Section 001: Introduction to Materials Research through Scanning Electron Microscopy
Dr. Carl Boehlert & Dr. Per Askeland, Department of Chemical Engineering & Materials Science
Mon. 9:10-10am; Max 16
This Research Seminar will allow students to learn about one of the most widely used tools in multidisciplinary materials-based research, a scanning electron microscope (SEM). Students will focus on SEM analysis of ceramics, composites, biomaterials, metallic alloys, etc. The students will also be responsible for performing a materials-based research project using the SEM and presenting their research through a poster display at the University Undergraduate Research and Arts Forum (UURAF) in April 2023.

Section 002: From Atomic Nuclei to Stars: Research at the National Superconducting Cyclotron Laboratory & Facility for Rare Isotope Beams
Dr. Georg Bollen & Colleagues, NSCL/FRIB and Department of Physics and Astronomy
Thurs. 5-6:20pm; Max 10
For more than 50 years, scientists from MSU and all over the world have been conducting nuclear physics research at the National Superconducting Cyclotron Laboratory, producing and studying exotic nuclei, discovering new phenomena and creating new theoretical models to explain and predict nuclear characteristics. These exotic nuclei are important for nuclear astrophysics and the formation of elements. And with the nearing completion of the Facility for Rare Isotope Beams, the most powerful heavy-ion accelerator in the world, there are even more opportunities to study nuclear science and accelerator science. In this Honors Research Seminar, students will learn about some of the exciting research projects that NSCL/FRIB faculty are working on, and they will join a research group to get hands-on experience in areas at the forefront of nuclear and accelerator science.

Section 003: The Politics of Confirming Judges
Dr. Ryan Black, Department of Political Science
Tues 3-3:50pm; Max 20
Where does true political power live in the United States? In the White House at 1600 Pennsylvania Avenue? Nope. On First Street under the dome of the US Capitol? Wrong again. Nearly every aspect of your life is governed by the rulings of the more than 800 federal judges and justices who decide hundreds of thousands of cases each year. These judges hold their jobs for decades and, unlike members of Congress or presidents, will never be subject to those pesky things we call elections. How do you get to this exalted position of power? Today, all you need to do is convince 51 (very specific) people to support your confirmation. Who are these people and how do they get confirmed to become a federal judge? We don't really know, so that's what we'll be investigating together if you enroll in this seminar.

Section 004: Democratic Discourse and Critique: The Middle East Voices of the Arab Uprisings
Dr. Russell Lucas, James Madison College & Department of Linguistics, Languages & Cultures
Dr. Camelia Suleiman, Department of Linguistics, Languages & Cultures
Mon. 10:20am-12:10pm; Max 15
Since 2010, the Arab world has witnessed protest movements in nearly every country of the region. These protests have brought down dictatorships that had lasted a generation by offering the promise of democracy and social justice. The uprisings, however, have also resulted in civil wars, social strife and international interventions. This course will investigate the roots of these events (historic with a specific focus on the Middle East as it emerged from WWI, social, political), the course of their events, and their current status through many genres – including autobiography, news reports, film, fiction, blogs, and video – as well traditional academic sources. Students will explore the emerging variety of voices in the Arab world through these different media in order to engage with their generational peers from the Middle East. The course will also be introducing students to the basic tenets and principles of Islam, the dominant religion in the Middle East. The focus will be on Syria and its humanitarian crisis.

Section 005: Creativity in the Time of COVID-19: A Primary Research Study of Members of the MSU Community
Dr. Nancy Dejoy, Department of Writing, Rhetoric & American Cultures
Tues. 4:30-5:50pm; Max 8
This seminar focuses on research related to a Mellon Foundation “Just Futures” grant that focuses on how the COVID-19 pandemic has disproportionately affected members of populations with histories of discrimination and injustice, and how they use creativity to cope. We will focus our primary research on how members of those populations at MSU are experiencing the pandemic and how, if at all, they are using creativity in response to the challenges of the pandemic; the major project of the seminar will be primary research related to this topic. We will also look at pandemic art that responds to the disparities of the effects of COVID on under-represented populations and travel to at least one site that exhibits art related to the seminar.
theme (to be identified according to the interests of the group; fall or spring depending on when we can travel safely). We will also attend the Lansing Creative Placemaking summit and attend sessions related to the seminar topic and to student areas of interest. Students will keep a journal to explore their own experiences of the COVID-19 pandemic and find inspiration for their creative projects and will be introduced to a variety of production and presentation mediums for their creative work, including digital, plastic, and performance mediums.

