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 seeing 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.

Accessibility

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Course subject & number History 2701

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 t

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)*

Today ' s lived environment is predominantly technological. We spend our lives inside and we are continually tethered to vast technological systems which are increasingly global in extent. We move around in cars and communicate via iPhones and computers. Practically everything we do is mediated by technology. This is not a novel phenomenon, although the scale, interconnectedness and materiality of technological environments has been historically highly variable. This course provides a sweeping history of the development of our technological environment from the use of fire and stone tools through to today ' s planetary technosphere. The technosphere is a relatively novel concept. It refers to the sum total of all human technologies and argues that these have assumed sufficient scale to act as a planetary force, like the geosphere and biosphere.
Through lectures, class discussions, and five response papers, students are introduced to this history. They are also introduced to the fact that the history of technology is not a straightforward history of progress, of inventive humans increasingly bringing nature under control and of life getting better and better. Instead, students are encouraged to view the history of technology in terms of complexity, unpredictability, and unintended consequences.

The course begins by introducing students to some advanced concepts which all historians (and sociologists, anthropologists and philosophers) of technology use: technological determinism, social construction, technological momentum, systems theory, unintended consequences, and material agency. It reinforces these concepts in every lecture. Students also learn that all human societies, even very ancient ones, have been " technological " and that the human environment has never been entirely or purely natural or unmodified. The idea of an " untechnological " society or environment is entirely misleading.

This methodological framework involves working with complex concepts, and means that students are analyzing the topic in a more advanced way than they would at a foundational level course.
The class is organized into 5 modules:
1. The deep history of technology from 3.3 million years ago to the seventeenth century
2. The industrial revolution and large technological systems
3. The history of energy and its alternative forms
4. Technologies of everyday life
5. Computing, communication, and the technosphere

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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)

The first lecture of the class introduces students to the basic dichotomy between technological determinism and social construction in the study of technology. The former argues that technology effectively shapes or determines society, and drives history, while the latter argues, in contrast, the technology is always a social product, shaped by cultural and political interests. Students are introduced to these ideas through David Nye ' s accessible work Technology Matters. They are also introduced to other concepts – Thomas Hughes ' s idea of technological momentum and Bruno Latour ' s actor-network theory. All of these concepts are designed to encourage a critical view of technology and technological environments, which regards nothing as inevitable and hence, potentially, open to change. It is vitally important to disavow students of the idea of inevitable process and the idea that technological change happens without contestation.

The remainder of the course, and all written and discussion work, reinforces these concepts. For example, the first module explores the formation of technological environments in the Paleolithic, in ancient and medieval Asia and Europe, and in early modern Europe. In all these lectures and classes, the concepts are put to work and explored. For example, our discussion of medieval technology includes the famous " stirrup thesis " of Lynn White Jr., who argued that the stirrup, by enabling " mounted shock combat " determined the rise of a knightly class and thus determined the feudal system. Students read the critical chapter of his famous work, Medieval Technology and Social Change in week three. This classic example of technological determinism is used for the basis of a lecture and class discussion on the relationship between technology and the medieval social and industrial order, from feudalism to windmills and textile production. But this also introduces a very important idea: that small and seemingly inconsequential technologies can used as the centrepiece of massive historical theses. In discussing the early modern world, the printing press is often viewed as " determining " transformation and " causing " the Reformation and the Scientific Revolution. This extremely simplistic view is taken apart in class.

The first response paper then gives students the chance to further develop their critical and logical thinking about the history of technology and technological environments.

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)*

Students produce five separate response exercises in this class, one for each module. All response papers offer a choice of questions, with the exception of module 4, which asks the single question " why did the electric car lose out to the internal combustion engine in the early 20th century? Do you think the situation is different today and if so, why? " This question explicitly asks them to consider the range of factors outlined by the Dutch historian Gijs Mom in his book The Electric Vehicle. These include social construction arguments (e.g. that the idea of a single-purpose vehicle capable of long and short trips is a social construction, or the idea that the electric vehicle was (and perhaps still is) gendered as female) and technologically-determinist ones (such as the argument that the electric vehicle essentially failed because of the battery). Students write a scholarly, 4 – 5-page paper on the subject, engaging with key course concepts.

The other response papers give students a choice of questions. Again, their answers are in-depth, scholarly ones.

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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)*

The final module is structured around discussions of the history and present two critical technological "lived environments": digital media (an immersive media ecology) and the technosphere (the latter being technology considered as a giant, planet-spanning system). Material here includes the long-term history of information systems. Students read key text on digital media and the technosphere, for example by the renowned anthropologist Sherry Turkle and the eminent earth scientist Jan Zalasciewicz. This module is obviously interdisciplinary in nature and should connect with material students have encountered in other classes.

