

# BYRNE SEMINARS

SPRING 2020

## WHAT ARE BYRNE SEMINARS?

Byrne Seminars are small, one-credit courses, limited to 20 students. Offered through the Office of Undergraduate Education, 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 through WebReg starting in November. This catalog also includes section and index numbers for each spring seminar below the course description. You may find the Online Schedule of Classes useful in determining which courses are open and will best fit 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](mailto:byrneseminars@rutgers.edu) / Call 848.932.6971  
Or visit our website: [WWW.BYRNE.RUTGERS.EDU](http://WWW.BYRNE.RUTGERS.EDU)

# SPRING 2020

Honors College Byrne Seminars .....	6
First-Year: Humanities.....	8
First-Year: Social Sciences .....	12
First-Year: Sciences .....	18

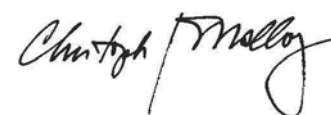
## FROM THE CHANCELLOR



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 "Paperbotics 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 PROVOST



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.

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 Provost, Undergraduate Education

## FROM THE FACULTY DIRECTOR



One of the things that I most enjoy here at Rutgers is teaching my Byrne Seminar on Global Health each semester. In fact, all the faculty I know who teach in this great program enjoy their interactions with our first-year students and the relationships that form and in many cases continue for the next four years. I have been teaching in the Byrne Seminar Program since it started in 2007.

Now I have the privilege of serving as the Faculty Director for the Byrne Seminars program. I feel very fortunate to have this responsibility and I welcome and encourage you to take advantage of this extraordinary opportunity.

The Byrne Seminars Program offers a wide range of titles and topics, the seminars give you a chance to learn as well as have some fun. I urge you to consider taking one of these courses. Go ahead and push your boundaries a little and take a class that is outside of your intended major or current interests. Who knows, this may become a new area of interest to you. With over one hundred seminars, there are plenty of choices. The faculty who teach in the Byrne Program are some of Rutgers' top professors, individuals who are recognized in their field for their innovation, leadership, and scholarship.

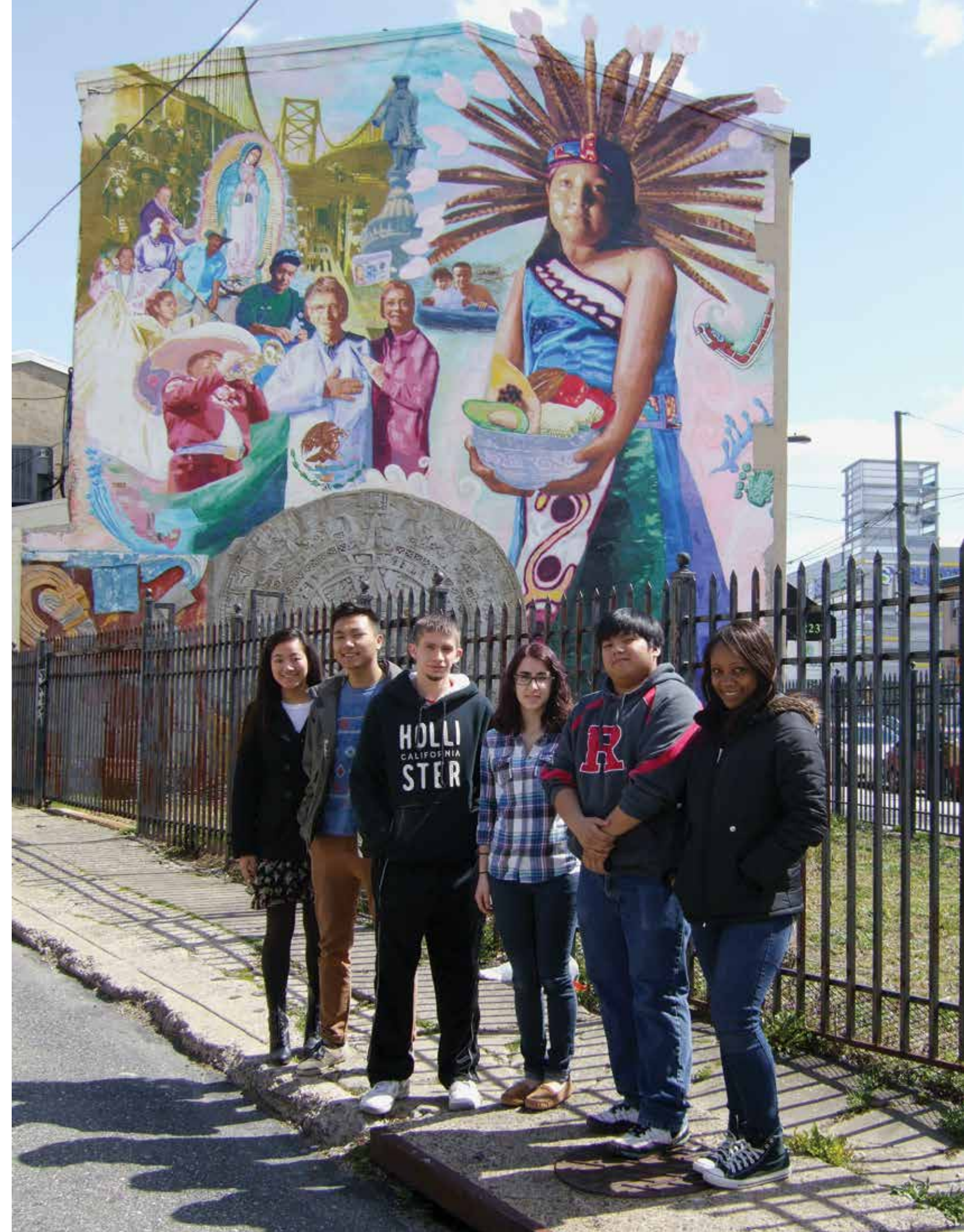
If you are on the fence about taking a Byrne Seminar, my advice is "jump off the fence" find one you like and join the thousands of students who have participated and profited from this great first-year experience at Rutgers.

