WHAT ARE BYRNE SEMINARS?

Byrne Seminars are small, one-credit courses, limited to 20 students. Offered through the Office of Undergraduate Academic Affairs, these classes are taught by our world-renowned faculty who come from departments and professional schools across the university. Each unique seminar offers students the chance to experience the excitement of original research, as faculty members share their curiosity, their intellectual passion, and their new ideas and fields of knowledge. Some seminars take field trips, do hands-on research, or share a meal at the Rutgers Club. Seminars typically meet for 10 weeks, starting in the first week of each semester. You may take up to two Byrne courses in your first year, in consecutive semesters. The seminars are graded Pass/No Credit, and have no formal exams. Students may register for a one-credit seminar in addition to the 12 – 15 credit standard course-load. The seminars are not meant to compete with other courses.

HOW DO I SIGN UP?

You can register for a Byrne Seminar when you select your other courses this summer or you can add a Byrne to your schedule online through WebReg during the first week of classes. This catalog includes section and index numbers for each fall seminar below the course description. You will find the Online Schedule of Classes useful in determining which courses are open and will fit best into your schedule. Enter subject code “090” and course number “101” to get a list of Byrne Seminars for the semester, including up-to-date information about time and location.

HAVE QUESTIONS?

Email: byrneseminars@rutgers.edu / Call 848.932.6971
Or visit our website: WWW.BYRNE.RUTGERS.EDU

FALL 2019

RU-1st Seminar ................................................................. 7
Paul Robeson Anniversary Seminar ........................................ 8
Aresty-Byrne Seminars ...................................................... 10
Honors College Byrne Seminars ........................................... 11
Byrne Seminars with Johnson & Johnson ............................ 12
First-Year: Humanities ....................................................... 14
First-Year: Social Sciences ................................................ 17
First-Year: Sciences .......................................................... 23

SPRING 2020

First-Year: Humanities ................................................... 32
First-Year: Social Sciences ................................................. 35
First-Year: Sciences ........................................................ 39
What is a Byrne Seminar? As first-year students at Rutgers University–New Brunswick, Byrne Seminars provide a window into the vast array of academic disciplines available to you. Rutgers is proud to house the Byrne Seminar Program thanks to the generous support of the Byrne family. This program offers you a unique opportunity to work closely with faculty members and potential mentors at the start of your time at Rutgers, to meet and develop close friendships with peers sharing similar interests, and to explore into intellectual areas that could spark your enthusiasm for future academic pursuits.

Leafing through the pages of this catalogue, you will see the breadth and scope of the Byrne course offerings. Some of the featured seminars this semester include: “Exploring the Deep Sea,” which introduces students to research of the deep-sea environment and its inhabitants; “Prosecution: Practice, Ethics, and Justice,” which studies the role of prosecutors as protectors of the community and as agents of social justice; and “Paperotics and Art,” which examines the latest research in paper-based robotics.

I encourage you to join the thousands of students who have enrolled in the Byrne Seminar Program and have been introduced to new fields of inquiry that have helped shape their academic experiences at Rutgers. Take a Byrne Seminar and it will change your view on the world.

Christopher J. Molloy, Ph.D.
Chancellor, Rutgers University–New Brunswick
FROM THE VICE CHANCELLOR

Since 2007, the Byrne Seminars have allowed first-year students to explore unique research and academic areas, which piqued their interest in fields outside of their comfort zone or intended major. This year we will also be celebrating the 100th anniversary of Paul Robeson’s graduation from Rutgers. Robeson was one of Rutgers’ most distinguished alumni and represented the very fabric Rutgers is made of. In partnership with Student Affairs-Living Learning Communities, we are excited to offer “The Undiscovered Paul Robeson,” a special seminar that will examine Robeson’s life and legacy.

Students who took a Byrne Seminar during their first year reported that the opportunity to study with a tenured professor in a small seminar environment had a profound impact on their collegiate experience, often opening doors to research opportunities and providing direction in choosing a major. The Byrne experience allows students to form a community of friends with whom they continue to share both academic and co-curricular interests and activities as they navigate life at Rutgers and beyond.

I applaud the students who explore the diverse course offerings through the Byrne Seminars. I would also like to thank the faculty across the university who go above and beyond—from offering research assistantships through the Aresty Research Center, to providing sage advice to students applying to graduate school or entering the workforce.

I encourage students to take advantage of the opportunity to participate in a Byrne Seminar and challenge the way they think and learn. The Seminars play an important role in welcoming students to the research culture of Rutgers and encouraging scholarly development.

Ben Sifuentes-Jáuregui, Ph.D.
Vice Chancellor, Undergraduate Academic Affairs
Now in its 12th year, the Byrne Seminars is pleased to offer more than 100 courses designed to give first year students the opportunity to work closely with our renowned research faculty in small class settings. Since the commencement of the program, over 25,000 students have participated in the more than 1,700 seminars offered across a diverse cluster of research disciplines. This year, we have partnered with the RU-1st initiative in order to enhance access to the possibilities that the Byrne Seminars offer for our first-generation students. Through this partnership, we are proud to offer special seminars on topics such as visual arts, education policy, and how to pursue a career in STEM fields.

The Byrne Seminars can contribute to your student success at Rutgers for a variety of reasons. Each mini-course aids your development as a critical thinker and an articulate communicator while providing a community network of support that introduces you to senior faculty, mentors, and advisors as well as out-of-class high impact experiences that can help to sustain you not only through this important transition to Rutgers, but for your entire career at the college.

We will be dedicating this year’s catalog to one of Rutgers’ most notable alumni, Paul Robeson, as our campus will be continuing the year-long celebration of the 100th anniversary of his graduation from Rutgers.

James H. Whitney III, Ed.D.
Assistant Vice Chancellor, Undergraduate Academic Affairs and Byrne Seminars

Student Access and Educational Equity (SAEE) provides students with a community of support, academic resources, and social and cultural experiences. SAEE developed the RU-1st initiative to help first-generation students feel accepted and engaged in the Rutgers University-New Brunswick community. The RU-1st initiative supports first-generation student success by providing opportunities for students to have a successful personal, professional, academic, and social college experience.

Who RU @ the University?
Nichole Margarita Garcia (Educational Psychology)

What is the purpose of attending a university? What is your role as a college student? More importantly, who are RU @ Rutgers and what is the impact you want to make? This course will explore the relationship of higher education, society, and your role as college students. We will explore an emerging field called Critical University Studies (CSU), and use Rutgers University as a site of exploration. CSU serves as an approach to examine institutions of higher education in the United States in relation to finance, federal and state governance, faculty, students, curriculum, and academic leadership. This course will focus on university and college students who have different identities such as race, class, gender, sexuality, and/or religion. Students will participate in Historical Walking Tours of the College Avenue Campus and capture their experiences via Instagram. Students will learn about faculty in all disciplines at Rutgers and have the opportunity to meet and greet them. Students will have the opportunity to present on topics they find of interest at Rutgers and who they are as students.

01:090:101 section 67 index 08220
In 2019, Rutgers marks the centennial anniversary of Paul Robeson’s graduation from Rutgers College in 1919. In recognition, our community honors his achievements as a scholar, athlete, actor, singer, and global activist in a yearlong celebration featuring lectures, performances, art exhibitions, and more. The dedication of the Paul Robeson Plaza on the College Avenue Campus in spring 2019 will pay tribute to his legacy as one of Rutgers University’s most distinguished alumni and the quintessential 20th century Renaissance man.

The son of a runaway slave, Robeson attended Rutgers College in New Brunswick on an academic scholarship, becoming the university’s third black student and its first black football player. At Rutgers, “Robey”—as he was known at school—showed his prowess on the athletic field as well as in the classroom. An extraordinary athlete, he won 15 varsity letters in football, basketball, baseball, and track. He was a two-time All-American in football who is in the College Football Hall of Fame. His scholarly accomplishments included being inducted into the Phi Beta Kappa Society and Rutgers’ Cap and Skull Honor Society. At Rutgers, Robeson, who spoke more than 20 languages fluently, honed his oratory skills as a member of the Intercollegiate Debating Association. He was valedictorian of his graduating class in 1919.

After graduation, Robeson earned a law degree from Columbia Law School but decided to use his artistic talents in theater and music to promote African and African-American history and culture. Over nearly four decades, he achieved worldwide acclaim as a vocalist and actor on stage and screen. A towering figure in the African-American struggle for human dignity and democratic rights, he connected this struggle with those of other peoples around the world who were also fighting for political rights, cultural recognition, and economic justice. Among many other social justice movements that he embraced, Paul Robeson pioneered the global solidarity movement against racial segregation and white supremacy in South Africa and supported and marched with various British union movements in the United Kingdom struggling for better working conditions. The seminar introduces students to the life and legacy of Paul Robeson, especially with respect to how he integrated “home” and “world” into his civil rights activism.

The Byrne is a collaboration with Student Affairs-Living Learning Communities for students who reside on the Paul Robeson floor. This Byrne is open to all students.

01:090:101 section AC index 09987
The Honors College at Rutgers University–New Brunswick provides students from a range of undergraduate schools with an interdisciplinary, research-focused living-learning educational experience. In partnership with the Honors College, the Byrne Seminars Program is pleased to offer seminars specifically designed for incoming Honors College scholars. Honors College Byrne Seminars are intended to introduce students to the kind of interdisciplinary study that is a cornerstone of the Honors College’s mission through small courses that build on faculty members’ research interests. In addition to these select Honors College designated seminars, Honors College scholars have the opportunity to enroll in any traditional Byrne Seminar to fulfill their first-year Byrne requirement.

The Biology of Infectious Diseases
Martin J. Blaser (Medicine and Microbiology – RWJMS; Director, Center for Advanced Biotechnology and Medicine)

We live in a microbial world. Most of our focus has been on microbes as “germs,” for good reason. We will discuss some of the most important infections in the world, including tuberculosis, malaria, HIV, influenza and others, and then focus on how other microbes keep us healthy, and the biological costs of antibiotics. Students will be actively involved in their learning in this course by preparing seminars, among other activities. One useful reference will be the instructor’s book: Missing Microbes.

01:090:101 section 29 index 09071

The Books That Make Us
Marija Dalbello (Library and Information Science)

In this seminar, we will examine the life-stories of select monuments of writing, such as the Sumerian clay tablets, the original (Hokusai) manga, the Gutenberg Bible (the first major book printed with the printing press), and Carl Jung’s notebooks. We will consider their material life, the technologies necessary to produce them, and the meanings that they had for their contemporaries. How did people make these seminal works, and why? How do such important works help us make sense of our world? In what sense do these works represent revolutionary text technologies and how have they revolutionized the world of ideas? We will also think about writing itself as a technology that encompasses letters, drawings, graffiti, and illustrations; and learn how texts can be hand-written, painted, or inscribed, as well as mechanically and digitally produced. We will explore a wider context for circulation of books, texts, and reading across media forms. In order to view, handle and examine actual specimens, we will visit a rare books library in the area or New York City, and use the collections of the Zimmerli Art Museum at Rutgers.

01:090:101 section 20 index 05264

Healthy Body, Healthy Mind: High Performance Training Is Not Just for Athletes*
Sunita G. Kramer (Assistant Vice Provost)
Issata Oluwadare (Associate Dean for Student Affairs, Honors College)

Maximizing energy and learning how to stay mentally focused are issues of primary concern to the endurance athlete. However, learning how to maximize performance should apply to anyone who wants to function at a high level, whether a corporate executive or a first-year college student. In this seminar, we will examine successful approaches to sustained high performance that have been used both on and off the playing field. Through readings and discussions, students will learn about the molecular and genetic basis for improving fitness including changes in metabolism, recovery patterns, sleep and mental health. Students will also have the opportunity to explore ways to maximize their personal energy, to feel physically energized, emotionally connected, and mentally focused, and to obtain “full engagement in work and life,” as demonstrated by the highly successful program that is run through the Human Performance Institute at Johnson & Johnson.

01:090:101:98 index 09361

*Open to first-generation Honors College students
The Art and Science of Positive Leadership
Sharon Lydon (Rutgers Business School)
Nancy Mark (Director, Health Care Compliance & Privacy, Johnson & Johnson)

Throughout history, and certainly during the history of the United States and Rutgers University, progress has been synonymous with leadership. The revolutionary understanding of leadership is that it is everywhere and in everyone’s capacity. While some may be born with a number of the attributes needed for outstanding leadership, it is well accepted, that leadership is something that can be learned and that can be studied. This seminar explores qualitative and quantitative research "on leadership," and reviews research and theory toward the goal of empowering students to be leaders in all aspects of life, including college, career, and community. Topics include leadership in academic, corporate, and nonprofit work environments, as well as leadership styles and competencies. Relevant issues related to women and ethnic minorities will also be discussed. The course includes readings and dynamic discussion, debate, role-play scenarios, and real-world visibility and exposure to leadership with distinguished course co-instructors, and guest speakers from academic, health care sector, and corporate leadership contexts.

