CAP LECTURE LIST

Fall 2020

Princeton University
Office of Community and Regional Affairs
Community Auditing Program (CAP)
4 Mercer Street
Princeton, NJ 08540
Telephone (609)258-0202

Email: PUCAP@princeton.edu

Website: https://community.princeton.edu
• Fall Class Fee $200 per course, per semester. Auditor Only Series $125 per course. Credit card accepted (Visa, MasterCard, and Discover). We Do NOT accept American Express.
• To receive a refund when dropping a course, you must notify the CAP office in writing (email acceptable) on or before Thursday, September 9, 2020 by 5:00 pm.
• Registration on Day 1 and Day 2 is limited to one (1) course. Day 3 is limited to three (3) courses.
• Auditors may register for 3 University classes plus the Auditor Only class.

Wednesday, August 26, 2020
• Home/Off-site online registration: opens at 11 a.m. – Day 1 ends on 8/27/2020 at 10:30 am
  Day 1 Activated auditors only, one course limit
• In-person onsite registration is not available at this time.

Thursday, August 27, 2020
• Home/Off-site online registration: opens at 11 a.m. – Day 2 ends on 8/28/2020 at 10:30 am Day 2 Activated auditors only, one course limit
• In-person onsite registration is not available at this time.

Friday, August 28, 2020
• Home/Off-site online registration: opens at 11 a.m. – for all activated auditors
• In-person onsite registration is not available at this time.

Friday, August 28 – Tuesday, September 15, 2020
Registration remains open for all auditors online through the first two (2) weeks of classes for courses with space available.

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AUDITOR ONLY SERIES

ASC100 Contemporary Science Fiction
Professor: Alfred Bendixon, Lecturer in English

Description: An exploration of the variety, diversity, and power of recent science fiction through the study of four recent critically acclaimed and best-selling novels:

In Justina Ireland’s *Dread Nation* (2018), the Zombie Apocalypse occurs during the Battle of Gettysburg and our young protagonist has to navigate racial, social, and political hierarchies to survive this pandemic. Alternate history assumes a different form in Mary Robinette Kowal’s *The Calculating Stars* (2018), which won the Nebula, Hugo, and Locus awards for best novel. Kowal’s narrative of the first Lady Astronaut reimagines a space program in which women earn an important place in a nation devastated by a meteor strike. Naomi Alderman’s *The Power* (2017) shows a world turned upside down when women acquire the electrifying power. The classic adventure form of space opera moves into new dimensions with the brilliant character studies in Becky Chambers’s *The Long Way to a Small Angry Planet* (2015), the first volume in the Wayfarers series which recently won the Hugo award for best series.

These four novels exemplify the ways in which recent works of speculative fiction have engaged the most pressing issues of our time in a variety of imaginative ways.

October 9, 2020: Justina Ireland, *Dread Nation* (zombie pandemic, slavery and racism).


November 6, 2020: Naomi Alderman, *The Power*: (the most intriguing feminist s/f novel of our time).


Time: 10:00-11:30 am

Dates: October 9, 23, November 6, 20, 2020

Alfred Bendixen received his Ph.D. in 1979 from the University of North Carolina and taught at Barnard College, California State University, Los Angeles, and Texas A&M University before joining the Princeton faculty in 2014. Much of his scholarship has been devoted to the recovery of 19th-century texts, particularly by women writers, and to the exploration of neglected genres, including the ghost story, detective fiction, science fiction, and travel writing. His teaching interests include the entire range of American literature as well as courses in science fiction, graphic narrative, and gender studies.
Professor Bendixen may be best known as the founder of the American Literature Association, the most important scholarly organization in his field, which he continues to serve as Executive Director and as a frequent director of its national conferences.

ASC 200 – Behind the Scenes, Beyond the Script

**Professor:** Debbie Bisno, Resident Producer, McCarter Theater

**Description:** Join us for a Lunch and Learn!

What does it mean to be an **artist** or a **theatrical producer** in a COVID world? Peek into the lives and careers of established and award winning theater professionals amidst the backdrop of halted productions, commissions-in-progress, rehearsals relegated to ZOOM, and suspended Broadway shows.

Live performance is in limbo, and the entertainment industry is facing its greatest challenge – pivoting and reinventing how to create and deliver content, and how to connect with an audience.

Grab your lunch and dive into a conversation about theatrical work and the performing arts in this moment – what’s happening in the world of “virtual performance” from the artists’ and the critics’ POV, and what the future holds for creative professionals in both the non-profit and commercial sectors.

You’ll have an opportunity to read a play script, hear music demos composed in quarantine, view a theatrical budget/or Broadway Tour schedule, explore virtual performance/experimentation, and engage with a range of special guests & established artists and industry leaders working in stage & film (ie. an actor, director, designer, playwright, composer, agent, Broadway & West End/London producer, a journalist.)

**Bring your lunch! The artists will too!**

**Time:** 1:00-2:30 pm

**Dates:** October 2, 16, 30, and November 13, 2020

Debbie Bisno (Resident Producer) joined McCarter in 2016. Her experience spans Broadway, Off-Broadway, West End, regional and nonprofit theater. Broadway highlights include the 2019 revival of Terrence McNally’s *Frankie and Johnny in the Clair de Lune* starring Audra McDonald and Michael Shannon. Other Broadway: *Grace, War Horse, HAIR, Merchant of Venice, Annie, Priscilla Queen of the Desert*. Off-Broadway and London: Ingmar Bergman’s *Through a Glass Darkly* starring Carey Mulligan, *Passion Play*, and *Merrily We Roll Along*. Debbie was Founder and Producing Artistic Director of Chicago’s Roadworks Productions with residencies at Steppenwolf and Victory Gardens theaters, producing over 20 Midwest and World Premieres by playwrights including Mike Leigh, Kenneth Lonergan, Chuck Mee, Eric Bogosian, Phyllis Nagy, and more. She’s an Advisory Member of NYC’s Playwrights Realm and on the Board of FASPE (Fellowships at Auschwitz for the Study of Professional Ethics). Debbie lives in Princeton with her husband David and their Portuguese Water Dog, Bernice.
AFRICAN AMERICAN STUDIES

African American History Since Emancipation
AAS 367
Professor: Guild, Joshua B.