Students are expected to prepare responses to precirculated questions which respond to the readings and invite them to consider their own technological moment in the light of the deep history of technology that they have just studied.

The aim of this discussion is to help the students evaluate whether or not their own technologies are radical and revolutionary, and if so, to what extend they are shaping (or even determining) our experience. Students are thus invited to consider whether ideas of technological determinism can contribute to an overly pessimistic (or utopian) view of contemporary technology or whether we can trace continuities with the past. Given our emphasis on unintended consequences, students are discouraged from seeing the future in any kind of straightforwardly linear fashion, but the aim here is to equip students with the life skills to think about the place of technology in their world.

Following the discussion, students produce a shortish (4-5 pages) final response paper on either digital media or the technosphere. In this paper, they briefly situate our present moment in the deeper history of communication or large technological systems. They then assess this moment in terms of the theories and concepts discussed in the class. Here, they particularly focus on whether or not technology is, finally, "out of control" and dominating human existence. They then offer tentative speculations on what the future might hold. This exercise is more speculative than the previous response papers, and invites students to connect their learning with out-of-classroom experience and work from other classes (e.g. in engineering, anthropology, earth system science, communication, or ecology).

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)*

This ELO is fulfilled in two ways. First, in week ten, a class discussion and completed questionnaire will invite students to reflect on what the most significant things they have learned from the class, and also to reflect on to what extent their view of our technological environment and technology itself has changed as a result of the course. Second, the final discussion is essentially a reflective and self-assessment exercise, in which students apply the various concepts and lessons they have learned from the class to their own lived environment – an environment of smartphones, digital media, and fossil-fuel powered technologies.

Course subject & number History 2701

Specific Expectations of Courses in Lived Environments

GOAL 1: Successful students will explore a range of perspectives on the interactions and impacts between humans and one or more types of environment (e.g. agricultural, built, cultural, economic, intellectual, natural) in which humans live.

ELO 1.1 Engage with the complexity and uncertainty of human-environment interactions. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

The course charts the history of Homo sapiens emerged as a unique type of worldmaker, capable of creating and using tools, controlling fire, building cities, tapping into fossil fuel reserves and assembling vast, planet-spanning systems. Students are invited to explore ways in which these artifacts and systems have increased in complexity throughout history, and how they have generated uncertainties and instabilities. The course thus explores the complexity of human-environment relations through the history of those technologies, and the creation of what Marx called a "second nature" of human-built systems.
The second module, in particular, addresses complexity and certainty by exploring how large technological systems (railways, electricity grids, highway networks, and so on) created new possibilities and new complexities. Students are introduced to the concept of "Large Technological Systems" – large-scale technologies extending over vast tracts of space with many components and subcomponents. They explore the ways in which such complex technologies produced unintended consequences, like air pollution, global warming, and novel forms of risk and accident. They debate the extent to which Homo sapiens became locked into huge technologies which threatened new forms of technological determinism.
One key lecture here comes in week six, when we explore Charles Perrow's seminal idea of "normal accidents." This theory states that large technological systems are ultimately impossible to fully control and predict, and hence inevitably generate risk and accidents. We explore this concept in class through analysis and discussion of infamous technological accidents such as Three Mile Island, Chernobyl, and Bhopal. This lecture is followed by one on war and large technological systems, which particularly focuses on World War One as the first truly industrial war, and on nuclear weapons as the ultimate example of the risks in an industrial age. Students here explore the rhetoric of technological determinism surrounding nuclear weapons.
Students then develop these themes and ideas in their second response paper, which invites them to consider questions such as "what is a large technological system? Give one historical example. In what ways did this system introduce new elements of complexity and uncertainty into human-environment relations?"

ELO 1.2 Describe examples of human interaction with and impact on environmental change and transformation over time and across space. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

This ELO is basically the focus of the whole course. I will give a couple of examples here from the early part of the course. The second lecture explores the technologies of deep human history. Through a study and discussion of stone tools (particularly handaxes) and fire, students will develop insights into how Homo sapiens and earlier hominins began transforming their environments in radically new ways. The use of fire, for example, had enormous consequences for things like land clearance and agriculture. These innovations also, critically, transformed the human brain. Hominins did not develop a big brain and remarkable capacities for tool-manipulation and then develop tools. They developed these aptitudes through their engagement in the world. By using fire to cook food, for example, humans radically altered their own bodies: such "predigestion" allowed a greater energy expenditure in the human brain.
The entire fourth model is focused on how and why western and global society shifted to fossil fuels, and particularly oil. The critical lecture here is on the electric vehicle. Students learn that electric vehicles were popular and commonplace in 1900, and that they were often quite fast and reliable. The triumph of the internal combustion engine was in no way preordained by the nature of technology itself. Instead, our lectures and class readings show that a wide array of factors led to the hegemony of the internal combustion engine, including factors of gender (relating to masculinity as well as femininity), infrastructure-building, ideas of what a car should be and do, and wartime experience.
Students then write a response paper in which they assess how and why we came to be hooked on oil. This enables them to understand how human choices have led to massive environmental transformations, and that other pathways were, and are, possible. It is vital for them to understand how human-environment interactions are historically specific and never preordained. This is a hopeful point and one I hope students take to heart.