01:090:101 section 24 index 05266

Making a Difference: Nonprofit Leadership in Sub-Saharan Africa
Ronald Quincy (School of Social Work)
Conrad Person (Senior Director Ret., Corporate Contributions, Sub-Saharan Africa, Johnson & Johnson)

In this seminar students will work on capacity building projects with the co-instructors to support several civil society and nonprofit organizations in Kenya. Students will engage with the Mandela Washington Leadership Fellowship Alumni on their Civil Society Organization Projects in Kenya through the use of electronic media (e.g. Skype). The seminar will engage students with Johnson & Johnson leaders based both in the U.S. and in sub-Saharan Africa about best practices in managing and leading African Civil Society Organizations. Students will take a trip to the U.N. to attend an international conference related to African Civil Society Organizations.

01:090:101 section 76 index 17954

For more than 120 years, Rutgers, The State University of New Jersey, and Johnson & Johnson have partnered to advance academic, research, and community service endeavors. Building on this long-established relationship and legacy of leadership, these special co-taught seminars by Rutgers faculty and Johnson & Johnson professionals will enhance the learning experience of students from multi-disciplinary areas of study. This initiative expands research ties, while introducing first-year students to an array of career and educational opportunities. Students will explore areas of common interest to both Rutgers and Johnson & Johnson, including global public health, health and wellness, ethics, community and leadership.
Up and Down the Streets of the Metropolis
Andrea Baldi (Italian)
The seminar addresses the representation of walking in Western cultures. Rooted in the everyday, in ordinary gestures, the experience of walking is pivotal to the shaping of our experience of place. Strolling relates to our most immediate way of staying in the world, examining and describing it, in the wake of modernity, the new urban subjects have fashioned walking as a style of apprehension and appropriation of their surroundings. Through their “rhetoric of walking,” their choices of itineraries, passers-by devise their own maps of the city, appropriating its spaces. As it constitutes a primary way of relating to others and perceiving the environment around us, walking is a recurrent motif in literary and cinematic texts. Since antiquity, this practice has been prominently recorded in literature as a paradigm of a dynamic relationship with the outside world, often leading to detachment from the mundane sphere, and prompting reflection and introspection. Such observation of our living space is culturally encoded and, with its shifts and transformations in the course of time, reflects changing attitudes and customs, highly influenced by social and economic factors. Walking through the city is also, and foremost, codified by gender, as demonstrated by the various models of flânerie, in which the gender identity of the passer-by shapes the observation of urban space. Walking sets in motion essential processes regarding reflection, knowledge, and writing. It is, ultimately, a call to participation in the world, as well as a process of cognitive discovery, moving from the outside to the inside. In the seminar we will explore these fascinating issues, analyzing an array of captivating literary and visual texts. Among others, we will use kits to build our own ukulele and learn to play our instruments. A visit to a ukulele workshop may also be arranged. All students will leave the seminar with their very own handmade instrument, the ability to play the ukulele, and the understanding of how project-based learning enhances and encourages thinking across disciplinary boundaries. This seminar is specifically designed for those with no knowledge of the ukulele. No previous musical knowledge needed.
01:090:101 section 13 index 09992

Music, Sound, and Landscape
Anette Freytag (Landscape Architecture)
Scott Ordway (Music)
The natural world has always been a primary source of inspiration for musicians. In recent years, composers have continued this tradition by creating powerful works in response to contemporary environmental issues such as global warming, carbon emissions, and wilderness conservation, among others. In this seminar, which is led jointly by composer Scott Ordway and scholar, educator, and critic Anette Freytag, students will listen to and discuss classical and contemporary vocal and instrumental works that address and celebrate humanity’s efforts to live in harmony with the natural world. They will furthermore investigate how video, sound recordings, and digital tools of analysis and fabrication can change both the perception and the representation of our environment. They will get insight in how to use these tools for their own research, compositions, and designs.
01:090:101 section 47 index 05271

UKE: Understanding, Knowledge, and Engagement through ‘Ukulele Project-Based Learning
Stephanie Cronenberg (Music)
What connects Portugal, the Beatles, Jack London, and Spongebob Square Pants? The ukulele! In this interdisciplinary seminar, we will experience project-based learning first hand as we think and discuss about how the ukulele connects to subjects in the humanities and sciences. Together, we will use kits to build our own ukulele and learn to play our instruments. A visit to a ukulele workshop may also be arranged. All students will leave the seminar with their very own handmade instrument, the ability to play the ukulele, and the understanding of how project-based learning enhances and encourages thinking across disciplinary boundaries. This seminar is specifically designed for those with no knowledge of the ukulele. No previous musical knowledge needed.
01:090:101 section 13 index 09992

Sounding Play: Acoustic Ecology of Sports and Games
Eduardo Herrera (Music)
The intimate silence of the tennis court interrupted by a player’s grunt; the focused listening of a double Dutch jumper with ropes that move too fast to see; the country music song playing in the pickup truck you rode in a video game; charting with 40,000 other fans against the wrong call the referee’s whistle just signaled. Sound is an essential component of sports and games. Both as players and spectators, people engage in listening, charting, speaking, noise-making, music-making, and even staying silent as part of an auditory ecology that is intimately tied with the immersion, flow, and ultimately, the success of the activity. In this course we will explore a series of case studies within the game-sport continuum that address important questions about gender, race, social experience, and the nature and potentials of participatory sound making. These will include charting and crowd noise in stadium sports (soccer, football, tennis), double Dutch rope-skipping, diegetic and non-diegetic music in open-world action games (“Grand Theft Auto,” “Lord of the Rings Online”), sound-driver designer board games (“Space Alert,” “Escape: The Curse of the Temple”), the sound crisis of motorsports (Formula 1 and Formula E), and music-rhythm games (“Guitar Hero,” “Rock Band,” and “Dance Dance Revolution”). Sound’s present, becomes the basis for deep, intimate connections among and across players, gamers, and audiences.
01:090:101 section AB index 09986

The Problem of Evil in Philosophy and Popular Culture
Trip McCrossin (Philosophy)
The problem of evil, as Susan Neiman has described it, is the particularly difficult to satisfy “need to find order within those appearances so unbearable that they threaten reason’s ability to go on,” as when (at times incomprehensibly) bad things happen to (at times relatively) good people, and (at least relatively) good things to (at times incomprehensibly) bad people. Central to her watershed perspective on the problem are two related propositions. She proposes, on the one hand, that midway through the Enlightenment, the problem of evil developed, in addition to the traditional theological version—according to which human reason strains, in the above “find order” spirit, to reconcile conscious human suffering with faith in divine wisdom, power, and benevolence, which either makes or allows it to happen—a more secular version as well. Here, while it’s no longer in response to suffering’s ostensibly divine origin, reason strains similarly nonetheless, so much so as to call into question, as the theological version does already, reason’s very ability to make the order it so fervently desires. She goes on to propose, on the other hand, that in response to both versions of the problem primarily two competing perspectives arise, which competition defines us all today, beginning with the public rivalry between Rousseau’s and Voltaire’s, the former insisting that “morality demands that we make evil intelligible,” the latter that “morality demands that we don’t.” The seminar is designed to have participants work together to identify and elaborate the various ways in which these competing perspectives endure in philosophy and popular culture.
01:090:101 section 59 index 06155
Looking East: A Different Way of Learning Dance, Language, Traditional Arts and Cultures through Movement

Paul Ocampo (Dance)
Chien-Ying Wang (Dance)

This course will investigate various dances, traditional arts and culture of Taiwan, the Philippines, and neighboring countries. Through the language of dance, students will learn traditional arts and cultures using practices and modality that are fun, interactive, and informative. This seminar is designed for students who want to expand their understanding of dance as an emblem of cultural identity and an expression of social order. Along with the practice of dance, we will experience how to prepare traditional foods associated with respective festivities. The food serves as a conduit for a holistic experience to deeper comprehension of Asian cultural arts and heritage. This seminar will include a field trip to New York City.

Dance Improvisation: Learning Tools for Choreography and Performance
Julia Ritter (Dance)

This seminar will provide students with an introductory experience of dance improvisation as a skill for developing choreography and performance. Students will explore a range of physical exercises yet no previous training in dance nor special attire is required; sweatpants and t-shirts are acceptable. Students will learn how to develop multidisciplinary approaches to dance improvisation that can be deployed when creating choreography for the stage, when organizing flash mobs, and/or devising other performance events. Building upon body, space, time, energy and relationship as the core conceptual elements of dance, students learn strategies for generating movement vocabularies from a variety of inspirational sources including sound, visual art, dramatic situations, and architectural design, among others. The seminar includes a field trip to a performance in New York City.

Rockin’ Roots, Global Reach: The Story of Jersey’s Popular Music
Jonathan Saucedo (Rutgers Libraries)

Frank Sinatra, Whitney Houston, and Bruce Springsteen are just a few of the artists who have called New Jersey home. But for centuries the state has been fertile ground for musical creativity. In this course, we will work with Rutgers’ incredible, rare, and unique New Jersey sheet music collection that makes the materials freely accessible and comprehensible around the globe. Students will learn about New Jersey politics and popular music culture in the 1800s and early 1900s. Each student will choose a piece of sheet music, digitize it, and create a finding aid that includes an explanatory essay, which will place the item in its sociopolitical and cultural context. The finding aids will be edited and published online, providing students a clear outcome and showing them that their research can have real world implications. The class will include a field trip to the largest jazz archive in the world, the Institute for Jazz Studies in Newark.

Social Engagement in XR (Extended Reality)
Richard Anderson (Division of Continuing Studies)
Daniel Swern (Dance; SOC)

Cities face challenges when it comes to messaging about available social services, historical curiosities, and creative culture. Community access isn’t necessarily limited by financial or bureaucratic barriers, but through wayfinding and navigation due to poor signage or a dearth of public information. Through web-based tools in XR (extended reality, inclusive of augmented and virtual reality), our smartphones can give us the ability to immediately reveal resources hidden in plain sight as well as provide on-the-fly context and insight for both our built and natural environments. XR integrates real world experience with virtual world access. When produced as a robust community-based ecosystem, XR adds another layer of texture to the places where we live and work, and fundamentally changes the way we think about a traditional neighborhood. By using the mobile camera to frame and interact with the world, we’re helping people frame and interpret what they are seeing. Through the use of game mechanics and incentives, we’re enhancing and encouraging exploration and fighting isolation between individuals. Students will learn augmented reality 3D-modelling and game development in Unity (ubiquitous developer software), and meet with New Jersey community and nonprofit leaders to marry their applied technical and creative skills with real world service access needs. Deiner Park on College Avenue Campus will serve as the real world workspace for XR development as it is public space right on campus that represents a convergence of unique creative, environmental, residential, transportation, and service access challenges and opportunities to be explored in the technology lab.

"Inner Engineering" for Wellbeing and Thriving in College, Work, and Life
Tracy Chang (School of Management and Labor Relations)

"Inner Engineer" is a comprehensive science-based yoga and meditation program designed by Sadhguru (2016). The program equips one with effective tools to build competence in self-mastery of mind, body, emotion, and energy. With this self-transformation, students will be energetic, joyful, mindful, healthy, and fully functioning and realize their highest potential in college, work, and life. Students will learn the Inner Engineering tools and learn about the research project that examines the effect of the tools on employee wellbeing and engagement in the workplace. Students will read the book "Inner Engineering" and keep a reflective journal weekly and engaged in didactic inquiry in class.

Talking Politics: Disagreeing Without Being Disagreeable
Randi Chmielewski ( Eagleton Institute of Politics)
Elizabeth Mattio (Eagleton Institute of Politics)

In order for democracy to work, citizens need to be able to talk to each other. Addressing public policy challenges such as stable economic growth, health care, and college affordability requires reasoned deliberation, critical thinking, and open and civil discourse. Unfortunately, such models of political discussion are few and far between in contemporary American politics. This seminar considers why engaging in honest but civil political discussion is integral to American democracy’s success and explores productive ways to go about it. Topics that we’ll consider include: What are the effects of adversarial political interactions on the political process? What steps can be taken to ensure that political discussions are productive? How can we have respectful and honest conversations about public problems and their proposed solutions when we disagree? Students will be exposed to a range of examples of political deliberation (some contemporary and some historical), will witness models of political discussion regarding current policy issues, and will be offered opportunities to build their own skills in political discussion.

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01:090:101 section 04 index 09068

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01:090:101 section 04 index 09068

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01:090:101 section 60 index 07290
Resilience, Research, and Relationships
Caroline Claus-Ehlers (Education Psychology)

No matter who you are or where you come from, your life is bound to be crowded with challenges. How do individuals successfully overcome challenges? This is the central question of resilience research, research on how people “bounce back,” adjust to change, and overcome adversity. This research shows that having just one important personal relationship is the most important factor that promotes individual resilience. In this seminar, we will explore resilience and relationships in the lives of students. After briefly reviewing the history of resilience research, including the professor’s own investigations in this area, our class discussions will connect resilience research with many types of relationships: mentors and peers in college, family relationships, relationships at work, and romantic relationships. We will also touch on resilience and gender identity.

01:090:101 section 17 index 05262

Yankee Stadium
Teresa Collins (Thomas A. Edison Papers)

Why did the Stadium cross the road? In this seminar we develop multiple perspectives on the history of Yankee Stadium and its epic journey from “The House that Ruth Built” to its current home in the Bronx, New York. We will observe and analyze a number of related themes and issues, including relationships between public finance, private enterprise, and urban development. The flexible, situational character of change and tradition is examined as well. Students will explore potential topics and methods for their own research development.