Description: This lecture offers an introduction to the major themes, critical questions, and pivotal moments in post-emancipation African American history. It traces the social, political, cultural, intellectual, and legal contours of the black experience in the United States from Reconstruction to the rise of Jim Crow, through the World Wars, Depression, and the Great Migrations, to the long civil rights era and the contemporary period of racial politics. Using a wide variety of texts, images, and creative works, the course situates African American history within broader national and international contexts.

Schedule: 11:00 AM - 11:50 AM T TH

PROGRAM IN AMERICAN STUDIES

America Then and Now
AMS 101
Professor: Fernández-Kelly, Patricia, Gleason, William Albert, Valenzuela, Ali Adam

Description: An introduction to the interdisciplinary field of American Studies. Employing history, theater, law, and politics, and focusing on such critical concepts as "community," "xenophobia," and "race," we will consider the structures of knowing and feeling that have formed America since its founding. Throughout the course, we will pay special attention to the ways that culture and difference have shaped, and continue to shape, the signature ideas and debates that have made the nation what it is today. In Fall 2020, we will be particularly interested in the political, social, and cultural questions that inform the current U.S. presidential election.

Schedule: 01:30 PM - 02:50 PM M

ARCHITECTURE

Introduction to Architectural Thinking
ARC 203
Professor: Allen, Stanley T.

Description: The objective of this course is to provide a broad overview of the discipline of architecture: its history, theories, methodologies; its manners of thinking and working. Rather than a chronological survey, the course will be organized thematically, with examples drawn from a range of historical periods as well as contemporary practice. Through lectures, readings, and discussions every student will acquire a working knowledge of key texts, buildings and architectural concepts.

Other Information: Architectural thinking will be explored thematically by focusing upon a series of significant debates (historical and contemporary) about tectonics, program, representation, and urbanism. Debates will include history versus utopia, handcrafted versus machine made, generic versus iconic, form versus program, drawing versus scripting, and image versus surface, among others.
ART AND ARCHAEOLOGY

**Intro to History of Art: Visual Arts**
ART 100
**Professor:** Kitzinger, Beatrice Ellen

**Description:** Introduction to the history of art and to the discipline of art history. Not a comprehensive survey but a sampling of arts -- painting, sculpture, architecture, photography and prints -- and artistic practices from diverse historical periods, regions, and cultures. The course balances consideration of historical developments with attention to individual works of art. Faculty members of the Department of Art and Archaeology lecture in their fields of expertise; all precepts are held in the Princeton University Art Museum to facilitate direct engagement with works of art.

**Schedule:** pre-recorded lectures

**Neoclassicism through Impressionism**
ART 212
**Professor:** Alsdorf, Bridget A.

**Description:** A broad study of European painting and sculpture from the French revolution to 1900 with special attention to social, political, and cultural shifts. Precepts in the Princeton University Art Museum. Lectures explore a range of themes including art and revolution, imperial conquest, the rise of landscape painting, the politics of the nude, the birth of "modernism" and the avant-garde. Emphasis on major figures including David, Canova, Goya, Vigée-Lebrun, Turner, Courbet, Manet, Monet, Degas, Rodin, van Gogh and Cézanne.

**Schedule:** pre-recorded lectures

ASTROPHYSICAL SCIENCES

**Life in the Universe**
AST 255
**Professors:** Chyba, Christopher F., Hecht, Michael H., Onstott, Tullis C., Turner, Edwin Lewis

**Description:** This course introduces students to a new field, Astrobiology, where scientists trained in biology, chemistry, astrophysics and geology combine their skills to investigate life's origins and to seek extraterrestrial life. Topics include: the origin of life on earth, the prospects of life on Mars, Europa, Titan, Enceladues and extra-solar planets, as well as the cosmological setting for life and the prospects for SETI. 255 is the core course for the planets and life certificate.

**Schedule:** 01:30 PM - 02:50 PM M W

CHEMICAL AND BIOLOGICAL ENGINEERING

**Polymers**
CBE 415  
**Professor:** Register, Richard Alan  

**Description:** Broad introduction to polymer science and technology, including polymer chemistry (major synthetic routes to polymers), polymer physics (solution and melt behavior, solid-state morphology and properties), and polymer engineering (overview of reaction engineering and melt processing methods).

**Schedule:** 11:00 AM - 12:20 PM T TH

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**CIVIL AND ENVIRONMENTAL ENGINEERING**

**Engineering in the Modern World**  
CEE 102A  
**Professor:** Littman, Michael G.

**Description:** Lectures and readings focus on bridges, railroads, power plants, steamboats, telegraph, highways, automobiles, aircraft, computers, and the microchip. Historical analysis provides a basis for studying societal impact by focusing on scientific, political, ethical, and aesthetic aspects in the evolution of engineering over the past two and a half centuries. The precepts and the papers will focus historically on engineering ideas including the social and political issues raised by these innovations and how they were shaped by society as well as how they helped shape culture.

**Schedule:** 11:00 AM - 11:50 AM M W

**Intro to Environmental Engineering**  
CEE 207  
**Professor:** Bourg, Ian Charles

**Description:** The course introduces the basic chemical and physical processes of relevance in environmental engineering. Mass and energy balance and transport concepts are introduced and the chemical principles governing reaction kinetics and phase partitioning are presented. We then turn our focus to the applications in environmental engineering problems related to water and air pollution.

