Dietrich College Freshman Seminars
Fall 2017

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<td>66-161 / 16-161</td>
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<td>Edward Kennedy</td>
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66-109 / 39-109, Grand Challenge Interdisciplinary Freshman Seminar: Climate Change
Climate change is considered by many the most serious social, political, and environmental issue of the 21st century. As human activities increase the level of greenhouse gases in the atmosphere, scientists have established the reality of climate change and have estimated its impacts on human society and the natural world. Despite the scientific consensus on its existence, causes, and consequences, a substantial number of Americans and citizens of other countries still question these conclusions and a small but vocal group of doubters continue to challenge the science and scientific consensus on climate change. In spite of some social division over these issues, governments at local, national, and international levels have made concerted efforts to craft policies to address climate change. These policies have shifted over time as the information, attitudes, and technology associated with climate change have evolved. In this course, we will explore the challenges and complexities of climate change by investigating the subject from a variety of angles: scientific, political, rhetorical, cultural, economic, technological, and ethical. Over the course of the semester, we'll inquire: What is climate change? How do scientists know it is happening? Why is there public debate over it? What solutions are available? And what are the pros and cons of the different solutions?

66-161 / 16-161, Grand Challenge Interdisciplinary Freshman Seminar: Artificial Intelligence and Humanity
In 1965 British mathematician I.J. Good wrote, “An ultraintelligent machine could design even better machines; there would then unquestionably be an ‘intelligence explosion,’ and the intelligence of man would be left far behind.” As we enter an age where companies like Uber are testing driverless cars in Pittsburgh and innovative interfaces like IBM’s Watson can play jeopardy and learn techniques for medical diagnoses, how are we to negotiate an ‘intelligence explosion’ that for many individuals might threaten the very notions of what it means to be human? The future of human-to-
machine relationships will likely define our historical epoch and yet, many young technologists and humanists underestimate the downstream impact of technological innovations on human society. Presently, we have little choice but to attend to this rapidly anxiety-ridden question. This seminar will attend to the challenge of present existential questions on what it means to be human (read not machine) in the context of a rapidly advancing technological age. We will consider human narratives throughout history that exam how governments and individual citizens defined humanity in the context of slavery and colonialism as a framework for exploring and projecting what it means to be human in the age of rapidly advancing ‘intelligent’ machines. We will trace the technological advancements of the recent five decades and identify historical precedents and speculative narratives that help us to consider issues like labor, economic disparity, negotiations of power, human dignity and ethical responsibility within the context of human relations with advancing technological tools that are now coined, artificial intelligence.

66-102, Dietrich College Freshman Seminar: Issues in American Environmental History
This seminar will focus on major issues in the evolution of the American environment. Much of America’s past environmental history has been beset with controversy, as scientists and engineers, health officials, politicians and the public debated about the cause and solution for various environmental problems. This seminar will examine some of the major environmental issues that have evolved over time through a combination of reading, discussion, and short papers. Where ever possible, comparisons will be made with conditions in other parts of the world.

66-103, Dietrich College Freshman Seminar: The Social Impact of War (for HSP only)
Wars and their effects are a continuing aspect of the human condition. This course will introduce students to the manner in which war is conceptualized in modern western societies, using readings from philosophy, literature, history and the social sciences to examine how warriors, belligerent societies and cultures describe the benefits and costs of war. The course will primarily focus on the American experience of war in the twentieth and twentieth-first century, from the Great War to the War on Terror, while also examining the Cold War and the antecedents to contemporary conflict.

This class fulfills the Freshman Seminar requirement for General Education requirements.

66-104, Dietrich College Freshman Seminar: Philosophy and Argument
What makes me “me”? What is real? Is there a God? What is the mind, and how does it interact with the body? Can computers think? Are humans ultimately free? What makes our lives valuable? Should we try to make ourselves immortal? What should we do about climate change? These are some of the toughest, most pressing questions in philosophy today. Philosophers have addressed these questions by producing subtle, intricate, and often beautiful arguments. In this seminar, you will assess those arguments and produce your own. You will learn to think like a philosopher — to strip an argument presented in prose to its bare essentials and produce a visual representation that displays its structure plainly. Learning to visualize arguments in this way will improve the clarity and rigor of your own thinking and writing. It will put you in a position to make progress on hard questions such as those above. And it will improve your ability to crisply convey your ideas—an ability that will serve you well not just in your Carnegie Mellon classes, but also in the political, professional, and civic reasoning you employ for the rest of your life.

66-105, Dietrich College Freshman Seminar: Scientific Thinking: in Children, in Adults, and in Scientists
The aim of this course for you to learn how to provide a coherent answer to the question: “What does it mean to ‘do’ science”? You will discover that the answer depends on being able to define “the scientific method” and “scientific knowledge”. We will sample — a very tiny part of -- the vast literature on Science. This will involve reading selected papers about scientific reasoning, creativity, invention, and discovery. You will learn something about what philosophers, historians, sociologists have written about how science is done, and you will also see what scientists themselves have to say about the matter.
In one part of the course, we will read selected topics from a standard textbook on thinking and problem solving. You will have a chance to do some psychology research of your own that reveals how people go about forming hypotheses and designing experiments to test them. In addition, we will look at studies and research papers about the cognitive psychology of science, and you will read several “primary sources”: articles from journals in cognitive psychology that deal with the psychology of scientific reasoning.

Finally, we will spend some time learning about research on teaching science in the early grades, and examine some of the current controversies about science.

66-106, Dietrich College Freshman Seminar (for QSSS only)
The QSSS Freshman Seminar provides a fast-paced introduction to a range of methods in the quantitative social sciences. Organized around a set of case studies, the course introduces students to concepts from each of the six QSSS concentration areas: statistics and regression, econometrics, choice modeling, quantitative policy analysis, computational modeling, and psychometrics.