Section 006: Can Machine Learning Enhance Team Performance?
Dr. Hanzhe Zhang, Department Economics & Colleagues
Tues. 9-10:50am; Max 10
Teams require smooth coordination and integration of ideas when many individuals interact in a complex social network structure at sub-team and project team boundaries within and outside of their disciplines and organizations. With this motivation, a trans-disciplinary team of engineering, construction management, computer science, education, social networks, organizational psychology, and economics experts, supported by a $1.44 million National Science Foundation Future of Work grant, has been developing intelligent social network interventions to enhance team performance. We have gathered data on communication (emails, meeting recordings, meeting minutes), longitudinal surveys, and interviews for three authentic teams and twenty student project teams (approved by IRB), and we will continue to gather data of (about twenty more) student teams who received interventions to improve their performance until Spring 2023. The students are expected to help with data collection and analyses of student and authentic teams. The students are expected to present their findings from data analyses at University Undergraduate Research and Arts Forum in Spring 2023.

Section 007: Molecular Phylogenetics and Evolution
Dr. Patrick Edger, Department of Horticulture
Wed. 5:10-6:30pm; Max 12
Our understanding of evolution has been revolutionized by the ability to study the processes of genetic change at the molecular level. This seminar course will cover the mathematical, computational and molecular techniques required to explore the evolutionary diversity of the planet’s molecular (DNA) sequences and estimate the evolutionary relationships among species. This course will introduce students to tree thinking – how to correctly interpret phylogenetic trees. Phylogenetic trees serve as a powerful framework to estimate the timing of divergence events, analyze geographic distribution of species, and investigate the origin of evolutionary novelties. In addition, this course will provide students the opportunity to gain valuable hands-on experience with generating and analyzing their own data. Students will also be provided an opportunity to publish their research (as part of a larger class project) in a peer reviewed journal, and present their research at the University Undergraduate Research and Arts Forum.

Section 008: 3D-Printing and Digital Image Correlation Analysis of Structures
Dr. Weiyi Lu, Department of Civil & Environmental Engineering
Mon. 3-3:50pm; Max 12
This Honors Research Seminar (HRS) aims to develop an intuitive understanding on structural behavior of students by visualizing deflection and internal force development in structures. Two emerging techniques, i.e., the 3D-printing and digital image correlation (DIC) techniques, will be introduced for rapid fabrication of small-scale structures and non-contact strain field measurements. Key concepts related to Civil Engineering, Materials Science and Engineering, and Mechanical Engineering will be covered. Students will apply the knowledge and the advanced experimental skills learned in this seminar to design structures. The outcomes of the creative design projects will be disseminated at the annual University Undergraduate Research and Arts Forum (UURAF) in April 2023.

Section 009: Wireless Physiological Sensors
Dr. Chunqi Qian, Department of Radiology
Fri. 4:10-5pm; Max 10
This research seminar will guide students to learn the fundamental principles of wireless physiological sensors1 and to exploit their broad range of applications. This seminar will allow a team of 10 students to fabricate wireless powered sensors and to demonstrate their usage in a variety of application scenarios that are relevant to students’ future career paths. This project will not only allow students to get exposed to the basic principle of bioinstrumentation, but also improve their problem solving and critical thinking capability through a combination of independent pursuit and teamwork.
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Section 010: Health Promotion and Stress Management among Low-income Diverse Populations
Dr. Jiying Ling, College of Nursing
Fri. 9:10-10am; Max 10
This seminar will provide opportunities to contribute to several health promoting projects among low-income families who may experience food insecurity and high level of stress. Students will have the opportunity to be part of a multidisciplinary team and gain hands-on experiences in participant recruitment, data collection, program teaching, evaluation, and dissemination. Every involved student will have the opportunity to present their scholarly project at the 2023 UURAF and other scientific conferences and participate in manuscript writing. Students will also have the opportunity to learn about the safety and efficacy of study trials.

