Spring 2016 Courses

The Universe – AST203

Christopher Chyba (with David Spergel and Anatoly Spitkovsky)

This specially designed course targets the frontier of modern astrophysics. Subjects include the planets of our solar system, the birth, life, and death of stars; the search for extrasolar planets and extraterrestrial life; the zoo of galaxies from dwarfs to giants, from starbursts to quasars; dark matter and the large-scale structure of the universe; Einstein's special and general theory of relativity, black holes, neutron stars, and big bang cosmology. This course is designed for the non-science major and has no prerequisites past high school algebra and geometry. High school physics would be useful.

PhD Gateway in Security Studies – WWS550

Christopher Chyba (with Aaron Friedberg and Jacob Shapiro)

The field of Security Studies is distinguished by its focus on a clearly delineated set of intellectual and practical problems. This course will serve as the required gateway for all students entering the Woodrow Wilson School.

Unmaking the Bomb: The Science & Technology of Nuclear Nonproliferation, Disarmament, and Verification – MAE354

Alexander Glaser

This course covers the science and technology underlying existing and emerging nuclear security issues. Part I introduces the principles of nuclear fission, nuclear radiation, and nuclear weapons (and their effects). Part II develops the concepts required to model and analyze nuclear systems, including the production of fissile materials and the detection and characterization of these materials with radiation measurement techniques. Relevant applications are explored in Part III and include nuclear forensic analysis, nuclear archaeology, and nuclear warhead verification. Such case studies will also be part of the final projects.

Mitigating Climate Change – WRI101

M. V. Ramana

Around the world, concern about global warming is increasing as carbon dioxide emissions accelerate, and extreme weather events become more frequent. Climate change, in the words of President Barack Obama, is “the global threat of our time”. Reflecting widespread consensus, UN secretary general Ban Ki-Moon declared in 2013, “we know the nature of the problem, and the options for addressing it”. If
this is the case, why have efforts to mitigate climate change failed so far? This Writing Seminar will investigate proposed approaches to mitigating climate change to better understand the nature of the problem. We begin by analyzing a recent document submitted to the UN Framework Convention on Climate Change within the context of international equity. Next we critically evaluate the social and political implications of one proposed, controversial, solution: capturing the carbon dioxide emitted by coal and natural gas plants and burying it underground, using theoretical understandings of the properties of the underlying economic system and the politics of technologies. For the research essay, students will interrogate this ongoing debate about different aspects of climate change using disciplinary lenses or in an interdisciplinary fashion, exploring how the problem or its consequence is conceived or how potential solutions are formulated.

Hogs, Bats, and Ebola: An Introduction to One Health Policy – FRS120

Laura H. Kahn

This interdisciplinary seminar will cover subjects such as basic epidemiology, public health and policy, history of food safety and security, history of meat production and consumption in the 20th century, essentials of zoonotic diseases, the politics of antibiotic resistance, and the national and international organizations that oversee health and agriculture. A series of disease outbreaks will be discussed and analyzed including Severe Acute Respiratory Syndrome (SARS), avian influenza, Nipah virus, Q fever, and the Ebola virus.