01:090:101 section 14 index 05261

Fundraising Principles: Raising Money for Good Causes
Richard L. Edwards (Chancellor Emeritus and University Professor)

How do nonprofit organizations raise money? In this seminar, you will gain knowledge and skills to help lead student-sponsored fundraising events on campus, in your community, and beyond. Building on fundraising experiences you may have already had in community, school, or faith-based organizations, this seminar will introduce you to the basics of fundraising theory and practice, including special-event planning, individual solicitations, and telephones. Participants will benefit from Rutgers fundraising experts and guest speakers. The seminar includes discussions, role-playing, and presentations, and the class will review fundraising events that have been successfully implemented by local nonprofit and public charity organizations.

01:090:101 section 10 index 17319

Immigration, Diversity and Student Journeys to Higher Education
Peter Guaraccia (Human Ecology)

Several recent studies have found that immigrant students perform better than U.S.-born students in college. What drives immigrant students to succeed in higher education? One factor appears to be the skills immigrant students learn while balancing keeping their family cultures alive and learning U.S. culture. Another is the “immigrant bargain” that forms between parents who sacrifice to bring their children to the U.S. for educational opportunities and the drive of immigrant students to succeed as a result. We will look at a range of research and popular literature on this topic. We will especially focus on a book Dr. Guaraccia recently published on this topic based on a study of immigrant students at Rutgers. The book incorporates a mix of qualitative and quantitative methodologies to provide a rich portrait of student experiences across the full diversity of Rutgers University.

11:090:101 section 15 index 08352

Artists and Politics: The Intersections of Policy and Art in the 20th and 21st Centuries
Donna Gustafson (Zimmier Art Museum)
Hal Saltzman (Planning and Public Policy)

This seminar will examine major American political controversies such as migration, war, urban transformations and gentrification, race, and globalization through the lens of photography, film, and other visual arts. The seminar explores Art (Gustafson) and Public Policy (Saltzman) to examine how current policy issues have been and are represented in visual arts. We contrast contemporary policies and art with representations in the past. For example, how the arts reflected/were used in Vietnam war policy debates and protests, as contrasted to visual representations of American reactions to the Iraq/Afghanistan wars; of the “Great Migration” of African-Americans to the North and the transformation of urban centers in industrialization and then deindustrialization, of suburbanization (e.g., through the works of Bill Owens), and then the movement to urban gentrification (e.g., works of Martha Rosler of Greenpoint, Brooklyn); of the 1960s’ 70s protest movements as compared to contemporary protest movements such as Occupy Wall Street, Women’s March, and Black Lives Matter; and Cold War art/politics and contemporary global politics and art addressing contemporary issues such as UN development programs.

01:090:101 section 56 index 08218

Criminal Court War Stories
Milton Heumann (Political Science)

We begin with reading a journalistic account of criminal justice in Chicago. This is followed by a more general discussion of criminal justice across many cities. Next a prosecutor, defense attorney, and judge speak to the seminar and share their experiences with particular emphasis on their most memorable cases and with their most poignant insights from their careers working in the courts. Students have the opportunity to carefully question the speaker, and test hypotheses derived from the readings against the speakers’ experiences.

01:090:101 section 33 index 05269

Prosecution: Practice, Ethics and Justice
Elie Honig (Executive Director, Rutgers Center for Critical Intelligence Studies)

This course focuses on the role of the prosecutor both as a protector of the community and as an agent of social justice. At every step of the criminal justice process—from investigation to arrest to plea bargaining to trial sentencing—the prosecutor must make critical choices. Every one of these choices impacts not only the criminal justice system but also the citizens who face incarceration and the families and communities who rely on those citizens. This course examines how a prosecutor can do his or her job both with a passion for justice and with compassion for the people and communities impacted by the justice system.

01:090:101 section 11 index 05260

Getting It Done: Managing Information for Better Performance
Triveni Kuchi (Rutgers Libraries)

With emerging information and communication technologies, the plethora of information constantly generated is overwhelming. Such an information environment directly affects the way you discover, keep, use, or reuse information for your research. How do you manage your bazillion files? What organizing schemes or strategies for managing information are out there? What works, what doesn’t, and why? This course will focus on understanding what information management entails; and how it requires an active, deliberate selection among alternatives, and a critical and habitual pursuit of analyzing and re-categorizing information. Through readings, class discussions, hands-on labs, and guest speakers, students will reflect, analyze, compare and use information organizing schemes or tools for managing a variety of different types of information. Final presentations will allow each student to creatively explore particular information management tools that are used at either the organizational or the individual level in more detail.

01:090:101 section 53 index 17240
Collaboration for Learning and Performance

Angela O’Donnell (Education Psychology)

This course will introduce you to collaborative and cooperative learning. We will explore ways to create successful learning and work teams. The content of the course is intended to provide some practical help to people who wish to use cooperative and collaborative learning in their classrooms or in other situations. We will explore what it means to be collaborative or cooperative and what impediments there might be. The primary focus of the course is on understanding why one might use cooperation or collaboration by examining underlying theory that might inform practical choices. The course will explore the journey towards a cooperative spirit and the outcomes that can result.

01:090:101 section 68 index 09077

Media in the Digital Age

John Pavlik (Journalism and Media Studies)

Understanding the nature and impact of digital technology on media and society is the focus of this seminar. Students examine the changing nature of media in the digital environment, including social media, and their consequences, especially implications for civility, democracy, journalism, and beyond.

01:090:101 section 16 index 09988

Urban Adventure

Michael Rockland (American Studies)

Adventure is usually associated with escaping community, leaving civilization, and “entering nature,” in part because of the common view that human beings are separate from nature. In this course we will assume the contrary—that the environment humans have built—cities, highways, bridges—is part of nature and also can be places of adventure and wonder. Reading select chapters from books of mine such as Looking for America on the New Jersey Turnpike and The George Washington Bridge: Poetry in Steel, as well as from my book improbably titled Snowshoeing Through Sewers, as well as seeing the movie in which two Rutgers professors (my friend and I) canoe through central New Jersey to Manhattan, we will plan our own field trip, probably including hiking across the George Washington Bridge, Brooklyn Bridge, and a chunk of historic Manhattan. The goal here is to learn some interesting stuff and to have fun, but also to engage our imaginations in relation to our immediate surroundings and environment and to see the familiar world with fresh eyes.

01:090:101 section 75 index 11132

Culture Games: What Do Major Sporting Events Tell Us about Society and Culture

Mark Schuster (American Studies, Dean for Graduate Student Life)

American spectacles surrounding sports, athletes, fans, and their hero(ines) have articulated an exhilarating and complex narrative of American culture. What role does athletics play in a college education? What do major sporting events tell us about our American identities, communities, culture, and society? A variety of sport controversies will be examined such as steroid use, body fascism, violence, power, and the role of media and the NCAA in American athletics. Sport spaces, the intersections, and assumptions of class, ability, race, gender, and sexuality and social change will be scrutinized.

01:090:101 section 82 index 09079
The American Governor: Dealing with Disaster
Kristoffer Shields ( Eagleton Institute of Politics)

As the chief executives of their states, governors shape policy, set the state agenda, and act as their state’s representatives in the public eye. Put simply, the governor is usually the most important and powerful person in the state during his or her term(s) in office. No wonder, as we look ahead to 2020, that governors and former governors will once again be on the short list of potential presidential candidates. Of all the tests a governor can face, however, perhaps none is as important—and difficult—as dealing with the after-effects of a natural disaster. Hurricanes, fires, and floods can be unpredictable, but the importance of a governor’s performance in the aftermath of such an event is certain. This course will begin with a quick look at the office of the governor in general: What is a governor? How do gubernatorial powers differ from state to state? And what role does the governor play in the U.S. federal system? We will then move on to look at this central example of a governor’s power and responsibility: shepherding his or her state through the trauma of a natural disaster. We will use a series of three case studies to research and examine a governor’s range of options in such a challenge, culminating with a long look at our own state’s experience following Super Storm Sandy. We will hear from the people who were involved in the recovery efforts, analyze the political and real-life effects of their decisions, and research what works and what doesn’t when a governor is forced to become the “consigliere-in-chief”.

01:090:101 section 84 index 09081

Visualizing Data to Tell a Story
Anselm Spoerri ( Communication)

Students will learn about the principles and techniques necessary to tell a story using data visualization tools. They will analyze examples of visual data stories and learn to create effective visualizations using tools and engaging data story. They will analyze examples of successful visual data stories and learn to create effective visualizations using tools and engaging data story. Students will learn about the principles and techniques necessary to tell a story using data visualization tools. They will analyze examples of visual data stories and learn to create effective visualizations using tools and engaging data story. In this course, we will develop an understanding of information as a commodity, with a richly contested value for both individuals and societies. This course will engage with different types of information inequalities, such as those between economically rich/poor societies, as well as situations where information is restricted or censored. From the level of societies, information is politically and economically charged. The ubiquity of information technology in the West makes it easy to overlook the persistence of vast areas of information poverty in the world. This global digital divide of access to technology and information literacy, continues to threaten human rights, development goals, and political stability. Information also has a private and personal value. We will examine case studies of how governments and corporations quantify information and what this means about our own information “worth.” In addition to class discussions, we will develop information literacy skills and use scholarly resources available through the Rutgers University Library to explore these topics.

01:090:101 section 31 index 05268

American College Life for First Year International Students
Dake Zhang ( Education Psychology)

Have you ever experienced any culture shock during the first year at Rutgers? In what ways is the college experience in the United States different from the experience if you studied in your home country? What do you expect from your college experience here and how do you look at the challenges that you will face? In this course, we will share our personal experiences, difficulties and our coping strategies. Topics to be discussed in this course include: speaking English as a second language, academic opportunities and challenges, American food, housing and transportation, campus safety, sexual and physical harassment, social experiences, and employment opportunities. Students taking this seminar will receive a hands-on exposure to C++ programming, Linux kernels, and a different view of the design, fabrication, and programming of intelligent systems starting from scratch.

01:090:101 section 06 index 07266

Launching Your Successful STEM Career
Andrew Baker (Physics and Astronomy) Charles Keeton (Physics and Astronomy)

Science, Technology, Engineering, and Mathematics (STEM) fields offer exciting opportunities for careers of discovery, innovation, and helping others. But how does one prepare for and achieve such a career? In this seminar, students will learn about the critical role played by research in STEM fields, the skills and qualities that are valuable in research (e.g., programming, teamwork, communication, and persistence in the face of obstacles), and the practical steps they can take at Rutgers to foster success in STEM majors and careers. Students will interact with guest researchers from multiple STEM fields, explore the life stories of STEM professionals like 2015 Presidential Medal of Freedom winner Katherine Johnson and 2016 Rutgers honorary degree recipient Jocelyn Bell Burnell, and receive training in basic programming in the Python language. As a final project, students will work in teams to reproduce some of the calculations made by Johnson and others to help launch NASA rockets as part of the Mercury, Gemini, and Apollo programs.

01:090:101 section 21 index 05265

Information Inequality
Lily Todorinova ( Rutgers Libraries)

In this course, we will develop an understanding of information as a commodity, with a richly contested value for both individuals and societies. This course will engage with different types of information inequalities, such as those between economically rich/poor societies, as well as situations where information is restricted or censored. From the level of societies, information is politically and economically charged. The ubiquity of information technology in the West makes it easy to overlook the persistence of vast areas of information poverty in the world. This global digital divide of access to technology and information literacy, continues to threaten human rights, development goals, and political stability. Information also has a private and personal value. We will examine case studies of how governments and corporations quantify information and what this means about our own information “worth.” In addition to class discussions, we will develop information literacy skills and use scholarly resources available through the Rutgers University Library to explore these topics.

01:090:101 section 87 index 09082

Computational Design and Fabrication of Intelligent Systems
Mridul Aanjaneya ( Computer Science)

Modern computing has become ubiquitous and affordable thanks to the favorable scalability predicted by Moore’s Law. Indeed, the computing power available on a state-of-the-art desktop workstation 15 years ago, costing at least $3000, is now available on a chip that fits in the palm of one’s hand and costs less than $60. This, in conjunction with the widespread availability of smart, low-cost sensors that can be interfaced with such computing chips, provides the opportunity to introduce a much broader audience to advanced computer programming, with applications in machine learning, computer vision, and robotics, in a very intuitive and accessible manner. We have all been fascinated with the idea of building robots since our childhood, and now these computing chips and sensors, in combination with rapid prototyping devices such as 3D printers, make it possible for novice users to make their favorite toys come to life! This seminar will introduce students to modern computing boards, such as the Arduino, Raspberry Pi, and BeagleBone Black, as well show through hands-on exercises how to interface them to various sensors, servo and DC motors, etc., while focusing on hardware efficiency and object-oriented programming. Students will be introduced to the Makerspace, a collaborative facility maintained by the Division of Continuing Studies (DCS) that has been specifically designed for students, faculty, and staff from all academic disciplines who love to learn, design, and create. Students taking this seminar will receive a hands-on exposure to C++ programming, Linux kernels, and a different view of the design, fabrication, and programming of intelligent systems starting from scratch.