Section 011: Holistic Analyses of Complex Infrastructure Systems
Dr. Steven Safferman, Department of Biosystems & Agricultural Engineering
Wed. 3-4:20pm; Max 9
Students will learn to recognize, model, and research complex infrastructure systems, including the consideration of coupled human and natural systems in various scales and contexts. Understanding the mechanisms behind complex systems and working across disciplinary specialties are more effective ways to address current, complex environments. Students will conduct a research project on rural, suburban, and urban development, decline, and redevelopment.

Section 012: Promoting Physical Activity and Healthy Eating Among At-Risk Adolescents
Dr. Lorraine Robbins, College of Nursing
Wed. 4:10-5pm; Max 14
Students will be actively engaged in various areas of a NIH-funded research project that focuses on testing a multi-component intervention to improve physical activity and eating habits among 10- to 14-year-old racially and ethnically diverse adolescents in low-income urban areas. One parent per adolescent will also be involved to provide support for the adolescent’s positive behavior change. Students participating in the program will engage in a 50-minute seminar every month during the fall and spring and will work 5 hours per week with research staff to acquire a variety of valuable research skills. Students will present the results of their research projects at the University Undergraduate and Arts Forum (UURAF). Location: College of Nursing. Travel to schools will be provided.

Section 013: Sustainable Finance: US vs Europe
Dr. Antoinette Tessmer, Department of Finance
Fri 10-10:50am; Max 15
This seminar investigates the impact of sustainability on financial markets in the US and in Europe. Participants will conduct research in collaboration with students from the University of Namur, Belgium to compare and contrast the effects of sustainable finance on US and European financial markets. Is/should the concept of stock “value” be sustainability dependent? Is the perception of investment “risk” enhanced or reduced by sustainability? Have European markets embraced sustainability more proactively than or differently from US markets? How do your understandings, beliefs, and values about sustainable finance as an American student compare to students in Belgium? How may internationally and interculturally implicated beliefs and values shape decision making in sustainable investment? If you are intrigued by those questions, we invite you to join the conversation. The seminar gives an opportunity to manage a simulated $1M stock portfolio and to enhance your global awareness.

Section 014: Gender Diversity and Sexuality in Africa
Dr. Jonathan Choti, Department of Linguistics, Languages & Cultures
Wed. 11am-12:20pm; Max 15
This seminar will allow students to explore and learn about gender diversity and sexual orientation as experienced in continental Africa. Topics such as gender roles, diversity, equity, inclusion, social justice, LBGTQ+, and human rights will feature in this seminar. Students in this seminar will read articles and other texts, watch movies and video clips, collaborate remotely with undergraduate students in East African universities, and interview members of the MSU community from Africa to gather information. They will work in small teams on individual research projects on gender diversity and sexuality in Africa. They will write individual research papers, and make in-class PowerPoint presentations and poster presentations at the spring 2023 University Undergraduate Research and Arts Forum (UURAF). They will have the option of publicizing their research findings in other external venues such as peer-reviewed journals on women’s studies and sexuality.
Section 015: Sociomobility
Dr. Peter Savolainen, Department of Civil & Environmental Engineering
Tues. 9-10:20am; Max 15
Autonomous vehicles (AVs) offer the potential for significant improvements in the mobility, safety, accessibility, and sustainability of transportation systems. As the automotive industry continues rapid advances in the technical domain, there are a myriad of associated social consequences that will result from large-scale deployment. However, these consequences are not well understood, and there is an imminent need to train students in sociomobility -- an area of research at the intersection of engineering and the social sciences. The proposed Honors Research Seminar (HRS) will allow students to gain meaningful, hands-on experience in research that is focused on the development of innovative, multidisciplinary solutions that jointly address both the technical and societal aspects of our ongoing transition towards an automated vehicle fleet. The students will gain immersive, hands-on experience in addressing sociomobility issues, furthering our understanding of both the technological capabilities and societal implications of new mobility solutions that are introduced in complex social systems.