**Schedule:** pre-recorded lectures

**Mechanics of Solids**  
CEE 205  
**Professor:** Adriaenssens, Sigrid M

**Description:** This course teaches fundamental principles of solid mechanics. Equilibrium equations, reactions, internal forces, stress, strain, Mohr's circle, and Hooke's law. Analysis of the stress and deformation in simple structural members for safe and stable engineering design. Axial force in bars, torsion in shafts, bending and shearing in beams, stability of elastic columns, strain transformation, stress transformation, combined loadings, design project.

**Schedule:** pre-recorded lectures
CLASSICS

Rhetoric and Politics
CLA 232
Professor: Bourbouhakis, Emmanuel C.

Description: What are the features of persuasive political speech? The reliance of democratic politics on memorable oratory stems from traditions dating back to ancient Greece and Rome which were revived in the modern era of parliamentary debates and stump speeches. This course will analyze the rhetorical structure of famous political speeches over time in a bid to better understand the potent mixture of aesthetics and ideology that characterizes political rhetoric, as well as the equally long tradition of regarding political rhetoric as insincere and unscrupulous. Students will try their hand at political speech-writing and oratory in class.

Schedule: 02:30 PM - 03:20 PM T TH

COMPARATIVE LITERATURE

Crafting Freedom: Women and Liberation
COM 376
Professor: Draper, Susana

Description: This course explores questions and practices of liberation in writings by women philosophers and poets whose work helped to create cultural and political movements in the U.S. and Latin America. Starting in the 60s, we will study a poetics and politics of liberation, paying special attention to the role played by language and imagination when ideas translate onto social movements related to social justice, structural violence, education, care, and the commons. Readings include Gloria Anzaldúa, Angela Davis, Silvia Federici, Diamela Eltit, Audre Lorde, Silvia Rivera Cusicanqui.

Schedule: 01:30 pm - 04:20 pm W

COMPUTER SCIENCE

Algorithms and Data Structures
COS 226
Professor: Wayne, Kevin

Description: This course surveys the most important algorithms and data structures in use on computers today. Particular emphasis is given to algorithms for sorting, searching, and string processing. Fundamental algorithms in a number of other areas are covered as well, including geometric algorithms, graph algorithms, and some numerical algorithms. The course will concentrate on developing implementations, understanding their performance characteristics, and estimating their potential effectiveness in applications.

Schedule: 11:00 AM - 12:20 PM T TH

Computer Networks
COS 461
Professors: Jamieson, Kyle Andrew, Rexford, Jennifer L.

Description: Survey of computer networks covering end-to-end principle, multiplexing, virtualization, packet switching vs. circuit switching, router design, network protocols, congestion control, internet routing architecture, network measurement, network management, and overlay networks. Survey of research papers from classic literature through contemporary research. This course will meet for joint lectures with COS 561.

Schedule: 10:00 AM - 10:50 AM T TH

Computer Vision
COS 429
Professor: Russakovsky, Olga

Description: This course is an introduction to the concepts of 2D and 3D computer vision. It surveys a wide range of topics from level-level vision to high-level recognition. We will discuss concepts such as filtering and edge detection; cameras and shape reconstruction; segmentation and clustering; optical flow and tracking; object recognition; motion recognition; statistical modeling of visual data, etc. Throughout the course, there will also be examination of aspects of human vision and perception that guide and inspire computer vision techniques.

Schedule: pre-recorded lectures

Computers in Our World
COS 109
Professor: Kernighan, Brian W.

Description: Computers are all around us. How does this affect the world we live in? This course is a broad introduction to computing technology for humanities and social sciences students. Topics will be drawn from current issues and events, and will include discussion of how computers work; what programming is and why it is hard; how the Internet and the Web work; security and privacy.

Schedule: 01:30 PM - 02:50 PM M W

Introduction to Programming Systems
COS 217
Professor: Morretti, Christopher

Description: An introduction to computer organization and system software. The former includes topics such as processor and memory organization, input/output devices, and interrupt structures. The latter includes assemblers, loaders, libraries, and compilers. Programming assignments are implemented in assembly language and C using the UNIX operating system. LMS: Canvas

Schedule: pre-recorded lectures

ECOLOGY AND EVOLUTIONARY BIOLOGY
**Immune Systems: Molecules to Populations**  
*EBB 327*  
**Professor:** Graham, Andrea Linn

**Description:** How do immune systems work, and why do they work as they do? Why is there so much immunological polymorphism in animal populations? To address these questions, students will examine immunology across multiple biological scales. At the molecular and cellular scales, students will learn mechanisms by which animals recognize and kill parasites. At the population scale, students will investigate causes of the tremendous immunological heterogeneity exhibited by animals. Both the clinical relevance and the evolutionary basis of polymorphisms will be emphasized.

**Schedule:** pre-recorded lectures

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**Life on Earth: Chaos and Clockwork in Nature**  
*EBB 211*  
**Professors:** Kocher, Sarah, Levine, Jonathan M., Sullivan, Katherine M.

**Description:** An examination of how life evolved and how organisms interact to shape the natural world. Why did the dinosaurs disappear? What mechanisms can produce the chameleon's camouflage or the giraffe's long neck? Why do ecosystems contain such a wide diversity of species when competition between them should eliminate all but a few? How will life on earth change with increasing human domination of the planet? These and other questions related to the origin and future of life, conflict and cooperation between species, and dynamics of ecosystems will be explored.

**Schedule:** pre-recorded lectures

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**ECONOMICS**

**Economics of Europe**  
*ECO 372*  
**Professor:** Weyerbrock, Silvia

**Description:** Europe is at a crossroads. Political and economic integration in the European Union (EU) exceeds levels reached in the rest of the world. Economic integration not only affects trade but also migration, agriculture, competition, regions, energy, and money. Most euro area economies have been struggling with interlocking crises involving debt, banking and growth. Moreover, the EU is facing Brexit and a migration crisis. This course studies economic integration, the ongoing crises, and policy responses. It uses economic analysis to study policy issues.