01:090:101 section 89 index 11062
Beyond the “Big Bang Theory”: the Real Scientific Experience
Albyn Brooks (Physics and Astronomy)

Ever wondered what the life of an astro/physicist is really like? It’s not what you see on “The Big Bang Theory,” and it rarely involves white lab coats. Real scientific research is a highly creative, interactive process that requires scientists to constantly collaborate in order to problem solve and develop new ideas (and frequently involves travel to accomplish this). Come experience it for yourself! In this seminar, students will experience the process of research firsthand. You will learn basic skills to prepare you to participate in research for the remainder of your undergraduate studies and beyond. Those skills (e.g., an introduction to scientific computing, using basic programming to plot data, how to read a scientific article) will be applied to a short, five-week research project of your choosing, led by mentors in the Physics and Astronomy Department. Students will also learn to present their research, both to a scientific and a general audience. Students will get to know each other through both casual and work interactions, including a visit to the Hayden Planetarium at the American Museum of Natural History in New York City.

01:090:101 section 91 index 14686

Trees, Your Campus, and the Environment
Jason Grabosky (Ecology, Evolution, and Natural Resources)

Each week we meet on one of the Rutgers New Brunswick campus locations by a bus stop and walk around to explore the natural spaces and specific trees as individuals and as varied species of specific function. We use each campus as a thematic setting to discuss tree biology, design/cultural symbolism in tree use, the linkage between tree species and environment or products developed from specific trees. We’ll collectively “meet” and learn about some of the 150+ tree species making up the Rutgers campus community and adjoining parks.

11:090:101 section 07 index 12607

The Wonder of the Human Machine
Joseph Freeman (Biomedical Engineering)

The human body is an amazing machine that has an amazing level of organization starting at the molecular level and continuing to the tissue and organ levels. In this class students will be introduced to the inner workings of this machine from the molecular to the tissue level. In addition we will discuss ways biomedical engineers are taking aspects of this organization and using it to build and replace tissues to improve the quality of life of victims of trauma and disease.

01:090:101 section 70 index 16937

Permaculture: Integrating Land, Resources, People and the Environment
Anita Balshi (Landscape Architecture)

Permaculture involves creating integrated systems of food production, housing, sustainable technologies, and community development. Originally conceptualized as an approach to creating permanent agriculture, the permaculture movement has developed into a whole systems approach with concepts that can be applied to social, cultural, and economic systems. Permaculturists today include not only farmers, but also community organizers, social workers, and software developers. Beyond food systems and ecological design, permaculture principles can be used to rethink the built environment, business models, and decision-making processes. Seminar sessions will include: lectures and documentary films about inspiring permaculture projects from around the world; class exercises that will help you feel empowered to make change; and short skill sessions. You will learn to apply small-scale interventions: use cardboard and old newspaper to sheet mulch, calculate rainfall on your roof and find ways to collect it, find healthy wild food and medicine, set up a currency-free barter market, and begin to compact—even if you have only the space under your kitchen sink to do it.

11:090:101 section 03 index 05686

The Doctor Is In: Malevolent and Magnificent Microbes
Joan Bennett (Plant Biology and Pathology)

Microbes are organisms too small to be seen by the naked eye. The best known causes diseases but most microbial species are an essential and beneficial part of the living world. The course will discuss the role of selected microbial species 1) diseases in human history (e.g., plague, syphilis, tuberculosis); 2) foods (e.g. bread, miso, yogurt) and beverages (e.g. beer, wine) fermentations; 3) sources of biologically active chemical compounds (e.g. hallucinogens, penicillin, streptomycin); and 4) processes (e.g. biodeterioration).

11:090:101 section 10 index 14687

High-Tech Sustainability: Food for Thought
A.J. Both (Environmental Science)

We all need (and love) to eat. But do you ever stop and think: how is your food produced and where does it come from? How can we maintain a safe and year-round supply? In this course, we will look at ways in which we can use technology to create more sustainable systems of agriculture. In particular, we will investigate the challenges and opportunities associated with greenhouse production. Students will be exposed to greenhouse crop production, review and discuss the necessary inputs required for greenhouse production, complete a writing assignment and make their own presentation discussing a topic related to greenhouse production.

11:090:101 section 01 index 05685

The New Theory of Human Memory
Arnold Glass (Psychology)

Ask me to tell you the story of my life, and I will weave an answer based on what I best remember of my experiences. But are all of my memories true? Did they really happen? Thirty years ago human memory was believed to be the result of some sort of recording device in the brain. We now know that autobiographical memory is a narrative that is constantly being rewritten. So, some of our memories of past experiences are in fact false. In this seminar, we will examine the popular theories of memory of the past hundred years and the scientific evidence of today. We will consider the new view of memory as something malleable and its implications for society.

01:090:101 section 28 index 05267

Eliminating Cancer: Novel Targets and Therapeutic Approaches
Sunita Chaudhary (Rutgers Cancer Institute of New Jersey)

In this seminar learn how the most recent discoveries through cancer research are being translated into cutting-edge treatments for cancer patients. New approaches utilizing computer-assisted diagnostics, medical imaging and statistical pattern recognition allow for a more accurate diagnosis of a range of malignancies. Comprehensive genomic profiling of tumors through next-generation sequencing technologies offers the promise of personalized cancer therapy with targeted drugs. We will discuss the innovative immunotherapy approaches that are being utilized to harness the immune system in the fight against cancer and translational clinical trials that are being tested to study novel drugs in patients.

01:090:101 section 12 index 09069

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01:090:101 section 70 index 16937
Brunswick, Body and Bikes
Julia Grimes (RW-General Internal Medicine)
Sue Shapses (Nutritional Sciences)

While many know that healthy living and physical activity play important roles in the academic achievement of students, adjusting to life as a first year college student can be challenging. Unfortunately, poor eating habits and decrease in physical activity are not uncommon. The objective of the seminar is to promote health and wellness by understanding nutrition, and body composition to maintain proper body weight, lean body mass and bone health. We will engage cycling because it is an effective low-impact way to stay fit and healthy by providing benefits such as increase strength and endurance as well as decreasing fat. Furthermore, bike-friendly communities have higher levels of mental health and well being. In addition to recognizing cycling impact on transportation, cycling safety and skills and planning will be explored. We will help students develop critical and analytical thinking skills on related health topics.

01:090:101 section 02 index 06130

The Raritan: A River and a Watershed
JeanMarie Hartman (Landscape Architecture)

The Raritan River is interwoven with the history and development of this region. The river creates a boundary between our campuses. But the watershed of the river gives form to our local history and settlement patterns. This course will begin to disentangle the interactions between land use, human settlement patterns, and the Raritan River. We will use tools such as field trips, maps, and historic documents to understand the synergies of the interactions.

11:090:101 section 15 index 08606

The Function of Love, Work, and Knowledge in Organic Food and Farming Systems
Joseph Heckman (Soil Science)

Nurturing the linkage between healthy soils, plants, animals, and people was the original motivation for organic agriculture. While its modern market share and organic certification is celebrated as the result of a phenomenally successful movement, others bemoan the discontents of industrialization. As a mechanical attitude towards life infects all of culture, organic agriculture provides excellent background and preparation for students interested in pharmacy, medicine, nursing, or parenting. While many know that healthy living and physical activity play important roles in the academic achievement of students, adjusting to life as a first year college student can be challenging. Unfortunately, poor eating habits and decrease in physical activity are not uncommon. The objective of the seminar is to promote health and wellness by understanding nutrition, and body composition to maintain proper body weight, lean body mass and bone health. We will engage cycling because it is an effective low-impact way to stay fit and healthy by providing benefits such as increase strength and endurance as well as decreasing fat. Furthermore, bike-friendly communities have higher levels of mental health and well being. In addition to recognizing cycling impact on transportation, cycling safety and skills and planning will be explored. We will help students develop critical and analytical thinking skills on related health topics.

11:090:101 section 06 index 08206

Medicine: Discovering and Evaluating Commercials and Study Information
Evelyn R. Hermes-DeSantis (Pharmacy Practice and Administration)

In this course, students will be exposed to discovering and evaluating the information provided in medical commercials and headlines of the day. When you see the latest weight loss ad, what does it really mean? When you see the latest headline declaring that coffee is or is not good for you, how do you know what the information is based on? Students will explore how to critically evaluate information that impacts everyday life.

01:090:101 section 34 index 14678

Pollinators and Garden Design
Christina Kaunzinger (Landscape Architecture)
Kimberly Russell (Ecology, Evolution, and Natural Resources)

Explore the relationship between pollinators and garden design in the newest campus Living Lab. Can plantings at home, at work, and on campus enhance pollinator abundance and diversity? Do some gardens support more pollinators than others? Students will address these questions by monitoring plots installed by the Landscape Architecture Planting Design Course in the Living Labs complex located around the Institute of Food, Nutrition, and Health on the Cook/Douglass campus. Class time will focus on active learning experiences: pollinator observation in the field, plant identification in the lab, data analysis in Excel, and creation of communication products.

11:090:101 section 23 index 11063

Kids and Medicine
Katelin Kimler (Pharmacy Practice and Administration)
Pooja Shah (Pharmacy Practice and Administration)

Everyone remembers receiving medicine when they were children—maybe it was amoxicillin for an ear infection or maybe acetaminophen for a fever. But how do medicines that were originally designed for and tested on adults work on children, an incredibly diverse population weighing anywhere from 1/4 lbs to 200 lbs? How can we give small children medicine that is only available as a tablet? How do we administer medicines intravenously in tiny doses to premature infants? How are dosages determined when there is no way to perform drug trials on children? In this seminar, we will explore the unique challenges of medication administration to children. Students will learn to think creatively about how to solve medication issues for children, providing excellent background and preparation for students interested in pharmacy, medicine, nursing, or parenting.

01:090:101 section 88 index 09083
Clean Energy
Lisa C. Klein (Materials Science and Engineering)
What is needed to improve the sustainable energy technologies we already have? What is needed to make new technologies practical and clean in the area of energy generation? We will explore energy storage in devices such as batteries and energy conversion in devices such as solar cells and fuel cells. We will talk about active research in new alternative energy materials and systems. In the lab, we will assemble and test our own dye-sensitized solar cells.
01:090:101 section 49 index 07289

Flying Faster Than the Speed of Sound
Doyle Knight (Mechanical and Aerospace Engineering)
On October 14, 1947, the sound barrier was broken for the first time in a manned level flight in the Bell X-1 piloted by Chuck Yeager. This remarkable achievement, due to the efforts of many engineers and scientists, marked the beginning of the age of supersonic aircraft. The seminar will examine the contributions of many of this era’s pioneers, including Ackeret, Busemann, Prandtl, Tupolev and many others. The crucial role of the development of turbojet and turbofan propulsion systems will be reviewed. Both U.S., European, and Soviet Union (now Russian Federation) aircraft will be considered.
01:090:101 section 72 index 08222

AI Through the Ages
Casimir Kulikowski (Computer Science)
Charles McGrew (Laboratory for Computer Science Research)
Humans are calculating species and we have been computing on our own for thousands of years. The Antikythera mechanism from around 100 BCE is the oldest known computer, used to predict astronomical events—an early example of artificial intelligence (AI) for timekeeping and navigation. Today, AI is being hyped as a panacea for solving a wide range of problems, from medical diagnosis to self-driving cars. AI has become known for its efficient machine learning techniques—but most of the examples are from artificial “big data” collections of images which only test whether 2D images can provide enough information at the pixel level to help recognize pre-defined and fixed categories of objects. This kind of AI is the subject of so much hype that many are wondering whether the next “AI Winter” will come soon—when enthusiasm and funding from industry and government dries up as a result of AI not delivering on its promises. The seminar will take a look at where AI came from, and just how far current techniques of AI can be pushed—whether or when they might hope to deliver on the “super-intelligence” claims that robots will outstrip humans in their intelligence in our lifetimes?
01:090:101 section 51 index 05272

The Arrow of Time: Studies of Decay, Entropy, and Timekeeping
Amit Lath (Physics and Astronomy)
In this seminar, we will investigate the concept of The Arrow Of Time by first understanding entropy. We will learn to use the Python programming language to calculate probabilities, and from that develop an understanding of entropy and the second law of thermodynamics. We will discuss the ideas of entropy and decay as they appear in literature and culture, including the hold they have in the collective imagination that leads to the rejection of quantitative metrics that show disease, war, and violence decreasing, and the average human condition improving. Finally, we will divide into groups to design and construct working time measurement devices. Using poorly available materials, the groups will make devices to measure one hour as accurately as possible. No clocks allowed!
01:090:101 section 58 index 11135

RUID! 3D Printing and the Future of How We Make Things
Howon Lee (Mechanical and Aerospace Engineering)
Three-dimensional (3D) printing is a manufacturing technique in which a 3D physical object is created by directly joining constituent materials. 3D printing has received significant attention in recent years due to its potential impact in industry, defense, healthcare, and even for hobbyists. This seminar series will introduce the principles of various 3D printing technologies, their capabilities and limitations, and emerging applications of 3D printing. In addition, recent implementations of 3D printing will be introduced including 4D printing and bio-printing. Students will have opportunities to use 3D printers to print their own 3D designs.
01:090:101 section 63 index 11058

