* (Cambridge: Polity Press, 2020), 25-40, 118-127.

Week 15

*Class Discussion and Debate on Denialism, the War on Science, and Crisis (1)*

*Class Discussion and Debate on Denialism, the War on Science, and Crisis (2)*

# GE THEME COURSES

## Overview

Courses that are accepted into the General Education (GE) Themes must meet two sets of Expected Learning Outcomes (ELOs): those common for all GE Themes and one set specific to the content of the Theme. This form begins with the criteria common to all themes and has expandable sections relating to each specific theme.

A course may be accepted into more than one Theme if the ELOs for each theme are met. Courses seeking approval for multiple Themes will complete a submission document for each theme. Courses seeking approval as a 4-credit, Integrative Practices course need to complete a similar submission form for the chosen practice. It may be helpful to consult your Director of Undergraduate Studies or appropriate support staff person as you develop and submit your course.

Please enter text in the boxes to describe how your class will meet the ELOs of the Theme to which it applies. Please use language that is clear and concise and that colleagues outside of your discipline will be able to follow. You are encouraged to refer specifically to the syllabus submitted for the course, since the reviewers will also have that document. Because this document will be used in the course review and approval process, you should be *as specific as possible*, listing concrete activities, specific theories, names of scholars, titles of textbooks etc.

Course subject & number

## General Expectations of All Themes

**GOAL 1: Successful students will analyze an important topic or idea at a more advanced and in-depth level than the foundations.**

**Please briefly identify the ways in which this course represents an advanced study of the focal theme.** In this context, “advanced” refers to courses that are e.g., synthetic, rely on research or cutting-edge findings, or deeply engage with the subject matter, among other possibilities. *(50-500 words)*

Course subject & number

**ELO 1.1 Engage in critical and logical thinking about the topic or idea of the theme.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**ELO 1.2 Engage in an advanced, in-depth, scholarly exploration of the topic or idea of the theme.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course subject & number

**GOAL 2: Successful students will integrate approaches to the theme by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or to work they have done in previous classes and that they anticipate doing in future.**

**ELO 2.1 Identify, describe, and synthesize approaches or experiences as they apply to the theme.**

Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**ELO 2.2 Demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts.**

Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

Course subject & number

Specific Expectations of Courses in Citizenship

**GOAL 1: Successful students will explore and analyze a range of perspectives on local, national, or global citizenship, and apply the knowledge, skills, and dispositions that constitute citizenship.**

**ELO 1.1 Describe and analyze a range of perspectives on what constitutes citizenship and how it differs across political, cultural, national, global, and/or historical communities.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**ELO 1.2 Identify, reflect on, and apply the knowledge, skills and dispositions required for intercultural competence as a global citizen.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)



Course subject & number

**GOAL 2: Successful students will examine notions of justice amidst difference and analyze and critique how these interact with historically and socially constructed ideas of citizenship and membership within societies, both within the US and/or around the world.**

**ELO 2.1 Examine, critique, and evaluate various expressions and implications of diversity, equity, inclusion, and explore a variety of lived experiences.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

**2.2 Analyze and critique the intersection of concepts of justice, difference, citizenship, and how these interact with cultural traditions, structures of power and/or advocacy for social change.** Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)