**Schedule:** 03:00 PM - 04:20 PM T TH

**Economics of the Labor Market**  
*ECO 331*  
**Professor:** Ashenfelter, Orley Clark

**Description:** To provide a general overview of labor markets. Covering labor force participation, the allocation of time to market work, migration, labor demand, investment in human capital (education, on-the-job training,
man-power training), discrimination, unions and unemployment. The course will also examine the impact of
government programs (such as unemployment insurance, minimum wages, or a negative income tax) on the
labor market.

Schedule: 11:00 AM - 12:20 PM M W

Introduction to Macroeconomics
ECO 101
Professor: Blinder, Alan Stuart

Description: Analysis of the operation of the national economy, with emphasis on the causes and consequences
of recessions and booms, inflation and unemployment -- and possible policy responses to each. Attention is
also paid to the banking and financial systems, the financial crisis, and international influences on the U.S.
economy.

Schedule: 11:00 AM - 11:50 AM T TH

Introduction to Microeconomics
ECO 100
Professor: Noonan, Kelly

Description: Economics studies the allocation of scarce resources. Since this is a microeconomics course, it
will focus on the decisions made by individual consumers and producers. We will consider a variety of different
market structures ranging from perfect competition to monopoly. We also will discuss the rationale for
government involvement when there are market failures.

Schedule: pre-recorded lectures

Money and Banking
ECO 342
Professor: Brunnermeier, Markus Konrad

Description: This course explores the interaction between money, financial markets and institutions. We
examine (1) the three roles of money, using cryptocurrencies as leading example, (2) the core principles of asset
pricing, (3) how financial institutions help to overcome financial frictions, but may lead to financial crisis and
bank runs, (4) how monetary and macroprudential policy manage inflation and can help to mitigate financial
crises, (5) the international financial architecture, especially the role of the International Monetary Fund, and the
impact of FinTech on the financial sector.

Schedule: 01:30 PM - 02:50 PM M W

Organization and Design of Markets
ECO 325
Professor: Kastl, Jakub

Description: This class studies how to solve problems of economic resource allocation via markets. The first
half will focus on matching markets. We will study how to assign students to schools, kidneys to patients,
workers to jobs and so forth. In the second half we will study auctions. We will discuss how they can be used to
discover price in various environments and their use to allocate goods such as advertising, financial assets or
radio spectrum. Throughout the course we will discuss the issues underlying the design of successful
marketplaces. The course will emphasize applications and connections between the different problems.
**SCHEDULE:** 11:00 AM - 12:20 PM T TH

**ELECTRICAL ENGINEERING**

**Contemporary Logic Design**
ELE 206  
**Professor:** Malik, Sharad  
**Description:** Introduction to the basic concepts in logic design that form the basis of computation and communication circuits. Logic gates and memory elements. Timing methodologies. Finite state systems. Programmable logic. Basic computer organization.

**Schedule:** 01:30 PM - 02:50 PM T TH

**Solid-State Devices**  
ELE 341  
**Professor:** Kahn, Antoine  
**Description:** The physics and technology of solid state devices. Review of electronic structure of semiconductors, energy bands and doping, followed by discussion of carrier transport by drift and diffusion and recombination/generation. Detailed analysis of p-n junctions, bipolar transistors and field effect transistors. Survey of a wide range of devices, including photodetectors, solar cells, light-emitting diodes and semiconductor lasers, highlighting contemporary concepts such as thin film electronics and 2D semiconductors.

**Schedule:** 03:00 PM - 04:20 PM T TH

**Special Topics in Information Sciences and Systems: Theory of Deep Weakly Supervised Learning**  
ELE538B  
**Professor:** Lee, Jason  
**Description:** Graduate level course focusing on theoretical foundations of deep learning with a focus on weakly supervised aspects. The class covers the theoretical analysis tools used in deep learning including stochastic gradient, uniform convergence theory and statistical learning. The course focuses primarily on unsupervised learning and weakly supervised learning. Topics include generative models, self-training, transfer learning, representation learning, semi-supervised learning and other forms of self-supervised learning. Prior knowledge on statistics, linear algebra, probability theory and optimization is required.

**Schedule:** 01:30 PM - 04:20 PM T

**ENERGY STUDIES**

**Materials for Energy Technologies and Efficiency**  
ENE 267  
**Professor:** White, Claire Emily
**Description:** An introductory course focused on the new and existing materials that are crucial for mitigating worldwide anthropogenic CO2 emissions and associated greenhouse gases. Emphasis will be placed on how materials science is used in energy technologies and energy efficiency; including solar power, cements and natural materials, sustainable buildings, batteries, water filtration, and wind and ocean energy. Topics include: atomic structure and bonding; semiconductors; inorganic oxides; nanomaterials; porous materials; conductive materials; membranes; composites; energy conversion processes; life-cycle analysis; material degradation.

**Schedule:** 10:00 AM - 10:50 AM T TH

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**ENGINEERING**

**Designing Ventures To Change the World** - this class is by application only EGR 488

**Professor:** Danner, John David

**Description:** This course looks at the UN's Sustainable Development Goals (SDGs) - poverty, gender inequality, disease, poor water, illiteracy, etc. - through the lens of social-impact entrepreneurial ventures, exploring whether and how entrepreneurs can meaningfully address those issues in ways that complement governmental and charitable efforts. First, we will consider the SDGs themselves, second, we will focus on the challenges and opportunities reflected in one or two specific SDG-related settings of interest to students, such as energy, women's health, sanitation, or a relevant global business like coffee.

**Other Information:** This class is by application only. Acceptance in this class is by invitation only. For consideration send an email to PUCAP@princeton.edu stating in 150 words or less, your reason for wanting to be in the class and your background experience. **All replies must be submitted by August 7, 2020** for consideration. Late applicants will not be considered.