Food Microbes: What and Where Are They?
Karl Matthews (Food Science)
This course provides a window into the world of food microbiology and food science. We will explore popular trends and myths related to food microbes. Discussions will center on topics including probiotics, double-dipping, food safety myths (e.g., the five-second rule), and how to avoid foodborne illness when traveling and in your residence. Finally, we will address the issue of food additives/antimicrobials in the context of food safety.
11:090:101 section 08 index 12308

Paperbotics and Art
Aaron Mazzeo (Mechanical and Aerospace Engineering)
Pulp-based paper has conveyed information with printed lettering, diagrams, and illustrations for hundreds of years. In these conventional formats, the flipping or turning of pages has required human manipulation. Recent research efforts are beginning to add life and active functionality to paper-based structures in the form of mechanical grippers, manipulators, and locomotors. In this hands-on seminar, students will review state-of-the-art research in paper-based robotics (i.e., paperbotics) and active origami, and then exercise creativity to build paper-based machines that will be capable of motion and interaction with humans. By also planning the aesthetics of their projects, participants in this seminar will go beyond building gadgets to craft functional pieces of art.
01:090:101 section 86 index 11061

Water Resources Engineering: A Close-up Look at the Raritan River
Monica Mazurek (Civil and Environmental Engineering)
Water quality science and engineering practices are based on measurement data and geospatial information systems and analysis. Water resources management, itself, depends on data, models, analysis of results and optimization of known or estimated system parameters. Understanding watersheds, and specifically the Raritan River watershed, requires integration of field observations, data, models, and critical evaluations of the combined field and modeled results. This seminar series introduces research methods used routinely in water resources practice and applies them to challenges concerning water quantity and quality using the Raritan River as the study location. The three field trips and seven lectures comprise this Byrne Seminar series providing examples of what water resources engineers and managers experience and the challenges they face.
01:090:101 section 78 index 14494

Humankind Is My Business: The Healthcare Executive
Michael J. McDonough (Health Services Administration)
Today, the American healthcare system is the subject of passionate debate and is changing more rapidly than almost any other field. Healthcare executives are the women and men who manage the changes. In their roles, they have an opportunity to make a significant contribution to improving the health of the communities served by their organizations. In this seminar, you will learn how and where healthcare services are delivered, who provides those services and how to pay for them.
01:090:101 section 90 index 09097

Medical Humanities
Michael McDonough (Health Services Administration)
This seminar will discuss the reasons why there is a healthcare system, why human beings care for one another and how the humanities plays a role in the delivery of healthcare services.
01:090:101 section 07 index 14493
**Hollywood Biotechnology, Fact or Fiction?**
Paul Meers (Plant Biology and Pathology)

Biotechnology has been perceived and portrayed in various ways by Hollywood and filmmakers around the world. In this course, we will explore the occasionally wide gap between public perception and the way science really "works." Students will view and discuss the portrayal of bio- and nanotechnologies in popular movies. Misconceptions and accurate portrayals will be analyzed to introduce students to a basic understanding of the latest exciting work in rapidly emerging areas such as genomics and epigenetics. Students will be given and overview of how some of these areas are being addressed in real research. Students will present science movie clips and thumbs up/thumbs down reviews on the science and the art as a required assignment.

11:090:101 section 09 index 05687

**Landscape/Seascape: An Interdisciplinary Exploration**
Holly Nelson (Landscape Architecture)
Gary Taghon (Marine and Coastal Sciences)

Stay the weekend at a Rutgers Coastal Experiment Station, and get a first-hand look at the New Jersey coast and how humans have changed it, guided by a marine scientist and a landscape architect. Since the earliest times of European colonization, humans have altered the landscape and seascape. New Jersey encompasses a range of coastal regions, from minimally to heavily altered. We will spend a weekend at the Rutgers University Marine Field Station, going on boat trips in Great Bay and Barnegat Bay. During these field trips, you will create a journal, comparing and contrasting the shorelines and the communities. In a subsequent meeting, we will place your observations into a historical perspective—for example, how and why have we changed the landscape and seascape and why are some regions more affected than others? We will also ponder how these environments might change in the future, in response to both increased human activity as well as climate change.

11:090:101 section 05 index 12606

**Closing the Gap: Women in Science, Technology, Engineering, and Mathematics**
Laura Palumbo (Rutgers Libraries)
Connie Wu (Rutgers Libraries)

Women have been historically underrepresented in the fields of science, technology, engineering, and math (STEM). Although women today are in leadership positions in STEM professions around the world, a gender gap still persists. This seminar will discuss the various reasons for the existence of this ongoing gender gap, and look at the sometimes little known contributions to STEM made by women in the past and present. We will hear from female professionals working in these fields, and take trips to University labs to meet with female scientists. This seminar will be of interest to students in STEM fields, history, journalism, communication, women’s studies, and business.

11:090:101 section 54 index 05274

**How to Win a Nobel Prize and the Diversity of Methods Needed**
George Piecznik (Biochemistry and Microbiology)

The professor teaching this course worked with all the pioneering Nobel laureates of Molecular Biology. He published with Francis Crick, co-discoverer of the structure of DNA, and Crick can trace his scholarly lineage back to Sir Lawrence Bragg, Nobel Prize winner for Physics (1915), who is responsible for the Bragg law of X-ray diffraction. He published with Sir Aaron Klug, who received the Nobel for optical diffraction and the structure of TMV and with Nobel laureate Sydney Brenner, who discovered mRNA. In this seminar, students will learn about the Bragg equation and simplify it so they can use it to decipher Photo 51. Students will measure parameters from Photo 51 and then re-derive the structure of DNA. An exciting hands-on component of the class will include a lab exercise where students use laser diffraction to determine helical molecular structure. Students will also learn the logic of how Fred Sanger, who received two Nobels, priced his RNA and DNA sequencing systems. This changed the whole landscape of science and medicine forever.

11:090:101 section 26 index 11064

**New Jersey’s Changing Climate: From Polar Bears to Palm Trees**
David Robinson (Geography)

With the devastation wrought by Hurricane Sandy earlier this decade, questions arose as to whether this is a sign of more severe weather to come. Recent years have also seen massive flooding in our river basins, the wettest two years in over a century (2011, 2018) and the warmest year (2012). Clearly something is happening to our state’s weather and climate, with several potential culprits to blame, foremost being the impact of humans on the regional and global atmosphere and landscape. This seminar will explore New Jersey’s weather and climate in the past, present and in the future. We will examine the physical system, look at the potential impacts of change on the state, and discuss what can be done to mitigate or adapt to future changes.

11:090:101 section 77 index 09078

**Global Environmental Health**
Mark Robinson (Plant Biology)

There are almost eight billion people in the world today and the population will grow to close to ten billion by 2050. Almost eighty-five percent of the population live in developing countries. One of the challenges for this ever-growing population is providing a secure food supply. We will discuss the trends in global food production and the technology used to increase global food supply. We will also explore the ever-growing global epidemic – while there are 800 million under nourished people in the world there is a larger number of people, close to 1.4 billion, who are overweight. Finally, we will look at the overall health of the global population, their jobs, their lifestyle, and the relationship to global environmental health issues, in particular those dealing with problems such as water and air pollution, food production and safety, and infectious and occupational diseases. Professor Robinson will share experiences from developing countries in Southeast Asia and West Africa. Case studies and current research will be used as illustrations.

11:090:101 section 16 index 14688

**The Self and Its Disorders**
Louis Sass (Clinical Psychology)

In this seminar, you will be introduced to current thinking about several personality disturbances or mental disorders that involve major alterations of the self or sense of identity: narcissistic, borderline, schizoid, and schizophrenic conditions. We will discuss theories from psychodynamic, cognitive-behavioral, and existential psychology. We will pay special attention to the perspective of the suffering individual, the possible relevance of modern and postmodern cultural factors, and the relationship between madness and rationality. The seminar offers an introduction to some key topics in contemporary psychiatry and clinical psychology.

11:090:101 section 46 index 09990

**Quantum Computing: Qubits, Entanglement, Cryptography, Black Holes, and Firewalls**
Stephen Schnetzler (Physics and Astronomy)

This seminar will introduce students to the ideas behind the coming quantum computing revolution. We will discuss foundations of quantum information including qubits, entanglement and modern interpretations of quantum mechanics; applications of quantum computing in cryptography and other areas; the technologies being explored for realizing quantum computing; and the quantum information aspects of black holes and gravity. In the seminar, we will discuss technical subjects but at the level of a Scientific American article. Students need only have some understanding of physics and math at the high school level.

11:090:101 section 83 index 09080

**Radioactivity: What it Means for You**
Stephen Schnetzler (Physics and Astronomy)

Radioactivity plays an important role in our everyday lives and impacts important societal decisions regarding our energy and climate future. It is important that the public be well informed about what radioactivity is and what its effects on us are. Despite its importance, there is a great deal of ignorance and misinformation surrounding it. In this seminar, we will explore the underlying nature of radioactivity. We will investigate its health and environmental effects and we’ll discuss what is its actual, as opposed to imagined dangers. We’ll also learn some little known, amusing facts about radioactivity such as where the helium in party balloons comes from.

11:090:101 section 81 index 14495

**Pets and Their Parasites**
Michael Sukhdeo (Ecology, Evolution, and Natural Resources)

Over the last decade, there have been many studies putting parasites into the context of ecological effects in ecosystems, and these new ideas have altered our thinking on the treatment of parasites. This course will focus on parasites of our pets and wildlife. It will consist of many field trips to domestic animal farms, ponds and streams to collect parasites. Samples will be returned to hands-on labs where students will learn standard parasitological techniques in worm recovery and identification, including necropsies and fecal analyses. Short mini-lectures will be used to elucidate new ideas on parasites in the context of natural systems and their basic biology.

11:090:101 section 14 index 08531
**First-Year: HUMANITIES**

**The Coinage of Ancient Rome in the Rutgers Collections**

T. Corey Brennan (Classics)

This seminar will offer an introduction to the coinage of ancient Rome, from its origins in the early 3rd century BCE to the 4th century CE. Students will develop research expertise through hands-on work in the Alexander Library with Rutgers’ Ernst Badian Collection of Roman Republican Coins (one of the best collections of its type in North America) and the University’s growing assemblage of Roman Imperial coins, and make a field visit to a comparable collection elsewhere. Participants will gain an understanding of general patterns of development in Roman money over a 700-year period, as well as contribute their own research on ancient coins that hold particular historic, economic or artistic interest, for possible publication on Rutgers’ web-based public numismatic portal.

**The Books That Make Us**

Marija Dalbello (Library and Information Science)

In this seminar, we will examine the life-stories of select monuments of writing, such as the Sumerian clay tablets, the original (Hokusai) manga, the Gutenberg Bible (the first major book printed with the printing press), and Carl Jung’s notebooks. We will consider their material life, the technologies necessary to produce them, and the meanings that they had for their contemporaries. How did people make these seminal works, and why? How do such important works help us make sense of our world? In what sense do these works represent revolutionary text technologies and how have they revolutionized the world of ideas? We will also think about writing itself as a technology that encompasses letters, drawings, graffiti, and illustrations; and learn how texts can be hand-written, painted, or inscribed, as well as mechanically and digitally produced. We will explore a wider context for circulation of books, texts, and reading across media forms. In order to view, mechanically and digitally produced. We will explore a wider context for circulation of books, texts, and reading across media forms. In order to view, handle and examine actual specimens, we will visit a rare books library in the area or New York City, and use the collections of the Zimmerli Art Museum at Rutgers.

**The Same Old Song: Influence and Allusion in Popular Music**

Christopher Doll (Music)

Is all pop music really the same? Are rock musicians more original than their pop counterparts? And what about hip hop—is sampling theft, or does it have artistic merit? These and other questions will guide us as we focus our attention on musical and lyrical details that raise issues of influence and allusion between songs from all over the popular music repertory. We will listen to artists such as Ray Charles, Eaki, The Beatles, Aretha Franklin, Jem Hendrix, Carrie King, Led Zeppelin, X, Madonna, Metallica, Beastie Boys, Jay-Z, and Daft Punk. We will also watch musically intertextual films such as 'The Rocky Horror Picture Show' and 'Ray.'

**Argument Mapping**

Andrew Egan (Philosophy)

It is frequently useful to be able to make a compelling, well-constructed argument for something. (For the thesis of your term paper, on behalf of your favored candidate in the election, or for what you take to be the best decision about which movie to go to, or where to have dinner...) It is also frequently useful to be able to effectively process, understand, and critique other people’s arguments, in order to decide whether to accept them and/or how to effectively rebut them. In this seminar, we will look carefully at arguments and how they work, and learn a technique for representing the structure of arguments in an especially clear and perspicuous way. We will practice this technique on a number of important philosophical arguments about (for example) morality, the existence of God, and the relation between minds and brains.

**Yoga: Finding Calm in Chaos**

John Evans (Dance)

This seminar will help you focus on finding calm in your life while joining the ranks of busy college students. Through the study and practice of yoga, we will explore how to build a stronger mind-body connection. This course will assist you in learning how the practice of yoga can support a happy and healthy life. Through centering and breathing techniques, strengthening and stretching yoga postures, and simple meditations, students will begin to gain a better sense of well-being. We will investigate mindfulness trainings and yoga sequences throughout the ten-week seminar.