Welcome to Rutgers and welcome to the Byrne Seminars Program.

Be well,



**Mark Gregory Robson, Ph.D. MPH DrPH**  
Rutgers Board of Governors Distinguished Service Professor  
Faculty Director of the Byrne Seminar Program





# HONORS COLLEGE Byrne Seminars

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.

## **Hunger and Food Insecurity in New Brunswick: Service Learning and Alternative Spring Break**

**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 food pantries and a soup kitchen, all located in downtown New Brunswick. The importance of civic engagement will be discussed throughout the semester. Enrolled students are required to participate in a week-long immersive service-learning experience during the Rutgers spring break (March 15–21, 2020). The immersive service learning will take place in New Brunswick and allow students to volunteer at community organizations, connect and apply their classroom learning to the service sector, and reflect upon their experiences with their peers. Students will write a reflection of what they have learned over the semester. Students must be 18 years of age when the course begins. *If students are unable to commit to participation in the immersive service learning over spring break, they should not enroll in this course.* There is no additional cost to participate in this course and break trip.

11:090:101 section 24 index 11249

## **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 42 index 04642

## **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 49 index 11154



## 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.

01:090:101 section 05 index 07893

## 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, Elvis, The Beatles, Aretha Franklin, Jimi Hendrix, Carole 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."

01:090:101 section 06 index 14173

## 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.

01:090:101 section 34 index 13915



## 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.

01:090:101 section AE index 11289

## 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.

1:090:101 section 29 index 31750

## 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.

01:090:101 section 24 index 06113

## 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.

01:090:101 section 16 index 31749



## The Problem of Evil in Philosophy and Popular Culture

**Trip McCrossin** (Philosophy)

The problem of evil, as Susan Neiman has described it, is the perniciously 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 strains, in the above “find order” spirit, to reconcile conspicuous 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 still 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 44 index 04643

## 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.

01:090:101 section 32 index 16388

## 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.

01:090:101 section 22 index 16446

## 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 3000 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.

01:090:101 section 21 index 06112

## How to Learn a Chinese Dialect

**Richard V. Simmons** (Asian Languages and Cultures)

Learn Cantonese, Taiwanese, Shanghaiese, 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 linguistic informants or tutors.

01:090:101 section 50 index 17353

## Korean Hip-Hop: A New Poetic Intervention

**Young-mee Yu Cho** (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 sell-outs.

01:090:101 section 65 index 13934

## Green Zone: Military Cultural Competency Training

**Bryan Adams** (Assistant Director, Rutgers Office of Veteran and Military Programs and Services)

**Ann Treadaway** (Director, Rutgers Office of Veteran and Military Programs and Services)

In interviews conducted with students who have served in the military at colleges and universities across the country, a common theme emerged. These students felt as if the campus community did not respect, understand, or appreciate their service which made them less likely to identify themselves. Military affiliated students expressed feeling as if they were judged unfairly because of their service and for some, the way in which the media portrays the military is to blame. This seminar will examine military culture and challenge these stereotypes in order to foster the creation of a more knowledgeable and welcoming campus community.

01:090:101 section 14 index 05449





## Global Islamophobia in an Era of Populism

**Sahar Aziz** (Rutgers Law School; Director, Center of 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 attracted to populist rhetoric by right wing ideologues who condemn immigrants, Muslims, and racial 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 normalized 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.