66-107, Dietrich College Freshman Seminar: Modeling Complex Systems
Most of the major issues confronting humanity—such as climate change, financial collapse, ecosystem survival, terrorism, and disease epidemics—are the result of complex systems where the interactions of the pieces of the system create a whole that is rather different than any of its parts. Unfortunately, traditional scientific methods that focus on reducing systems to their parts and then analyzing each part provide little insight into such systems. This seminar explores the behavior of complex systems as well as how to model and understand them using both traditional tools and computer-based approaches.

66-108, Dietrich College Freshman Seminar: Statistical Paradoxes: When You Can’t Trust Your Own Eyes
Humans are notoriously bad at probabilistic thinking. We’re crushed if our hometown team loses when it’s the favorite, and ecstatic when we go on a lucky streak playing craps: we constantly see patterns in randomness. Even Paul Erdos, one of the greatest mathematicians of the last few centuries, was famously wrong about a deceptively simple probability puzzle. When it comes to statistics, we often run into trouble when we rely on intuition—we can’t trust our own eyes. In this class we will tease apart some entertaining but important statistical paradoxes and biases. For example: Why are better health outcomes reported when only medical screening improves? How could David Justice have a better batting average than Derek Jeter in both 1995 and 1996 separately, but not in 1995-1996 combined? Could most published research findings actually be false? Why should attorneys be forced to learn Bayes’ Theorem? Can we really know that smoking causes lung cancer? This course will help you answer these questions, teach you to think critically about research and news reports, or at least give you some entertaining anecdotes to tell at parties. We will also use the statistical software R for hands-on exploration.
# Dietrich College Freshman Seminars

## Spring 2018

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<td>66-112</td>
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### 66-110, Grand Challenge Interdisciplinary Freshman Seminar: Capitalism, Culture and Inequality

*Description to come*

### 66-111, Gender-Based Violence

Gender Based Violence (GBV) is a global health & human rights crisis in which, according to the World Health Organization, one in every three women has been beaten, coerced into sex, or abused. Discourse surrounding GBV enters into the sacred space of the home, the strategies of advertisers, the halls of the Senate, college campuses, and the galleries of the world’s most well known museums. It is, literally, everywhere.

Although it is everywhere, wide spread, and catastrophic, GBV is often minimized, concealed, and dismissed. This course will explore the many manifestations of GBV, from stalking to human trafficking, removing it from the shadows and bringing it into the open so that we can do something about it. Toward that end, we’ll simultaneously explore the many creative ways people are combatting this global epidemic. Throughout our work, we’ll explore how gender based violence intersects with multiple, overlapping systems of oppression—from race to heteronormativity. Finally, you’ll imaginatively develop your own resistance strategies through a culminating, group project.

### 66-112, Mathematical Thought from Euclid to Cantor

**Instructor: Jeremy Avigad**

Description: Mathematics and philosophy have been intertwined since ancient times, and philosophers have long been engaged in the project of explaining what it is that makes mathematical knowledge special. In this seminar, we will consider three important periods in the development of mathematics, and associated philosophical reflection. Specifically, we will study Euclid’s theory of geometry, and its impact on Plato and Aristotle; Newton’s invention of the calculus, and its impact on
early modern philosophers; and Cantor’s theory of the infinite, and its impact on early analytic
philosophy.

**66-113, The Neuroscience and Psychology of Everyday Life**

**Instructor: Lori Holt**

A lot goes on ‘behind the scenes’ in everyday activities like listening to music, studying for an exam, or recognizing a friend across campus. In this course, we will go behind the scenes to examine the neuroscience and psychology of the behaviors of everyday life.

You will become acquainted with research and theory at the intersection of psychology and neuroscience, at levels from molecular to cognitive. Along the way, you will learn to separate fact from fiction and to evaluate media claims about the mind and brain. You will learn what cognitive and neural sciences have to say about practical matters like making good work habits and studying efficiently.

Throughout the course, there will be an emphasis on critical thinking and application of what you are learning. You can expect connections to pop culture, media and current events as we connect cutting-edge research with topics relevant to everyday life.

The course is open to all freshman, both science and non-science majors.

**66-114, Grand Challenge Interdisciplinary Freshman Seminar: Racism**

Racism is everywhere in the twenty-first century. In August 2009, the renowned Indian actor, Sharukh Khan, was detained at Newark International Airport. According to Khan, his Muslim surname led American immigration officials to question him about the nature of his visit for over two hours. Was his treatment racist? In 2011, Luis Suarez a Uruguayan soccer player was punished for allegedly calling French footballer Patrice Evra “negro” in England. But was the word “negro,” said in Spanish, racist?

Racism is a complex phenomenon that refers to historically hierarchical power differences between groups (e.g. Native populations and Europeans during the conquest), ideas about how humans can be classified into groups by “race,” and also discriminatory practices against non-dominant groups. This system of social relations and ideology serves to justify social inequality and differential treatment. If we are to end racism, we must strive to understand it. What are the historical origins of racism? How is racism reproduced? How does race influence identity formation? Can racism produce positive identities? Why has the struggle against racism shifted from a demand for human rights to a search for diversity and inclusion?

This course will examine racism in Pittsburgh, in the United States, and in several other countries and regions throughout the world. We will approach racism from multiple academic perspectives with a team of three faculty from the departments of History, English and Modern Languages. This team-based interdisciplinary approach to Freshman Seminars draws on several departments and guest speakers.

**66-115 Freshman Seminar in Economics**

*Description to come*

**66-116 Freshman Seminar in Statistics**

*Description to come*