**Alexander the Great: History and Legend**

Thomas Figueira (Classics)

Few figures have had so great an impact as Alexander, the son of Philip II of Macedonia and ‘leader’ of the Hellenic League, an alliance of the city-states of homeland Greece. Against expectation, Alexander succeeded to his father’s preeminence after Philip’s assassination and launched a campaign against the Persian Empire. Exceeding his father’s goal of liberating the Asian Greeks and conquering Asia Minor, Alexander seized Egypt, the Near East, much of central Asia, and the Indus valley. His career transformed the Balkans, eastern Mediterranean, and Near East.

**American Roots Music**

Angus Kress Gillespie (American Studies)

American roots music encompasses blues, country and western, gospel, Cajun, and Tejano genres. This kind of music originated in and was nurtured by small communities and spread across the nation. Eventually, in a new era of radio and recordings, these home-grown music traditions contributed to an explosion of American popular music. In this seminar, student participants will follow the remarkable story of this creative outpouring. Readings and discussions will focus on the pioneering geniuses who wrote the music and sang the songs.

**Russian Music Since 1989**

Michael A. Katrakhos (Music)

From the fall of the Berlin Wall in 1989 to the rise of the Internet and social media, Russian music has experienced a period of extraordinary innovation and diversity. This seminar will explore this musical landscape through an examination of key figures, trends and genres, and will consider the ways in which Russian music has been impacted by global cultural exchange.

**Somatic Studies: Practicing Mindfulness in Our Daily and Creative Lives**

Ani Javian (Dance)

As yoga, meditation, and other somatic techniques become popularized, the word “mindful” gets tossed around in our culture without truly considering its significance. What does it mean? This seminar works toward understanding and experiencing mindfulness via an introduction to general somatic principles such as self-reflection, sensory awareness, and body/mind integration. Through guided movement explorations and other opportunities for increased self-awareness, we may become more adept at tuning in to our interior selves, to the world around us, and to the earth that supports us. There will be some movement, some drawing, and some discussion as we practice listening to cultivate a holistic body/mind approach to our daily lives. No prior movement experience is necessary.

**The Problem of Evil in Philosophy and Popular Culture**

T. Corey Brennan (Classics)

The problem of evil, as Susan Neiman has described it, is the perennially difficult to satisfy “need to find order within those appearances so unbearable that they threaten reason’s ability to go on,” as when “at times incomprehensibly” bad things happen to “at least relatively” good people, and “at least relatively” good things to “at times incomprehensibly” bad people. Central to her watershed perspective on the problem are two related propositions. She proposes, on the one hand, that midway through the Enlightenment, the problem of evil developed, in addition to the traditional theological version—according to which human reason suffers, in the above “find order” spirit, to reconcile conscious human suffering with faith in divine wisdom, power, and beneficence, which either makes or allows it to happen—a more secular version as well. Here, while it’s no longer in response to suffering’s ostensibly divine origin, reason suffers similarly nonetheless, so much so as to call into question, as the theological version does already, reason’s very ability to make the order it so fervently desires. She goes on to propose, on the other hand, that in response to both versions of the problem primarily two competing perspectives arise, which competition defines us all today, beginning with the public rivalry between Rousseau’s and Voltaire’s, the former insisting that “morality demands that we make evil intelligible,” the latter that “morality demands that we don’t.” The seminar is designed to have participants work together to identify and elaborate the various ways in which these competing perspectives endure in philosophy and popular culture.
Looking East: A Different Way of Learning Dance, Language, Traditional Arts and Cultures through Movement

Paul Ocampo (Dance)
Chien-Ying Wang (Dance)

This course will investigate various dances, traditional arts and culture of Taiwan, the Philippines, and neighboring countries. Through the language of dance, students will learn traditional arts and cultures using practices and modality that are fun, interactive and informative. This seminar is designed for students who want to expand their understanding of dance as an emblem of cultural identity and an expression of social order. Along with the practice of dance, we will experience how to prepare traditional foods associated with respective festivities. The food serves as a conduit for with the practice of dance, we will experience how to prepare traditional arts and cultures using practices and modality that are fun, interactive and informative. This seminar is designed for students who want to expand their understanding of dance as an emblem of cultural identity and an expression of social order. Along with the practice of dance, we will experience how to prepare traditional foods associated with respective festivities. The food serves as a conduit for

Painting the Town: Urban Public Art from the Local to the Global

Marcy Schwartz (Spanish and Portuguese)

We interact with cities when we attend a rally, watch a parade, notice graffiti or look at murals in the subway stations. The city is a scenario for cultural expression, social organizing and public participation. This seminar will explore alternative visual culture, outside of museums and conventional arts institutions, in New Brunswick, in neighboring cities such as New York and Philadelphia, and internationally. The seminar activities will expose students to dynamic arts initiatives such as Philadelphia’s 10,000 public murals painted by community groups, murals in the New York City subway system, sculpture and other expressive culture in public spaces. These projects rely on the public to join in their design and implementation. We will take advantage of our own local urban surroundings to experience public arts initiatives around New Brunswick.

How to Learn a Chinese Dialect

Richard V. Simmons (Asian Languages and Cultures)

Learn Cantonese, Taiwanese, Shanghai, and maybe even others! This seminar will introduce the fundamentals of a single Chinese dialect over the 10 week course. The specific language we will study will be chosen by a poll of the registered students before the class starts. By the end of the course students will be able to carry out simple, basic conversational tasks in the language, write the dialect in Romanization, and be equipped with the skills to continue to learn the dialect on their own. Successful completion of the course requires regular attendance and participation, as well as composing and presenting a short conversational skit at the end of the course. This course has no prerequisites. Knowledge of Standard Chinese (aka Mandarin) is not required. Native and heritage speakers of Chinese dialects are welcome to take the course and to serve as informants or tutors.

Korean Hip-Hop: A New Poetic Intervention

Young-mee Yu Choe (Asian Languages and Cultures)

We will explore how Korean musicians have been able to build a creative space to experiment with this new American import since 1990s and to find ways to subvert censorship and finally to give birth to Korean Hip-Hop. After two decades of negotiating linguistic and cultural tensions, successful rappers have seamlessly created internal and multi-word rhymes, flow and storytelling that flaunt an identity of “self-conscious” artists in the world of musical self-outs.

Global Islamophobia in an Era of Populism

Sahar Aziz (Rutgers Law School; Director, Center for Security, Race, and Rights)

Western nations are experiencing a wave of populism eroding the liberal values these nations boast as setting them apart from illiberal regimes in the Global South and East. Animated by a sense of victimhood, an increasing number of citizens from majority groups are attached to populist rhetoric by right wing ideologues who condemn immigrants, Muslims, and social minorities as threats to liberal democracy. The stronger the populists become, however, the more the very system they purport to protect is destabilized. As xenophobia and Islamophobia is normalised in mainstream U.S. media and among right wing politicians, the chorus of populism demands building walls, banning Muslims, ending affirmative action, and restricting religious freedom. In this seminar, students will learn to think critically about the social, economic, political, and legal factors that contribute toward prejudice and discrimination against Muslims and Arabs in the United States and Europe in an era of rising populism.

"Inner Engineering" for Wellbeing and Thriving in College, Work, and Life

Tracy Chang (School of Management and Labor Relations)

"Inner Engineer" is a comprehensive science-based yoga and meditation program designed by Sadhguru (2016). The program equips one with effective tools to build competence on self-mastery of mind, body, emotion, and energy. With this self-transformation, one will be energetic, joyful, mindful, healthy, and fully functioning and realize his/her highest potential in college, work and life. Students will learn the Inner Engineering tools and learn about the research project that examines the effect of the tools on employee wellbeing and engagement in the workplace. Students will read the book "Inner Engineering" and keep a reflective journal weekly and engaged in didactic inquiry in class.

Truth or Fiction?

Lesdin Charles ( Rutgers Libraries)

The information age has democratized the dissemination of and access to information. Social media provides a voice to all and can blur the lines of fact and fiction. Are all tweets worth the noise they generate? How can we filter through opinions and the news media to gain accurate knowledge? This course will explore the impact of the information age on our understanding of truth. Through lectures, guest speakers, videos, role play, and discussion, students will examine various channels of information and will be required to find accurate data using a wide range of information sources.

Talking Politics: Disagreeing Without Being Disagreeable

Randi Chmielewski ( Eagleton Institute of Politics)
Elizabeth Matteo (Eagleton Institute of Politics)

In order for democracy to work, citizens need to be able to talk to each other. Addressing public policy challenges, such as stable economic growth, health care, and college affordability, requires reasoned deliberation, critical thinking, and open and civil discourse. Unfortunately, such models of political discussion can be few and far between in contemporary American politics. This seminar considers why engaging in honest but civil political discussion is integral to American democracy’s success, and explores productive ways to go about it. Topics that we’ll consider include: What are the effects of adversarial political interactions on the political process? What steps can be taken to ensure that political discussions are productive? How can we have respectful and honest conversations about public problems and their proposed solutions when we disagree? Students will be exposed to a range of examples of political deliberation (some contemporary and some historical), will witness models of political discussion regarding current policy issues, and will be offered opportunities to build their own skills in political discussion.

Hunger and Food Insecurity in New Brunswick: A Service Learning Perspective

Cara Cuite (Human Ecology)

This course will introduce students to the problem of hunger and food insecurity in New Brunswick, how it is measured, and programs designed to address it. Students will have the opportunity to visit and work at two food pantries and one soup kitchen, all located in downtown New Brunswick. Five additional hours of service in a food-related environment will be required. The importance of civic engagement and additional opportunities for service learning will be discussed throughout the semester. Students will write a reflection of what they have learned over the semester. Students must be 18 years of age when the course begins.

*Open to Honors College students only

First-Year: SOCIAL SCIENCES
Golf As an Aid to Your Career: Networking on the Links

Richard L. Edwards (Chancellor Emeritus and University Professor)
Lisa Jensen (PGA Professional/Rutgers Golf Course Manager)
Kate Sweeney (Senior Vice President and Financial Advisor, Morgan Stanley)

This seminar considers how understanding and being able to play golf can enhance your career development through fostering important "networking" opportunities. We will consider the history of the game of golf and how it can play a role in your personal and career life, both as a recreational activity, as a way to deal with stress, and as an important asset to your career, whether you work in the corporate or nonprofit sector. We will explore how for-profit corporations use golf for marketing and public relations purposes and how nonprofit organizations use golf for fundraising purposes. The seminar will include discussions with corporate executives, as well as two complimentary group golf lessons for the class. Whether you already play golf or you have never swung a golf club, you are welcome to participate in this seminar. Both men and women will benefit from this seminar.

Democracy and the Carceral State

Brittany Friedman (Sociology)
Kenneth Leon (Latino & Caribbean Studies; Criminal Justice)

At a time when fundamental questions about democracy, citizenship, representation, and justice are being raised, the direct connections between criminal justice reforms and democratic systems are seldom emphasized. Empirical evidence continues to highlight the glaring contradiction of a country that projects a message of freedom and democracy while simultaneously being home to the most expansive system of incarceration in the world. How can the criminal justice system be leveraged to advance instrumental political ends; 5. Reflect on the role of the college student experience upon the project of mass imprisonment; 2. Analyze the relationship of criminal law and the institutions of criminal justice have and continue to situate the concept of citizenship in U.S. policy and practice; 4. Understand and upon the project of mass imprisonment; 2. Analyze the relationship of criminal law and the institutions of criminal justice have and continue to situate the concept of citizenship in U.S. policy and practice; 4. Understand the ways in which systems of state governance, vis-à-vis, students who successfully complete this Byrne Seminar will be able to: 1. Understand the ways in which systems of state governance, commercial enterprises, and nonprofit organizations are built around and upon the project of mass imprisonment; 2. Analyze the relationship between Western legal and political theory and the systematic exclusion and under-representation of various groups in U.S. society; 3. Historically situate the concept of citizenship in U.S. policy and practice; 4. Understand how criminal law and the institutions of criminal justice have and continue to contribute to be leveraged to advance instrumental political ends; 5. Successfully engage in civil debate concerning the avenues for advancing an emancipatory, inclusive society; 6. Reflect on the role of the college student experience and institutions of higher education in addressing fundamental questions of law, order, governance, and power.

Resilience, Research, and Relationships

Caroline Glauss-Ehlers (Education Psychology)

No matter who you are or where you come from, your life is bound to be crowded with challenges. How do individuals successfully overcome challenges? This is the central question of resilience research; research on how people “bounce back,” adjust to change, and overcome adversity. This research shows that having just one important personal relationship is the most important factor that promotes individual resilience. In this seminar, we will explore resilience and relationships in the lives of students. After briefly reviewing the history of resilience research, including the professor’s own investigations in this area, our class discussions will connect resilience research with many types of relationships: mentors and peers in college, family relationships, relationships at work, and romantic relationships. We will also touch on resilience and gender identity.

Sound Mind, Sound Body: The Last 50 Years of Intercollegiate Athletics

Carl Kirschner (Spanish and Portuguese)

The world of intercollegiate athletics has changed dramatically from the days of regional competitions without media coverage to the present national stage with constant television and internet coverage. What are those principal changes? What role do universities play? Has the National Collegiate Athletic Association (NCAA) played; has television played? In 2020, what changes face college athletics? Is the current system sustainable? The seminar will review the history of intercollegiate athletics with special emphases on the effects of civil rights and title IX legislation, on the challenges resulting from the influx of TV money, and on the last ten years and on Rutgers in particular. There will be guests, including some of the more successful student athletes, current and past. Significant case studies involving other universities will be reviewed. In addition to the assigned readings, students will make presentations on topics related to the subject.