01:090:101 section 67 index 16389

## "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, 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.

01:090:101 section 17 index 31824

## Truth or Fiction?

**Leslin 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.

01:090:101 section 98 index 11165

## Talking Politics: Disagreeing Without Being Disagreeable

**Randi Chmielewski** (Eggleton Institute of Politics)

**Elizabeth Matto** (Eggleton 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.

01:090:101 section 02 index 13910

## Resilience, Research, and Relationships

**Caroline Clauss-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 28 index 11197





## 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.

01:090:101 section 07 index 07894

## Leaders are Made, Not Born

**Maurice J. Elias** (Psychology)

Throughout history, and certainly during the history of the United States, the direction of social progress has been synonymous with direction of leadership. The revolutionary understanding of leadership is that it is not an inborn quality—it is everywhere and in everyone’s capacity. It’s not something one waits for. This seminar 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, civic, corporate, and nonprofit career contexts and leadership perception, style, and myths, including those related to gender and race. The course includes readings and discussion, debate, role-play scenarios, and real-world visibility and exposure to leadership with distinguished guest speakers from academic and career leadership contexts.

01:090:101 section 08 index 13913

## Democracy and the Carceral State

**Kenneth Sebastian León**

(Latino and 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 and punitive control ever known to modern history. Through the use of substantive lectures, guest speakers, multimedia presentations, and site visits, students who successfully complete this Byrne Seminar will be able to: 1. Understand the ways in which systems of state governance, commercial enterprises, and non-profit 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. history; 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 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.

01:090:101 section 18 index 31825

## The Transformation of New Brunswick: Past, Present, and Future

**James W. Hughes** (Planning and Public Policy)

**David Listokin** (Planning and Public Policy)

This seminar will examine the historic rise, decline, and revitalization of New Brunswick from its colonial origins to the present in the context of the economic and demographic changes that were taking place in New Jersey and the nation. The roles of Rutgers and Johnson & Johnson in the decision-making and planning processes that led to the city’s resurgence will be detailed. The lessons (both positive and negative) for urban America will be examined, concluding with discussions of the future of the city as the third decade of the twenty-first century approaches.

01:090:101 section 30 index 28626



## 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 have universities played; has the National Collegiate Athletic Association (NCAA) played; has television played? In 2020, what challenges 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.

01:090:101 section 33 index 04637

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

**Triveni Kuchi** (Rutgers Libraries)

**Anjali Nerlekar** (AMESALL)

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.

01:090:101 section 19 index 31826

## Play to Learn in Higher Education

**Megan Lotts** (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.

01:090:101 section 26 index 09918

## 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 and 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 and participants will be able to develop and pitch their own ideas to a panel of entrepreneurial students and alumni.

01:090:101 section 25 index 31827

## 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 “asking” 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 “ask” for funding.

01:090:101 section 52 index 08060

## 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.

01:090:101 section 03 index 09917



## 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 herstorically forced LGBTQI persons to hide their authentic identities. Mainstream films such as: “Some Like it Hot,” “The Celluloid Closet,” “Brokeback Mountain,” “Bound,” “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 anxiety and confusion. More recent films such as “Boy Erased,” “Call Me By Your Name,” “Bohemian Rhapsody,” “The Favourite,” portrayals in “Crazy Rich Asians,” “Rafiki,” “A Kid Like Jake,” “Hurricane Bianca,” “Vita and Virginia,” and “Mapplethorpe,” are examples of an explosion of films in recent years that empower and reflect all members of our very complex and evolving American and global identity.

01:090:101 section 60 index 08676

## 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 82 index 14481

## 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.

11:090:101 section 05 index 3182

## 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. We will also talk about how to make use of our unique cultural background and our Rutgers experiences at Rutgers to better develop our future careers.

01:090:101 section 76 index 09053



## 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 than 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, policy-makers, 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.

01:090:101 section 01 index 11040

## Biology of Women

**Joan Bennett** (Plant Biology and Pathology; Associate Vice President for Promotion of Women in Science, Engineering, and Mathematics)

The language describing human anatomy and physiology was largely written by men. Perhaps for this reason, much of the medical jargon describing women's biology can be misleading or have negative connotations. This course will give a basic overview of women's biology and will cover male and female reproductive anatomy, the menstrual cycle and menopause, birth control, pregnancy, labor and delivery, childbirth anesthesia, lactation, sex determination, and diseases of the reproductive system. The class is meant to be a non-technical introduction to obstetrics and gynecology, with commentary of changes that have occurred in recent years. Demonstration materials will be used in each class session.