Course subject & number History 2701

GOAL 2: Successful students will analyze a variety of perceptions, representations and/or discourses about environments and humans within them.

ELO 2.1 Analyze how humans' interactions with their environments shape or have shaped attitudes, beliefs, values and behaviors. Please link this ELO to the course goals and topics and indicate *specific* activities/ assignments through which it will be met. *(50-700 words)*

One key and problematic attitude to the environment is extractionism: the belief that humans should extract as much material as possible from the earth, primarily for sale in a capitalist world. The theme of extractionism is central to modules 2, 4 and 5. Large technological systems required not only vast amounts of metals and fuel, but they also required extractionism to be valued and normalized. The normalization of extractionism is explored in lectures on railways, new materials, and cars. For example, in week five, students read Vaclav Smil ' s work on novel materials, which is developed in a lecture on plastics, synthetics, and light metals. This lecture outlines ways in which new materials and new technologies drove humans towards hyper-extractive activities in the twentieth century. The more hi-tech gadgets are consumed, the more extractionism becomes essential. However, as the lecture reveals, this process also generated backlash and resistance, such as the contemporary movement to control plastic pollution. Students thus learn how multiple, contradictory forms of belief are generated by the same process of environmental interaction.
During the final lecture (and discussion) on the technosphere, students are asked to consider how our interaction with the environment over the long term has produced two contradictory ideas: first, the idea that we can effectively technologize our entire planet and steer it as we would any other piece of technology; and second, the idea that we have entirely destroyed the " natural " world and replaced it with something synthetic. These are optimistic and pessimistic viewpoints, but again, they allow students to analyze how long-term interactions with the environment have shaped human attitudes, values, and beliefs.
Again, students have the opportunity to develop these points further in response papers 2 and 5.

ELO 2.2 Describe how humans perceive and represent the environments with which they interact. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

This ELO is fulfilled in two ways. First, our discussions and readings also address questions of how technological environments have been perceived and represented. This is perhaps most explicitly discussed in module 2, when we devote considerable time to Lewis Mumford ' s Technics and Civilization, a book that provides a critical, and quite romantic, view of the industrial revolution as producing an ugly, utilitarian environment, overhung with pollution. This position is juxtaposed by David Nye ' s idea of the technological sublime: the aesthetic awe that can be inspired by technologies that mark a radical break with the natural order. We devote considerable time in class to the aesthetics of the early steam railway here.

Second, we also explore how technologies themselves have changed perceptions of the environment. Again, the railway is a classic example. Students read and discuss Wolfgang Schivelbusch ' s classic text The Railway Journey, and then discuss his concept of " panoramic perception " in class. This is the idea that the speed and smoothness of the railway created the conditions of possibility of a new and detached way of perceiving landscape as something distant. These themes are also explored in the later lecture on the car.

Students will also have the opportunity to discuss such issues in their second response paper on either the Industrial Revolution or steam railways.

Course subject & number History 2701

ELO 2.3 Analyze and critique conventions, theories, and ideologies that influence discourses around environments. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

The ideologies surrounding technological and social environments are explored in the fourth module, on technologies and everyday life. Here, we focus particularly on how gender and race are not simply socially constructed, but physically constructed through technology. For example, the lecture on technologies of the household, and how domestic technologies have been integral to the formation of the idea of the woman as homemaker, effectively trapped in the private sphere. This has become normalized in the west over the past two centuries. It is implicit in the way our homes are built and in the types of machines we use in them. This lecture is built around Ruth Schwartz Cowan ' s More Work for Mother, which argued that domestic technologies have not liberated women (as many adverts for vacuum cleaners and refrigerators suggested). This lecture is followed by a complementary one on technologies of the workplace. It explores how certain everyday technologies have become associated with men. Our particular case study here is computing. Mar Hicks ' s Programmed Inequality is the key reading here, which shows how women ' s early gains in the British computer industry were soon overturned because of patriarchal ideas about intelligence and the capacity to utilize complex machines. This lecture also informs students of the forgotten history of World War Two female codebreakers.
These lectures are probably the clearest examples of how social construction is a powerful tool in rethinking and critiquing norms of everyday life, such as the idea that men handle big and powerful machines while women sew and cook. These ideas are reinforced in the response paper for this module, which invites students to reflect on how gender and race are technologically and environmentally assembled.