Pasts and Presents: Recollection, Archives, and Curation of Time

Triveni Kuchi (Rutgers Libraries)
Anjali Nerlekar (AMF/GAL)

How is memory created and archived? In what ways can memory be accessed? Are there personal and public memories? Can memories be fabricated and distorted? In this seminar we will examine these questions from literary, information, and archival studies perspectives. Through class discussions, guest lectures, films, and field trips we will learn more about what and how we create, keep, find, remember, and forget information about our past and present. For final presentations students will explore false memories, digitized memories, personal and public memories, and the impact of memory and its relation to imagination and the society.

Play to Learn in Higher Education

Megan Lotis (Rutgers Libraries)

Play can create a dynamic narrative that promotes engagement and community, as well as fosters creativity and problem solving which are crucial to innovation. Play also builds strong communication and social skills, and these skills can be helpful when creating knowledge, performing scholarly research, or engaging with one’s peers. Play can mean anything and be all-inclusive, encourages exploration, cross-disciplinary collaboration, and the chance to embrace failure as a positive part of learning. Play is an experience that is often lacking in higher education and yet a skill that many students are familiar with. This course will look closer at play, why it is an important part of our everyday lives, as well as its presence in higher education.

The Ecosystem of Entrepreneurship and Innovation at Rutgers

Gary Minkoff (Management and Global Business)
Jeffery Robinson (Management and Global Business)

In this seminar, student participants will be introduced to the entrepreneurs, inventors, supporters, and investors that make new businesses and new ventures happen in New Jersey. We call this the local ecosystem of entrepreneurship and innovation. Rutgers is a central player in this process of new venture creation. We will learn about entrepreneurship from alumni, faculty, and guest speakers from around New Jersey. Participants will be able to develop and pitch their own ideas to a panel of entrepreneurial students and alumni.

Fundraising for International Causes: Effectively Utilizing Crowdsourcing and Other Social Media for Global Causes

Ronald Quincy (School of Social Work)

In this seminar, we will examine the challenges that nonprofit organizations encounter to amass the assets and resources needed to manage their charitable and public services. Traditional and nontraditional fundraising methods will be discussed, along with marketing principles. You will learn the art and science of "selling" for money, inside tips on successful grantsmanship; and how to write winning funding proposals. The seminar will focus on "how to land the big fish": Readings and discussions will be drawn from newsletters, journals, writings of top fundraisers, and "best practices" scholarship in this field of study. Following the course, students will be able to write grant proposals, and enhance their techniques on how to "sell" for funding.
Only in New Jersey! New Jersey's History in Newspapers
Caryn Radick (Rutgers Libraries)

Politics. Wars. Crimes. Scandals. Shark Attacks. Celebrations. New Jersey had it all. Before the advent of radio, television, and the Internet, newspapers were vital for the sharing and dissemination of information. New Jersey had hundreds of local newspapers, each providing a unique snapshot of a community. These resources are still widely used by historians and genealogists and provide important insight into the daily life of another time.

In 2016, New Jersey joined the National Endowment for the Humanities' National Digital Newspaper Program, an effort to digitize historical New Jersey newspapers from microfilm. These newspapers are now available online at the Library of Congress's Chronicling America website (https://chroniclingamerica.loc.gov/) and more are being added. This seminar will look at the history of New Jersey newspapers and efforts of the newspaper project and consider how New Jersey newspapers shared news with their communities in the mid-to-late 19th and early 20th centuries, including news stories, society news, advertisements, and illustrations and photographs. Each student will learn about how life in New Jersey unfolded in its newspaper and will compare how stories were told and shared then and now.

HERstory of LGBTQI Through Film
Mark Schuster (American Studies; Dean for Graduate Student Life)

The course interrogates the portrayal of sexually diverse communities and identities through films as a critical lens of personal and political power. The class will discuss cultural perceptions that historically forced LGBTQI persons to hide their authentic identities. Mainstream films such as “Same Like It Hot,” “The Color Purple,” “Brokeback Mountain,” “Judgmental,” “Transamerica,” “Bird Cage,” “The Wedding Banquet,” “Dallas Buyers Club,” and “Moonlight” will be explored as well as independent films. Until recently, bisexuality has been virtually ignored in film criticism because it invokes both homophobia and transphobia. The ubiquity of information technology in the West makes it easy to overlook the persistence of vast areas of information poverty in the world. This global digital divide of access to technology and information literacy continues to threaten human rights, development goals, and political stability. Information also has a private and personal value. We will examine case studies of how governments and corporations quantify information and what this means about our own information “worth.” In addition to class discussions, we will develop information literacy skills and use scholarly resources available through the Rutgers University Library to explore these topics.

Experiencing National Parks and Parklands: How Parks Are Shaped to Communicate With Us and About Us

David Tulloch (Landscape Architecture)

From Yellowstone to Yosemite, National Parks and Parklands are designed to send all sorts of messages to their visitors. This class will explore ways that National Parks (focusing primarily on those in the US) communicate messages to visitors. Designers have also employed precisely aligned roads and buildings rich in symbolism to communicate with visitors at an experiential level. Published materials, such as the impressively consistent NPS brochures used at every park, and carefully designed signs provide an overt system of communication. The class will visit a NPS site to look for messages and learn more about this amazing network of natural treasures.

Information Inequality

Lily Todorinova (Rutgers Libraries)

In this course, we will develop an understanding of information as a commodity, with a richly contested value for both individuals and societies. This course will engage with different types of information inequalities, such as those between economically rich/poor societies, as well as situations where information is restricted or censored. From the level of societies, information is politically and economically charged. The ubiquity of information technology in the West makes it easy to overlook the persistence of vast areas of information poverty in the world. This global digital divide of access to technology and information literacy continues to threaten human rights, development goals, and political stability. Information also has a private and personal value. We will examine case studies of how governments and corporations quantify information and what this means about our own information “worth.” In addition to class discussions, we will develop information literacy skills and use scholarly resources available through the Rutgers University Library to explore these topics.

A Happy Child Makes a Healthy Adult
Ioannis Androulakis (Biomedical Engineering)

Traumatic psychosocial events in early life, aka Adverse Childhood Experiences (ACEs: neglect, maltreatment, caregiver stress/depression, domestic/community violence) have been associated in epidemiological studies with increased lifetime risk of adverse health outcomes, including chronic non-communicable diseases such as diabetes, heart diseases and cancer, as well as psychiatric disorders. ACEs can have devastating, long-lasting effects on children’s health and well-being. In New Jersey, 41 percent of children 0 – 17 years have experienced some form of adversity during their early formative years. Nationwide, more that 46 percent of the 34 million children under the age of 18 are experiencing some form of adversity.

This Byrne seminar will explore how to engage scientists, clinicians, policymakers, practitioners and communities to work together advancing our fundamental understanding of the links between ACE and late-life health impacts and develop evidence-based approaches to mitigate the impact of ACEs and helping every child have a healthy start in life.

The Secret Life of Art: A Forensic Exploration of Art and Cultural Objects

Johanna Bernstein (Assistant Dean for International Programs; Chemistry and Chemical Biology)

What is that sculpture made of? How does an artist choose which materials to use? How long will these materials last? How can you tell if something is a fake? We will answer these questions by looking at art and cultural objects from the point of view of an artist or craftsman, a scientist, an art conservator, and a historian. Using a series of case studies from museums and cultural institutions around the world, this seminar will show how technological advances have influenced the creation of art and our ability to examine them. Topics will include forensic analysis and the degradation of materials, technical art history, and analytical sciences applied to the preservation and conservation of historic objects.

Batteries, Genes, and Beyond

Alex Bertuccio (Chemical and Biochemical Engineering)

Have you ever wondered how beer is made? Maybe how a battery works? Or for that matter, how anything in your life is made? This seminar will take a look at some of the “behind the scenes” engineering that makes products you use in your everyday life ranging from plastics to batteries to beer. We’ll also delve into how some of these items affect the world. Other topics discussed are: gene editing/ gene silencing, the engineering behind an automobile, and how clean is your water?
This is Your Brain Changing
Kasia Bieszczad (Psychology)
This seminar will highlight the many ways that the brain changes itself. Things you do, as you grow, age, learn, ingest, and process, induces "neuroplasticity." Students will be exposed to concepts of changes in the brain due to experience and learning, but also with respect to exercise, disease, addiction, and aging over a lifetime. Furthermore, we will discuss the many biological levels in which the brain changes under these conditions, even all the way down to genes and the epigenome. We will also highlight how neuroscience techniques and tools were key to discoveries of neuroplasticity in synapses, circuits, systems, and molecules.

Big Data and Data Science
Javier Cabrera (Statistics), Ryan Womack (Rutgers Libraries)
The world is undergoing a data revolution as big data—data collection and analysis at massive scale and increasing speed—is transforming academic research and business alike. The newly evolving discipline of data science is a fusion of statistics, computer science, and methods forged and refined by big data. This seminar explores the changes big data is bringing, from personalized genomic data, smart devices, real-time data streaming, to AI-driven decision-making. We also examine the unique challenges in statistical methodology and 400% growth in data science in each of these areas, and student presentations will allow each student to explore a topic of interest in more detail. On local field trips, students can see large-scale data in practice and meet data experts in academia and business.

Food Waste in Institutional Settings
Sara Elnakib (Family & Community Health Sciences Educator/SEBS)
According to the Food and Agricultural Organization of the United Nations (FAO), approximately one-third of all food produced globally for human consumption is lost or wasted, equivalent to approximately 1.3 billion tons of food per year. In the United States, about 40% of the food grown is thrown out, with food being lost and wasted at every step of the food supply chain. However, most of the food waste occurs on the consumer level. This course will follow food waste in different institutional settings including, school cafeterias, college dining halls, hospital patient rooms, and supermarket surplus. Join us as we measure food waste in New Brunswick Public Schools as well as glean food from local supermarkets to share with food pantries.

Health Career Cruising
Barbara Gladson (School of Health Professions), Nancy Kirsch (School of Health Professions)
Thinking of a career in healthcare? Then this is the Byrne Seminar for you. Follow a patient’s journey to health while learning about a variety of health professions. Experience what it is like to help someone learn to walk again, to detect diseases from a small speck of blood, and to look into the heart as it delivers oxygen to our vital organs. Join us for a ten-week tour around the body while learning about the exciting professions that restore wellness and health. Course Description: This course is designed to introduce the student to a wide spectrum of healthcare careers including Physical Therapy, Physician Assistant, Clinical Laboratory Services, Nutritional Sciences, Health Informatics, Psychiatric Counseling, Diagnostic Imaging, and Clinical Research. Utilizing a case-based approach, students will follow a patient through their journey of recovery while gaining introductory knowledge about the health profession and the patients that they serve. Additionally, students will be able to explore evaluation tools and treatment modalities and participate in simulated clinical experiences.

Chemical and Biological Weapons
Donald Gerecke (Pharmacology and Toxicology)
In this seminar we will examine potential weapons of biowarfare—including biological, chemical, and nuclear weapons—from several perspectives. Topics include their mechanism of action, biological impact, detection and recognition, epidemiology, and treatment. Using risk assessment and critical thinking, we will evaluate the potential dangers and effectiveness of using these types of weapons. We will also investigate strategies for defense against attacks, and the bioethical challenges of biotechnology research.

Spinal Cord Injury and Stem Cells: Pushing the Frontiers, Raising the Ethical Questions
Martin Grumet, Patricia Morton, and Wise Young (Cell Biology and Neuroscience)
Using present day examples from stem cell and spinal cord injury research and clinical trials, this course will enable students to look beyond the headlines to the underlying facts and issues in scientific research, to critically raise and examine ethical questions, and to understand that the purpose of science is to improve the lives of people. Students are encouraged to find and report on examples in movies, television, newspapers, magazines, journals, and other contemporary sources. The class includes tours of the W. M. Keck Center and Stem Cell Research Laboratories. In addition, one session will feature a guest and family dealing with spinal cord injury who will share their experiences and answer questions.

Is there life on Mars?
Max Haggblom (Biochemistry and Microbiology), Lee Kerkhof (Marine and Coastal Sciences)
This seminar will examine the prospects of life on Mars, and elsewhere in the Universe. Not "little green men", but microorganisms. We will explore how life is thought to have evolved on Earth and, with a focus on microbial life, identify the limitations and constraints to life as we know it. We will discuss how the NASA Exobiology program aims to understand the phylogeny and physiology of microorganisms whose characteristics reflect the nature of primitive environments or exoplanets. By examining the requirements and limitations to life on Earth and elucidating diverse microbial metabolisms and adaptations to extreme environments we can understand the potential of life to adapt to conditions on other planets or icy moons.
Energy Flow in Nature
Yogesh Jahluria (Mechanical Engineering)

Natural phenomena, from lakes, rivers and animals to climate and environmental flows, are largely governed by the flow of energy. Most of the energy comes from the Sun and we lose energy to the ambient medium. The seminar discusses how this flow of energy is critical to our survival and how it affects the Earth, the environment, the climate and what we experience in nature. The basic aspects as well as the observed phenomena are discussed. Among the topics considered are solar flux, global climate change, maintaining internal body temperatures, temperature and pressure decrease with height, thermal plumes due to heat input by fires and cities, and effect of temperature rise on melting of polar caps, sea levels, and storms. Use of solar, wind and geothermal systems for energy supply, initiation, growth and spread of forest fires, thermal plumes due to heat input by fires and cities, and effect of temperature rise on melting of polar caps, sea levels, and storms. Use of solar, wind and geothermal systems for energy supply, initiation, growth and spread of forest fires, thermal plumes due to heat input by fires and cities, and effect of temperature rise on melting of polar caps, sea levels, and storms. Use of solar, wind and geothermal systems for energy supply, initiation, growth and spread of forest fires, thermal plumes due to heat input by fires and cities, and effect of temperature rise on melting of polar caps, sea levels, and storms.