Section 016: Experimental Mathematics
Dr. Robert W. Bell & Richard Edwards, Lyman Briggs College & Dept. of Mathematics
Wed. 3-3:50pm; Max 8
Students will use the Python programming language and the SageMath computer algebra system to explore topics in current mathematical research. Students will work in small teams and learn to collaborate and communicate effectively. Students will have the opportunity to explore problems beyond what is typically encountered in undergraduate mathematics course work and, thereby, gain a better understanding of what constitutes research in the mathematical sciences. By the end of the first semester, students will be fluent in the design and implementation of basic mathematical simulations in both Python and SageMath. Previous programming experience is not required. Students are expected to have completed one semester of calculus at the level of MTH 132 or LB 118.

Section 017: Critical Making to Solve Wicked Problems
Dr. Isaac Record, Lyman Briggs College
Fri. 10:20-11:40am; Max 8
In this Honors Research Seminar, students will engage in a practice called “critical making,” which combines traditional humanities and social science research techniques with creative/constructive making to explore research topics selected by students. Students will follow a process of identifying a problem; multimodal research into the problem; revising the problem definition in light of the research findings; exploring multiple potential solutions from social, technical, economic, ethical, institutional, and ecological perspectives; prototyping several potential solutions; applying a genuine test to those solutions, and creating a plan for further development. The aim is to address “wicked problems,” those that seem intractable and even hard to define, through a genuinely interdisciplinary methodology. Students are encouraged to identify problems relevant to their own lives. Students will have access to the Collaborative Experiential Learning Laboratory, or CELL, a new maker space in Holmes Hall. In the past, students have addressed issues like access to women’s reproductive healthcare, waste in dining halls on campus, and compliance with prescribed medication.

Section 018: Into the Field: Studying Language, Culture, and Identity across Local and Global Contexts
Dr. Stephen Fraiberg, Dept. of History
Mon. 3-4:20pm; Max 12
This course will investigate cultural and linguistic landscapes in communities across the world. To accomplish these aims, we will draw on a research tradition referred to as ethnography. Ethnographers are people who go into the “field” to study linguistic and cultural activities in the context of people’s everyday lives. Drawing on this rich body of research, we will examine a range of cultures, rituals, practices, and people: refugees, immigrants, gangs, graffiti, social media sites, Native Americans, middle school girls, the homeless on the sidewalks of New York, and an array of communities and contexts located around North America and the world. Drawing on cases and examples from this scholarship, we will conduct our own ethnographic research on specific sites across the university and local communities grounded in your own interests and areas of focus: video gaming, theater troupes, hip-hop, food banks, tattoos and piercings, martial arts, fine arts, anime, manga, sports teams, debate teams, startup innovation hubs, environmental movements, and more. Based on fieldwork in these areas, we will write-up ethnographic accounts documenting local language and cultural practices, and present our findings at the University Undergraduate Research and Arts Forum (UURAF).
Section 019: Data and Stories: Multidisciplinary Approaches for the Study of Social Issues
Dr. Louise Jezierski, James Madison College
Lee Peralta, Department of Statistics & Probability
Tues. 5-6:20pm; Max 10
The seminar aims to engage students in multidisciplinary approaches for the collection, analysis, and communication of data relevant to public affairs. Students will learn to engage in critical consumption and production of social issue narratives and their visualizations, including archival and historical documents, statistics, mapping, websites, video, and social media, as well as learn to use these skills to craft compelling stories appropriate for public consumption. The seminar will culminate in a collaborative project of creating, disseminating, and analyzing a survey on data visualization literacy among MSU residential college students. Students will be provided the opportunity to publish their research results in a peer reviewed journal and/or present their research at the 2023 University Undergraduate Research and Arts Forum.