**Schedule:** pre-recorded lectures

**Multivariable Calculus**

EGR 156

**Professor:** Glisik, Branko

**Description:** This course will present the fundamentals of multivariable calculus from an engineering perspective, using examples from all 6 engineering departments. As a first introduction to functions of many variables, it will cover key topics important to the various engineering fields, including vectors and vector valued functions in 2 and 3 dimensions, partial derivatives, multiple integrals, optimization, and the calculus of vector fields.

**Schedule:** 11:00 am - 12:20 pm

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**ENGLISH**

**American Literature: 1930-Present**

ENG 368

**Professor:** Mitchell, Lee Clark
**Description:** A study of eleven modern American writers over eighty years that emphasizes the transition from modernism to postmodernism to retro-realism.

**Schedule:** 10:00 AM - 10:50 AM M W

**The Essay**  
ENG 203  
**Professor:** Nunokawa, Jeff

**Description:** This course introduces students to the range of the essay form as it has developed from the early modern period to our own. The class will be organized, for the most part, chronologically, beginning with the likes of Bacon and Hobbes, and ending with some contemporary examples of and reflections on the form. It will consider how writers as various as Sidney, Hume, Johnson, Emerson, Woolf, C.L.R. James, and Stephen Jay Gould have defined and revised The Essay.

**Schedule:** 02:30 PM - 03:20 PM M W

**GEOSCIENCES**

**Climate: Past, Present, and Future**  
GEO 102A  
**Professor:** Sigman, Daniel Mikhail

**Description:** Which human activities are changing our climate, and does climate change constitute a major problem? We will investigate these questions through an introduction to climate processes and an exploration of climate from the distant past to today. We will also consider the impact of past and ongoing climate changes on the global environment and on humanity. Finally, we will draw on climate science to identify and evaluate possible courses of action. Intended to be accessible to students not concentrating in science or engineering, while providing a comprehensive overview appropriate for all students.

**Schedule:** 11:00 AM - 12:20 PM T TH

**Mineralogy**  
GEO 378  
**Professor:** Duffy, Thomas S.

**Description:** Minerals are the fundamental building blocks of the Earth. Their physical, chemical, and structural properties determine the nature of the Earth and they are the primary recorders of the past history of the Earth and other planets. This course will provide a survey of the properties of the major rock-forming minerals. Topics include crystallography, crystal chemistry, mineral thermodynamics and mineral occurrence. Emphasis will be on the role of minerals in understanding geological processes.

**Schedule:** L01 01:30 PM - 02:50 PM T TH
HISTORY

20th-Century Japan
HIS 322
Professor: Garon, Sheldon Marc

Description: The course provides a general introduction to Japanese history from 1890 to the present, with emphasis on Japan's rise as the modern world's first non-Western power, imperialism, industrialization, social change, gender relations, democracy, World War II, the U. S. Occupation, state management of society, the postwar "economic miracle" and recent stagnation, and the preoccupation with national identity in a Western-dominated world. In the final weeks, we will think about post-1945 developments in terms of continuities with (and divergences from) the prewar and wartime history of Japan.

Schedule: pre-recorded lectures

Colonial Latin America to 1810
HIS 303
Professor: Candiani, Vera Silvina

Description: What is colonization? How does it work? What kind of societies does it create? Come find out through the lens of the Latin America. First we study how the Aztec and Inca empires subdued other peoples, and how Muslim Iberia fell to the Christians. Then, we learn about Spanish and Portuguese conquests and how indigenous resistance, adaptation, and racial mixing shaped the continent. You will see gods clash and meld, cities rise and decline, and insurrections fail or win. Silver mines will boom and bust, slaves will toil and rebel; peasants will fight capitalist encroachments. This is a comprehensive view of how Latin America became what it is.

Schedule: 11:00 AM - 11:50 AM T TH

Democracy and Slavery in the New Nation
HIS 373
Professor: Wilentz, Sean

Description: An interpretive history of the United States from the framing of the Constitution to the coming of the Civil War. The course will cover politics and social development, while emphasizing focused reading of primary documents. Topics will include the debate over the Federal Constitution, the presidency of Thomas Jefferson, the rise of cotton slavery, Jacksonian democracy and the growth of political parties, antislavery and reform, westward expansion, and the growing social and political divisions between North and South.

Schedule: pre-recorded lectures

Europe from Antiquity to 1700
HIS 211
Professor: Grafton, Anthony Thomas

Description: This course traces an epic story: How Greeks and Romans, Jews and Christians, nobles and merchants, princesses and servants, serfs and slaves built what is now called Western Civilization.
Schedule: pre-recorded lectures

History of East Asia to 1800
HIS 207
Professors: Conlan, Thomas Donald, Wen, Xin
Description: A general introduction to the history of the political cultures in China and Japan, with some heed to comparisons with developments in Korea.

Schedule: 11:00 AM - 11:50 AM M W

Marx and the Marxist Method of Analysis
HIS 412
Professor: Candiani, Vera

Description: What do you know about Marxism? Public discourse and academia in the U.S. often dismiss Marx and the Marxist method: economic determinism at its worst; simplistically teleological; Marxists ignore race, gender, culture, and the environment; the Communist Manifesto sums it all up; Soviet totalitarianism proved its utopian failure. Is all this true? Let's test it. Let's take Marxism seriously. This course begins with fundamental works by Marx, Engels, Luxemburg, Trotsky, and Lenin and then expands to study how social and natural sciences have used the method to explain key processes in their domains.

Schedule: 01:30 pm - 04:20 pm W

The United States, 1920-1974
HIS 383
Professor: Kruse, Kevin Michael

Description: The history of modern America, with particular focus on domestic political and social changes. Topics include the Roaring 20s; the Great Depression and the New Deal; the homefront of World War II and the Cold War; the civil rights movement and the Great Society; the Vietnam War; the sexual revolution; the Silent Majority, the Nixon administration, and Watergate.

