

HSTR 207CS: Science & Technology in World History

Final Exam Study Guide

The final exam will incorporate material from your readings, the lectures, and our discussions. You should bring a blue book to the exam. We will provide blank sheets of paper for you to organize your thoughts and outline your answers. No notes or books will be allowed.

Sample Essay Questions

Climate Science:

Why is it important to understand the early history of climate science (the work of Eunice Foote, John Tyndall, Joseph Fourier and others)?

How did a new spatial approach to science transform our understanding of the geophysical sciences?

How does the history of climate science exemplify what Harari calls “the marriage of science and empire”?

According to the recent IPCC, what are going to be the geophysical effects of increasing levels of CO₂ in the atmosphere?

We understand the geophysical effects that climate change will have (is having) on the environment. According to our readings and class discussions, what are going to be the broader social and cultural effects of a warming planet?

In Kathy Whitlock’s lecture, how did she go about creating consensus around climate science? What were her greatest hurdles; what have been her successes?

What is the “anthropocene”? What is significant about the concept? How could the concept be dangerous?

According to Kahan, why are we poles apart on climate change?

If our knowledge of climate science is sound and the problem of a changing climate is real and evident, then why haven’t we done something about it?

Modern Biology:

What does Charles Darwin mean when he writes in his “Conclusion” that “we will no longer look at organic beings as savages look at ships”?

What revolutions, and in which fields, does Darwin predict will occur owing to his theory of evolution through natural selection?

Why does Darwin end his *On the Origin of Species* with planets revolving according to the “fixed law of gravity”?

What is Social Darwinism? How does it differ from eugenics?

What is eugenics? How does the history of eugenics help us engage questions in modern biology?

What is sociobiology? In E. O. Wilson's book, *Sociobiology: The New Synthesis*, what does the subtitle mean?

Is there a "religion gene"? How would socio-biologists argue that such a gene obviously exists?

What is reductionism? How is CRISPR/Cas9 a good example of the reductionist program in biology?

Why is Marcy Darnovsky concerned that CRISPR technology will lead to the "emergence of a market-based eugenics"?

In defending gene editing, how does John Harris use the terms "nature" and "natural"?

Describe how CRISPR technology works. How could it be used to help solve the problem of the Zika virus? What, according to critics, are some of the unintended consequences we need to worry about?

What does epigenetic research tell us about how our decisions and environments can impact our children and grandchildren?

What did Blake Wiedenhaupt argue were the most pressing social and ethical considerations surrounding CRISPR research? What does Harari think?

How did Kathy Whitlock and Blake Wiedenhaupt differ in their approach to the social and ethical considerations of the science in which they work?

How does Stephen Johnson's *Invention of Air* help us think about modern climate science and modern biology?

Harari:

According to Harari, are we happier? What does history have to do with that?

Harari begins his last chapter by stating, "This book began by presenting history as the next stage in the continuum of physics to chemistry to biology." What does he mean? How does he end his book?

According to Harari, how are we breaking away from natural selection and replacing it by intelligent design? What does he think about that? What do you think about that?

Give examples of the various connections between science and society (history of science), and between nature and culture (environmental history) that we have discussed in this class, and explain how they help us engage contemporary questions in science and technology.