Complementarism: A Biology-Derived Philosophical Framework Integrating Physics, Biology, Philosophy, and Spirituality
Sungchul Yi (Pharmacology and Toxicology)

Complementarism is a new philosophical framework constructed on the basis of the premise that the principle of complementarity formulated by N. Bohr (1885 – 1962) in quantum physics is a universal principle applicable beyond physics to biology, philosophy, and spirituality. In this seminar, we will explore the version of complementarism that the instructor began to develop in the 1970s motivated by the realizations: (i) that information (A) and energy (B) are essential for explaining life (C), just as the wave (A) and particle properties (B) are essential for explaining light (C), and (ii) that a similar tridiac relation is found in numerous philosophical systems in the East and the West, including the philosophy of Lao-Tse (604 BC – ?), Aristotle’s (384 BC – 322 BC) hylomorphism, Spinoza’s (1632 – 1677) doctrine of substance, the French ontology of Maurice Merleau-Ponty (1908 – 1961), and the sign theory (i.e., semiotics) of Charles S. Peirce (1839 – 1914). We will also examine the possibility that complementarism may be a member of a larger category of philosophical systems recently named “tradic monism” that includes the irreducible tridiac theory of signs advocated by Peirce.

Flying Faster Than the Speed of Sound
Doyle Knight (Mechanical and Aerospace Engineering)

On October 14, 1947, the sound barrier was broken for the first time in a manned level flight in the Bell X-1 piloted by Chuck Yeager. This remarkable achievement, due to the efforts of many engineers and scientists, marked the beginning of the age of supersonic aircraft. The seminar will examine the contributions of many of this era’s pioneers, including John Andre, Busemann, Prandtl, Tupolev and many others. The crucial role of the development of jet and turbofan propulsion systems will be reviewed. Both U.S., European, and Soviet Union (now Russian Federation) aircraft will be considered.

The Surveillance Society and its Discontents
Casimir Kulikowski (Computer Science)

Charles McGrew (Laboratory for Computer Science Research)

People have been spying on each other from the beginning of time. History tells many tales of “official” government-employed spies as well as more homogenous stalkers. It is not surprising that the ability to conduct spying or “surveillance” has ramped up significantly now that all our personal information has become very nearly transparently available to anyone on the “net”—and to many a dicker hacker even if we have taken steps to encrypt and hide what we wish to hide. The disregard of computer security until very recently, and even today, has allowed practices of cyber-surveillance to proliferate and become ubiquitous. A central concern is that the experiences of both business and government control have led to an unregulated “cloud”-based economy where individual information becomes public, and where personal privacy has effectively disappeared—for our most vulnerable medical and financial data—and our social or political opinions of the day can come back to bite us when the “social climate” changes, and intelligent people take control, not to mention the opportunities for simple blackmail. “Big brother” watching us has happened before, and can happen again, with cyber-surveillance amplifying the ambiguities inherent in observed human behaviors now that they are “eternally” inscribed in the cloud. This class will seek to identify dangers to privacy, what it means to you, and how we might better defend ourselves in the future from those who seek to steal our information (and in some sense, ourselves.)

RIU3D! 3D Printing and the Future of How We Make Things
Howon Lee (Mechanical and Aerospace Engineering)

Three-dimensional (3D) printing is a manufacturing technique in which a 3D physical object is created by directly joining constituent materials. 3D printing has received significant attention in recent years due to its potential impact in industry, defense, healthcare, and even for hobbies. This seminar series will introduce the principles of various 3D printing technologies, their capabilities and limitations, and emerging applications of 3D printing. In addition, recent implementations of 3D printing will be introduced including 3D printing and bio-printing. Students will have opportunities to use 3D printers to print their own 3D designs.

Kitchen Chemistry and Food Physics
Richard Ludescher (Food Science)

Food is complex. We take fruits and vegetables and grains and the flesh of animals and mix them together, often in precise and complicated ways that build detailed structures on length scales from nanometers to centimeters, usually heat them up for a while, and then either eat them at once or package and store them for days to months. Ever wonder what is going on and what makes specific things happen? Find out through readings, tours, activities, and projects that illustrate how much chemistry, biology and psychology is involved in understanding how foods have the properties we love.

Exploring the Deep Sea
Richard Lutz (Marine and Coastal Sciences)
Costantino Vetriani (Biochemistry and Microbiology)

The seminar will focus on deep-sea exploration from the origins to present times, and discussions will be based on a mix of oral presentations and documentaries. The seminar will expose students to the deep-sea environment and its inhabitants, and it will include discussions on ongoing ecological and microbiological research conducted at Rutgers in the most extreme environments on the face of the planet (e.g., deep-sea hydrothermal vents with temperatures in excess of 700°F located at depths of 1 – 2 miles beneath the ocean surface). The biotechnological potential of the deep-sea—i.e., the discovery of chemical compounds isolated from deep-sea vent organisms that may have pharmaceutical potential for curing certain types of cancer—will also be discussed. “Hands on” activities will include interactive exchanges between students and the professors focused on historical videos of deep-sea exploration. Among others, these videos include an Oscar-winning film documenting the initial biological expedition to deep-sea vents in 1979 (led by the first Director of Rutgers Institute of Marine and Coastal Sciences) and a special, large-screen Blu-ray showing for the class of an IMAX film entitled “Volcanoes of the Deep Sea” that was co-produced by Rutgers University featuring Rutgers scientists and research efforts. Rutgers was recently ranked 4th in the world among oceanographic research institutions and this seminar will expose students to not only the cutting edge, deep-sea exploration that played a critical role over the years in helping Rutgers achieve that prominent world stature, but also to the many opportunities available to them related to oceanography at the University.
Paperbots and Art
Aaron Mazzeo (Mechanical and Aerospace Engineering)
Pulp-based paper has conveyed information with printed lettering, diagrams, and illustrations for hundreds of years. In these conventional formats, the flipping or turning of pages has required human manipulation. Recent research efforts are beginning to add life and active functionality to paper-based structures in the form of mechanical grippers, manipulators, and locomotors. In this hands-on seminar, students will review state-of-the-art research in paper-based robotics (i.e., paperbots) and active origami, and then exercise creativity to build paper-based machines that will be capable of motion and interaction with humans. By also planning the aesthetics of their projects, participants in this seminar will go beyond building gadgets to craft functional pieces of art.

Climate Change and Water Resources
Jim Miller (Marine and Coastal Sciences)
What are the global geopolitical and policy implications of climate change? This seminar will introduce students to global climate change that is occurring in response to increasing levels of atmospheric greenhouse gases. After an introduction to the science of climate change, we will focus on potential future changes in water resources, both globally and in New Jersey, including the potential for increased floods and droughts, sea-level rise and coastal salt-water intrusion, and changes in groundwater reservoirs. Hands-on assignments will include learning about the sources of water in students’ hometowns, how the water is obtained and processed, and what local companies are doing to address climate change. This seminar may include a boat trip on the Raritan River and/or a field trip to a local water processing plant.

Global Environmental Health
Mark Robson (Plant Biology)
There are almost eight billion people in the world today and the population will grow to close to ten billion by 2050. Almost eighty five percent of the population live in developing countries. One of the challenges for this ever-growing population is providing a secure food supply. We will discuss the trends in global food production and the technology used to increase global food supply. We will also explore the ever-growing obesity epidemic – while there are 300 million undernourished people in the world there is a larger number of people, close to 1.5 billion, who are overweight. Finally, we will look at the overall health of the global population, their jobs, their lifestyle, and the relationship to global environmental health issues, in particular those dealing with problems such as water and air pollution, food production and safety, and infectious and occupational diseases. Professor Robson will share experiences from developing countries in Southeast Asia and West Africa. Case studies and current research will be used as illustrations.

Origins of Life, Meaning and the Universe
Stephen Schnetzer (Physics and Astronomy)
This seminar will be on the nature of reality as described by modern physics and its relation to the concept of reality that we use in our everyday lives. The primary text will be The Big Picture: On the Origins of Life, Meaning and the Universe by Sean Carroll. We will also discuss writings by Lenny Susskind, Roger Penrose, Steven Weinberg, David Deutsch and others. The seminar will be wide ranging touching on: fundamental physics, cosmology, the origin and evolution of life, quantum information and consciousness. The focus will be on what we know and how we know it. The discussions will be serious but a math background is not required.

The Universe: What We Know and What We Don’t
Stephen Schnetzer (Physics and Astronomy)
This seminar explores what we have learned about the fundamental physics of elementary particles and cosmology over the past fifty years along with the current remaining unknowns. Through discussions, students will gain an idea of what fundamental physics research is and the pressing questions that we are currently striving to answer. The seminar is based on an article by Steven Weinberg from the New York Review of Books entitled “Physics: What We Do and Don’t Know.” The seminar will be at a serious level, but the use of mathematics will be kept to a minimum. Students who have taken college-prep level mathematics in high school should be well prepared.

Chaos and Pattern Formation in Physics, Chemistry, and Biology
Troy Shinbrot (Biomedical Engineering)
We will discuss several examples of chaos and pattern formation from physics, chemistry and biology. We will explore examples such as the dripping faucet—which we will show undergoes a transition to periodic; at low water flow, to period doubling to chaotic as the flow rate increases. We will discuss the history of the field starting with Poincaré’s revelation that planetary orbits in the solar system are not stable, leading through Lorentz’s discovery that models for the weather exhibit strange attractors, and culminating in modern studies that reveal chaos and pattern formation in the heart. The seminar will be example-oriented, using simple models using only elementary algebra.

Food for the 21st Century: Can We Feed 11 Billion People?
Paul Takhistov (Food Science)
Feeding the world’s growing population is not an easy task. It is estimated that there will be 11 billion people on the planet by 2100. Can we produce enough food for all people sustainably and can we afford it? With modern science and technologies the food industry has gained a whole new set of tools to improve certain properties of food and associated processes that are necessary for food production. However, food production should never come at the expense of human health. In this seminar we will discuss principles of the food supply chain, the modern approaches to design food products, and the ways to create a sustainable food future. We will also discuss applicability of new sustainable sources of food such as algae, insects and biologically derived polysaccharides as food supplements. During the course, students will have an opportunity to prepare some formulations using new food materials and technologies, such as edible films, 3D printing, and more.

Metabolism
Malcolm Watford (Nutritional Sciences)
How often have you heard the statement “I am fat because I have a slow metabolism”? In this course we will study all aspects of metabolism, and how it is studied, from the first studies of Lavoisier in 1776 when he placed a guinea pig, named Gina, in a calorimeter to the present day field of metabolomics. We will consider how metabolism changes in conditions such as obesity, diabetes and cancer and how understanding such changes may lead to innovative treatments. Each topic will begin with some historical details and then focus the potential of personalized medicine and nutrition to maintain a healthy metabolism. Topics together with practical demonstrations, will include: Brown Fat, the fat that makes you thin; Leptin, the cure for obesity (that wasn’t); The Warburg effect in Cancer cells; Treatment of diabetes by gene therapy to change metabolism. The answer to the opening question? A slow metabolism is not the reason you are fat, the evidence for which will be discussed in the class, when we consider differences in body composition.

Addiction
Mark West (Psychology)
Do people become addicted to technology? Although some students have direct or indirect experience with substance abuse, all will have experienced the lure of the iPhone, TV, web surfing, texting or playing video games. This seminar will encourage students to describe the behaviors they observe in themselves or others and to explore cognitive processes involved in self-starting, repeating or perseverating in technology related behaviors. The goal will be to discuss whether these behaviors are similar to or different from DSM V criteria for addictive behaviors such as substance use, binge eating disorder, or gambling. We will come to understand the scientific knowledge created by clinical and preclinical researchers on additions, including the neural underpinnings of behavioral and cognitive processes of the drug user. Ultimately, students will learn to identify warning signs in themselves or others when succumbing to self-defeating behaviors related to technology.
ABOUT BYRNE SEMINARS

The First-Year Seminars at Rutgers-New Brunswick were launched in fall 2007, and the program was re-named the Byrne First-Year Seminars in fall 2008 to honor a generous donation by Mr. and Mrs. John J. Byrne. Mr. "Jack" Byrne graduated from Rutgers College in 1954. Byrne Seminars were created to realize the Byrne family vision of introducing students to research faculty in a small seminar setting at the outset of their academic journey.

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