Schedule: pre-recorded lectures

US Intellectual History
HIS 375
Professor: Wirzbicki, Peter

Description: This course examines the history of the United States through its intellectuals and major ideas. Starting with the American Revolution and progressing through to the contemporary intellectual scene, it hopes to introduce students to major debates, themes, and intellectual movements in the history of American ideas. We will read a number of famous thinkers and actors in their own words: Thomas Jefferson, Henry David Thoreau, Jane Addams, Martin Luther King, Jr., and many others. Students will leave this class with a deeper understanding and appreciation for the ideas and the thinkers who have shaped the nation's politics and culture.

Schedule: 10:00 AM - 10:50 AM T TH
PROGRAM IN LINGUISTICS

Introduction to Language & Linguistics
LIN 201
Professor: Fellbaum, Christiane Dorothea

Description: An introduction to the scientific analysis of the structure and uses of language. Core areas covered include phonetics and phonology, morphology, the lexicon, syntax, semantics and pragmatics, with data from a wide range of languages. Additional topics include language acquisition, bilingualism, neurolinguistics, historical linguistics and computational linguistics.

Schedule: pre-recorded lectures

MATH

Applied Algebra
MAT 340
Professor: McConnell, Mark Weaver

Description: An applied algebra course that integrates the basics of theory and modern applications for students in MAT, APC, PHY, CBE, COS, ELE. This course is intended for students who have taken a semester of linear algebra and who have an interest in a course that treats the structures, properties and application of groups, rings, and fields. Applications and algorithmic aspects of algebra will be emphasized throughout.

Schedule: 03:00 PM - 04:20 PM T TH

Single Variable Analysis with an Introduction to Proofs
MAT 215
Professor: Chang, Alice

Description: An introduction to the mathematical discipline of analysis, to prepare for higher-level course work in the department. Topics include rigorous epsilon-delta treatment of limits, convergence, and uniform convergence of sequences and series. Continuity, uniform continuity, and differentiability of functions. The Heine-Borel Theorem. The Riemann integral, conditions for integrability of functions and term by term differentiation and integration of series of functions, Taylor's Theorem.

Schedule: pre-recorded lectures

MECHANICAL AND AEROSPACE ENGINEERING

Engineering Design
MAE 321
Professor: Northey, Glenn Arther

Description: This course introduces the technical foundation and basic processes of Mechanical Design, which are appropriate for the design of both mechanical systems, and components. The emphasis is on designing for
the complete product life-cycle. Topics in parametric design and design optimization using Finite Element Analysis (FEA), Computer Aided Design (CAD), and Manufacturing (CAM) are introduced in the classroom and online and then reinforced by team and individual assignments.

**Schedule:** 10:00 AM - 10:50 AM M W F

**Fluid Dynamics**  
MAE 335  
**Professor:** Nosenchuck, Daniel Mark

**Description:** The course is focused on compressible and incompressible inviscid fluid flow. Compressible subsonic and supersonic flows are studied in the first half of the course. The remaining portion of the semester addresses low-speed, incompressible fluid flows and aerodynamics of two and three-dimensional wings and bodies. Concepts of thrust, lift and drag are introduced and applied.

**Schedule:** 08:30 AM - 09:50 AM T TH

**Heat Transfer**  
MAE 423  
**Professor:** Nosenchuck, Daniel Mark

**Description:** This course will cover fundamentals of heat transfer and applications to practical problems in energy conversion and conservation, electronics, and biological systems. Emphasis will be on developing a physical and analytical understanding of conductive, convective, and radiative heat transfer, as well as design of heat exchangers and heat transfer systems involving phase change in process and energy applications. Students will develop an ability to apply governing principles and physical intuition to solve multi-mode heat transfer problems.

**Schedule:** 11:00 AM - 11:50 AM M W F

**Modern Solid Mechanics**  
MAE 223  
**Professor:** Kosmrlj, Andrej

**Description:** Fundamental principles of solid mechanics: equilibrium equations, reactions, internal forces, stress, strain, Hooke's law, torsion, beam bending and deflection, and analysis of stress and deformation in simple structures. Integrates aspects of solid mechanics that have applications to mechanical and aerospace structures (engines and wings), as well as to microelectronic and biomedical devices. Topics include stress concentration, fracture, plasticity, and thermal expansion. The course synthesizes descriptive observations, mathematical theories, and engineering consequences.

**Schedule:** 11:00 AM - 12:20 PM T TH

**Structure and Properties of Materials**  
MAE 324  
**Professor:** Arnold, Craig B.

**Description:** Relates to the structures, properties, processing and performance of different materials including metals, alloys, polymers, composites, and ceramics. This course also discusses how to select materials for
engineering applications. This course satisfies the MAE departmental requirement in materials as well as the MSE certificate core requirement.

**Schedule:** 01:30 PM - 02:50 PM M W

**Thermodynamics**  
**MAE 221**  
**Professor:** El-Gabry, Lamyaa

**Description:** Heat and work in physical systems. Concepts of energy conversion and entropy, primarily from a macroscopic viewpoint. Efficiency of different thermodynamic cycles, with applications to everyday life including both renewable and classical energy sources. In the laboratory, students will carry out experiments in the fields of analog electronics and thermodynamics.

**Schedule:** 10:00 AM - 10:50 AM M W F

**MEDIEVAL STUDIES**

**The World of the Middle Ages**  
**MED 227**  
**Professor:** Reimitz, Helmut, Tannous, Jack, Boulos, Victor

**Description:** We will begin in 476 with the fall of Rome and will end in 1453, with the fall of New Rome (Constantinople). In between, we will trace the different trajectories that the area stretching from Iceland to Iran traveled along over the course of this fateful millennium. We will meet Northern barbarians, Arab armies, Vikings, Crusaders, Mongols, and the Ottomans; we will witness the birth of Islam and medieval Islamic civilization; Charlemagne's creation of the Western Roman empire; will see clashes between Popes and rulers and Caliphs and Muslim religious authorities. We will do all this and more, all the while asking: what were the Middle Ages?