Sect 020: The Performing Arts and Society
Dr. David Biedenbender, College of Music
Dr. David McCarthy, Residential College in the Arts & Humanities
Fri. 1-2:20pm; Max 18
The performing arts have been the site of numerous efforts since World War II to build more democratic social relations. Students in this class will develop an interdisciplinary perspective on these efforts through direct engagement with an eclectic body of primary and secondary sources, including works by experimental artists and socialist critics. They will complete independent research projects on specific case studies and apply their developing knowledge to the design and implementation of actual performing arts events, collaborating with one another and with community partners. No prior training or experience is required. Students will be encouraged both to use their own existing skills and to experiment with new skills.

Sect 021: Sensorimotor Control and Upper-limb Coordination
Dr. Florian Kagerer, Department of Kinesiology
Tues. 4:40-6pm; Max 12
Students will gain an understanding of the human sensorimotor system, of concepts such as feedback and feedforward control, how movement affords perception (and vice versa). Research will include thinking through experimental designs, modifying existing programs controlling stimulus presentation and movement recording, conducting motor behavioral experiments in humans, and data reduction using Matlab and/or R. Student teams will present their studies at the University Undergraduate Research & Arts Forum (UURAF) in April 2023.

Sect 022: The Sands of Mars: Assessment of Potential Microbial Habitability and Anticipation of Mars Sample Return
Dr. Michael Velbel, Department of Earth & Environmental Sciences
Tues. & Thu. 4:10-5pm; Max 15
The scientific search for evidence of past or present life on Mars is based on the search for evidence of liquid water, and evidence for the physical state and chemical composition of that water. Much evidence for the state and composition of past water is preserved in the minerals that may have reacted with past, no-longer-extant, water. To improve interpretation of the environmental significance of the coarsest grains imaged using the Phoenix Optical Microscope, student participants in this seminar will examine the shapes and surface textures of sand grains in instrumentally acquired images of sand from the Phoenix Mars Lander landing site on Mars and compare their attributes with those of similar grains in images from other past and currently operating Mars surface missions and of well-studied terrestrial (mostly basaltic) analogs. Beginning with visual and simple quantitative classification methods used by geologists to characterize and describe sediment-grain shapes and surface textures, student participants will examine a variety of grain types in representative mission and analog-sample images and make preliminary assessments of the alteration, transport and deposition / accumulation histories of the sands.

Sect 750: Immigration and Cultural Diversity in Israel
Dr. Yore Kedem, Department of Linguistics, Languages & Cultures
Tues. 5-6:50pm; Max 12
This Honors College Seminar Abroad will introduce Honors College students, Academic Scholars Program students and Jewish Studies minor students (Honors College membership not required) to research through the lens of immigration and cultural diversity in Israel. Immigration, cultural diversity, and inter-cultural relationships present important issues for many countries in the world, and Israel is a unique context to study these topics. Students participating in the program will engage in weekly research seminars during the fall on MSU’s campus, an 18 day field research experience in Israel during winter break,
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and weekly research seminars during the spring on MSU’s campus. Students will present the results of their research projects at the University Undergraduate Research and Arts Forum (UURAF).

Open to Honor College and Jewish Studies students (all levels). Course dates: Tues., 5-6:50 p.m. (Oct. 4-Dec 6), 208 Eustace-Cole Hall; Winter break in Israel (Dec. 18-Jan. 4); Tues., 5-6:50 p.m. (Jan. 10-Feb 28), 208 Eustace-Cole Hall. Students enroll in two courses (7 credits) fall semester with grades deferred until spring. To request an override to enroll, contact Dr. Yore Kedem, ykedem@msu.edu. For more detail visit: https://honorscollege.msu.edu/programs/israel-honors-research-seminar.html