11:090:101 section 02 index 09925

## 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.

01:090:101 section 11 index 07895

## 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 series 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?

01:090:101 section 09 index 17348

## 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.

01:090:101 section 04 index 13911

## 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 analytics at massive scale and increasing speed -- is transforming academic research and business alike. The newly evolving discipline of data science has emerged from 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 computing that big data brings. We will discuss the new skill sets to analyze large-scale data being developed under the umbrella of data science, as well as careers in data science. Readings and class discussions will explore the implications of big data and 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.

01:090:101 section 15 index 04635

## Food Waste in Institutional Settings

**Sara Elnakib** (Family and 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.

11:090:101 section 03 index 16390



### 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 professions and the patients that they serve. Additionally, students will be able to explore evaluation tools and treatment modalities and participate in simulated clinical experiences.

01:090:101 section 37 index 31751

### 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 anti-bioterror research.

01:090:101 section 23 index 04636

### 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.

01:090:101 section 27 index 04963

### Hunger Frames

**Chris Gunning** (New Jersey Institute for Food, Nutrition, and Health; Rutgers Health Services)

**Peggy Policastro** (New Jersey Institute for Food, Nutrition, and Health; Dining Services)

Can the framing of a situation affect what you eat? What types of environments cue you to eat healthy foods, and what contextual cues lure you into overeating or indulging in junk food? This class explores recent research showing that re-designing the dining environment can promote healthier eating. We will meet each week at a different dining setting on campus (e.g., dining commons, take-out line, Harvest Cafe, Henry's Diner) to discuss recent studies and observe our dining environments. This seminar highlights new research on how principles from behavioral economics and social psychology can be harnessed to promote healthy eating behavior. Students must be on a meal plan and willing to use 7 meal swipes for this course.

01:090:101 section 10 index 04634

### 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.

11:090:101 section 04 index 16754

## Energy Flow in Nature

**Yogesh Jaluria** (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, thermals and 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. Ice melting and solidification in natural environment. Rejecting waste heat to the environment. Energy flow through natural materials like wood, rock and diamond. Effect of the atmosphere on overall energy transfer. Simple illustrative assignments will be employed to consider phenomena such as wind chill, how animals cope with extreme temperatures, ice melting, additional moisture in the air and modeling natural temperature cycle of lakes and ponds. There may be field trips to solar farms. Basically, the seminar focuses on the importance of energy transfer on natural phenomena, considering a variety of important circumstances and problems commonly encountered in our daily lives.

01:090:101 section 12 index 13914

## 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 68 index 13024

## 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 homegrown snitches. 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 clever 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 conveniences 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 intolerant 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.)

01:090:101 section 31 index 06114

## RU3D? 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 20 index 07004

## 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, physics, biology and psychology is involved in understanding how foods have the properties we love.

11:090:101 section 08 index 31830



## 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 - e.g., 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 the enrolled 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.

11:090:101 section 10 index 14066

## 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.

11:090:101 section 11 index 14067

## 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 global obesity epidemic – while there are 900 million undernourished 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 Robson 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 07 index 08671

## 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 Itself* 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.

01:090:101 section 62 index 09946

## 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 mysteries and 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.

01:090:101 section 63 index PENDING

## 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 Lorenz'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.

01:090:101 section 66 index 08677

## Smart Eating and Living for a Healthy and Happy Life

**Judith Storch** (Nutritional Sciences)

**Chung Yang** (Pharmacy; Chemical Biology)

This course will be taught by Professors with expertise in food, nutrition, psychology and kinesiology to discuss how dietary habits, physical activity and a positive attitude can increase wellness and prevent diseases. Each session of the seminar will include lectures and discussions. The students are expected to be fully engaged by thinking about whether a certain idea can be applied to their daily lives, raising questions and participating in class discussions. Students will also participate in class exercises (or quizzes) by writing down their opinions on the subjects. In some sessions, there will be opportunities for small group discussions, student presentations and class debates. This course will also introduce our research expertise to students to stimulate their interests in multidisciplinary research and lifestyle changes toward health and happiness.

01:090:101 section 70 index 13929

## 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.

11:090:101 section 12 index 09014



## 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 individualized 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.

11:090:101 section 14 index 09065

## 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. We will explore the cognitive processes involved in 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 addictions, 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.

01:090:101 section 69 index 08823

## 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.

©RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY

PHOTOGRAPHY: courtesy of Rutgers Special Collections and University Archives, Rutgers Department of University Communications and Marketing, John Emerson, Don Hamerman, Joanna Kostrzewa, Gerald D. Meccia, Nick Romanenko, and Byrne Seminars' faculty and students.

[WWW.BYRNE.RUTGERS.EDU](http://WWW.BYRNE.RUTGERS.EDU)