**Schedule:** 01:30 PM - 02:20 PM M W

**MUSIC**

**The Ballet**  
**MUS 223**  
**Professor:** Morrison, Simon Alexander

**Description:** A history of ballet from its origins in the French courts through its development into a large-scale theatrical spectacle in the 19th century and its modernist deformation. Emphasis will be placed on seminal dancers, choreographers, and composers, nationalist tradition, and socio-political context.

**Schedule:** 11:00 AM - 11:50 AM T TH
NEAR EASTERN STUDIES

Muslims and the Qur'an
NES 240
Professor: Zaman, Muhammad Qasim

Description: A broad-ranging introduction to pre-modern, modern, and contemporary Islam in light of how Muslims have approached their foundational religious text, the Qur'an. Topics include: Muhammad and the emergence of Islam; theology, law and ethics; war and peace; mysticism; women and gender; and modern debates on Islamic reform. We shall examine the varied contexts in which Muslims have interpreted their sacred text, their agreements and disagreements on what it means and, more broadly, their often competing understandings of Islam and of what it is to be a Muslim.

Schedule: 10:00 AM - 10:50 AM M W

NEUROSCIENCE

Functional Neuroanatomy
NEU 200
Professor: Graziano, Michael Steven

Description: A crucial part of neuroscience is understanding how function has its foundation in anatomy. This course traces neuroanatomical pathways through the central nervous system. It emphasizes the primate brain, especially the human brain. The course covers how nuclei, ganglia, and layered structures such as cortex are arranged physically in the brain, the fiber pathways by which they connect to each other, and how this connectivity relates to their function. The material will encompass systems within the brain stem, sensory systems, motor systems, higher cognitive systems, and the interconnectivity and interaction of these systems.

Schedule: 11:00 AM - 12:20 PM M W

OPERATIONS RESEARCH AND FINANCIAL ENGINEERING

Energy and Commodities Markets
ORF 455
Professor: Sircar, Ronnie

Description: This course is an introduction to commodities markets (oil, gas, metals, electricity, etc.), and quantitative approaches to capturing uncertainties in their demand and supply. We start from a financial perspective, and traditional models of commodity spot prices and forward curves. Then we cover modern topics: game theoretic models of energy production (OPEC vs. fracking vs. renewables); quantifying the risk of intermittency of solar and wind output on the reliability of the electric grid (mitigating the duck curve); financialization of commodity markets; carbon emissions markets. We also discuss economic and policy implications.

Schedule: 11:00 AM - 12:20 PM M W

Regression & Applied Time Series
ORF 405
Professor: Tangpi, Ludovic


Schedule: 03:00 PM - 04:20 PM M W

PHILOSOPHY

Advanced Logic
PHI 323
Professors: Burgess, John P.

Description: An introduction to axiomatic set theory, up to the proof of the consistency of the axiom of choice.

Schedule: 11:00 AM - 11:50 AM T TH

Introduction to Moral Philosophy
PHI 202
Professors: Frick, Johann, David Anand

Description: An introduction to central topics of moral philosophy. Questions include: What makes an action morally right or wrong, and why? Is the right action the one with the best consequences? Do our intentions matter for the rightness of our actions? Is there a moral difference between killing someone and letting someone die? Is there 'moral luck'? What makes someone's life go best for her? What is the moral status of future persons? Is abortion morally permissible? Is it permissible to kill animals to eat them? Is there a single true morality or is moral truth relative to cultures? Does anything really matter or did we just evolve to think so?

Schedule: 12:30 PM - 01:20 PM T TH

Theory of Knowledge
PHI 313
Professor: De Toffoli, Silvia

Description: We live our lives thinking we know a lot of stuff: it is 3pm, I have hands...But do we really know any of this? If a skeptic challenges us to prove that we are not living in a computer simulation, what could we say? How can we justify our beliefs? Can two people with the same evidence rationally disagree? We form beliefs spontaneously, but can we also sometimes control what we believe? Can we rationally believe something just because believing it will bring about good consequences? In what ways are we responsible for our beliefs? Can our practices of gaining and sharing knowledge bring about social injustice and if so, what can we do about it?

Schedule: 11:00 AM - 11:50 AM M W
PHYSICS

Introductory Physics I
PHY 101
Professor: Wagoner, Kasey

Description: The course is concerned with an introduction to the fundamental laws underlying physics and having general application to other areas of science. The treatment is complete and detailed; however, less mathematical preparation is assumed than for PHY 103-104. Mechanics and thermodynamics are treated quantitatively with a special emphasis on problem solving. In the spring semester PHY 102 covers electricity and magnetism, optics and quantum physics using the topics treated in PHY 101.

Schedule: 12:30 PM - 01:20 PM TH

POLITICS

American Politics
POL 220
Professor: Staszak, Sarah Lynn

Description: An introduction to the institutions and political processes of American government and democracy. Topics will include the Constitution and American political tradition, federalism, political institutions, elections and representation, interest groups and social movements, civil rights and liberties, and the politics of public policy

Schedule: pre-recorded lectures

Constitutional Interpretation
POL 315
Professor: George, Robert Peter

Description: A study of the structure of the American constitutional system and of the meaning of key constitutional provisions. Students will critically evaluate competing theories of, and approaches to, constitutional interpretation.

Schedule: pre-recorded lectures

Mass Media, Social Media, & American Politics
POL 327
Professor: Guess, Andy

Description: This course considers the role of both mass media and social media in American politics and the influence of the media on Americans' political attitudes, beliefs, and behaviors. We will examine the nature of news and news-making organizations, the role of the news media in electoral campaigns, how the media shape the behavior of politicians once in office, political advertising, and the ability of social media to facilitate collective action.
Political Economy of the United States  
POL 335  
Professor: McCarty, Nolan Matthew

Description: Many of America's problems are economic in nature, yet politics make the solutions elusive. In a new lecture course "The Political Economy of the United States", this conundrum is explored in detail. We seek to explicitly understand the links between economic outcomes and political processes. Among the concepts explored are special interest influence, the role of money in politics, and regulatory capture. These concepts are brought to life in discussions about key issues and debates such as wealth taxation, the monopolization of social media, and the political effects of economic shocks and de-industrialization.

Schedule: 10:00 AM - 10:50 AM T TH

Politics in Africa  
POL 366  
Professor: Widner, Jennifer Anne

Description: This course introduces the study of African politics. The lectures briefly review the social and historical context of contemporary political life. They then profile some of the changes of the early post-Independence period, the authoritarian turn of the 1970s and 80s, and the second liberation of the 1990s and 2000s, before turning to some contemporary challenges (e.g., conflict resolution, land tenure, natural resource management, public goods provision, climate resilience, health, urbanization). Each session introduces a major analytical debate, theories, and African views. Broadly comparative; some special attention to selected countries.

Schedule: 10:00 AM - 10:50 AM M W

The Presidency and Executive Power  
POL 325  
Professor: Wright, Lauren

Description: Topics to be covered include the origin, nature, uses and limits of presidential power; the presidential selection process; the relationship between the President and other significant political actors-Congress, the Press, executive branch agencies, and the public; presidential accountability and the importance of presidential personality.

Schedule: 09:00 AM - 09:50 AM M W

PSYCHOLOGY

Cognitive Neuroscience of Selective Attention  
PSY 316  
Professor: Buschman, Timothy J.
Description: Attention is our ability to select information relevant to behavior; focusing our limited cognitive/neural resources on those stimuli and thoughts that are critical to our current task. This course will review the neuroscience of selective attention, from the theoretical foundations provided by cognitive psychology to the neural underpinnings identified by systems neuroscience. The course will present a 'hands on' science experience, combining experimental demonstrations and discussions of current research topics to learn the design and analyses of contemporary experiments in the attention field.

Schedule: 11:00 AM - 12:20 PM T TH

Social Psychology  
PSY 252  
Professor: Tamir, Diana I.

Description: The scientific study of social behavior, with an emphasis on social interaction and group influence. Topics covered will include social perception, the formation of attitudes and prejudice, attraction, conformity and obedience, altruism and aggression, and group dynamics.

Schedule: 02:30 PM - 03:20 PM M W

RELIGION

Religion in Japanese Culture  
REL 228  
Professor: Lowe, Bryan D.

Description: What does religion mean for a culture in which the majority of people identify as nonbelievers but still regularly engage in seemingly religious acts? By looking at practices and teachings that do not easily map onto monotheistic traditions, we will question commonly held assumptions about religion. This course introduces major themes and issues in Japanese religions from ancient to modern times, focusing on the role of religion in culture and history. We will examine aspects of Buddhist, Shinto, Christian and other traditions, as well as topics such as myths, ghosts, the environment, politics, secularism, and violence.

Schedule: 10:00 am - 10:50 am M W

SLAVIC LANGUAGES AND LITERATURES

Pushkin, Gogol, Dostoevsky: Introduction  
SLA 219  
Professor: Wachtel, Michael Alex

Description: A study in English of masterpieces of Russian literature from the late eighteenth to the mid-nineteenth century. The focus of the course is on close readings of individual works. At the same time, we will pay close attention to the way a distinctively Russian national tradition is created, in which writers consciously respond to the works of their predecessors. No previous knowledge of Russian language, history, or culture is expected.
Schedule: pre-recorded lectures

SOCIOLOGY

Contemporary Japanese Society
SOC 318
Professor: Raymo, James M.

Description: In this course, students will develop a broad understanding of how Japanese society functions today by focusing on several key institutions and social domains: politics, the economy, education, employment, family, media, and the larger population. This understanding of contemporary Japanese society (1980s-present) will come through reading of Japan scholars in a range of fields, reading recent media portrayals of Japan, attending lectures designed to supplement and extend the readings, engaging in classroom discussion based on student-generated questions, and writing a research paper on a topic of student's choice.

Schedule: pre-recorded lectures

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

China's Foreign Relations
SPI 316
Professor: Flaherty, Martin S.

Description: This course will review and analyze the foreign policy of the People's Republic of China from 1949 to the present. It will examine Beijing's relations with the Soviet Union, the United States, Northeast Asia, Southeast Asia, and the developing world during the Cold War. It will explore the impact on China's foreign relations of changes in the Chinese economy since the reform era began in 1978, the domestic legitimacy challenges in Beijing since the Tiananmen protests of 1989, the continuing rise of Chines power and influence in Asia and beyond since the end of the Cold War, and recent developments since the accession of Xi Jinping.

Schedule: 09:00 AM - 09:50 AM T TH

International Development
SPI 302
Professor: Adsera, Alicia

Description: This course focuses on less developed countries. Covered topics include economic growth; economic inequality, poverty and personal well-being; foreign aid; credit markets and microfinance; population change and gender inequality; health and education provision, and labor markets. The course tackles these issues both theoretically and empirically.

Schedule: 10:00 AM - 10:50 AM T TH

Race and Public Policy
SPI 331
Professor: Massey, Douglas S.
**Description:** Analyzes the historical construction of race as a concept in American society, how and why this concept was institutionalized publicly and privately in various arenas of U.S. public life at different historical junctures, and the progress that has been made in dismantling racialized institutions since the civil rights era.

**Schedule:** 11:00 AM - 11:50 AM M