Section 001: Introduction to Materials Research using a Scanning Electron Microscope
Dr. Carl Boehler & Dr. Per Askeland, Department of Chemical Engineering & Materials Science
Fri. 3-3:50pm; Max 16
Introduction to Materials Research through Scanning Electron Microscopy: 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 2022.

Section 002: From Atomic Nuclei to Stars: Research at the National Superconducting Cyclotron Laboratory
Dr. Georg Bollen & Colleagues, NSCL/FRIB and Department of Physics and Astronomy
Thurs. 5-5:50pm; 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 (NSCL), producing and studying the properties of exotic nuclei, discovering new phenomena and creating new theoretical models to explain and predict nuclear characteristics. The same exotic nuclei are also participating in stellar events, defining the energetics of supernova explosions and guiding the synthesis of the elements we see around us. In this Honors Research Seminar students will learn about some of the exciting research projects that faculty at NSCL are working on, and they will join a research group to get hands-on experience in areas at the forefront of experimental or theoretical nuclear science.

Section 003: The Science of Human Connection and Close Relationships
Dr. William Chopik, Department of Psychology
Tues 3:30-4:50pm; Max 15
This seminar will explore the science behind human connection and close relationships—an interdisciplinary field that asks deep questions about the uniqueness of humans and their loved ones. Students in the seminar will read and discuss articles on the science of close relationships and work in small teams on individual research projects on human connection. The results of these projects will be presented at the 2022 University Undergraduate Research and Arts Forum, and students will be given additional research dissemination opportunities.

Section 004: Democratic Discourse and Critique: The Middle East Voices of the Arab Uprisings
Dr. Camelia Suleiman, Department of Linguistics & Languages
Mon. & Wed. 12:40-1:30pm; 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.

Section 005: Creativity in the Time of COVID-19: Art as a Tool for Combating Inequity and Injustice
Dr. Nancy Dejoy, Department of Writing, Rhetoric & American Cultures
Mon 4-5:20pm; Max 8
This seminar focuses on research related to a Mellon Foundation Just Futures grant. The grant focuses on the ways that 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 interdisciplinary secondary research on the histories of the ways people from these groups use creativity to work for equity and social justice. The major project of the seminar will be an annotated bibliography of the readings we identify and collect. We will also identify 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) and attend one local conference related to public art movements.
Section 006: Digital Theatre
Dr. Alison Dobbins, Department of Theatre
Tues. 3-3:50pm; Max 10
Seminar will cover key concepts at the forefront of digital theatre: combining music, programming, theatre and Slm. Students will be introduced to a variety of audience interaction methods currently being used in the Selid. The goal of this seminar is to equip students with the skills to integrate an artistic and analytic approach to solving problems.

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: Global Slums, Migration, and Inequality
Dr. Guo Chen, Department of Geography, Environment & Spatial Sciences
Fri. 11-11:50am; Max 15
The seminar will engage students in examining global trends of poverty and inequality based on geographic measures, reading classical geographical texts and theories on inequality and poverty, and critically analyzing cases of inequality and poverty on multiple scales. A comparison of global slums will be the empirical focus of the second half of the course.

Section 009: Integrated Biosensors and Magnetic Resonance Imaging
Dr. Chunqi Qian, Department of Radiology
Fri. 3-4:20pm; Max 10
This research seminar will guide students to learn the fundamental principles of wireless physiological sensors and Magnetic Resonance Imaging. The goal of this project is to design and fabricate wireless powered signal detectors and to demonstrate their application for pressure sensing both outside and inside an MRI scanner environment.

Section 010: Health Promotion among Diverse Populations
Dr. Jiyin Ling, College of Nursing
Tues. 12-12:50pm; Max 10
Students will actively participate in two health-promoting projects with low-income families who have young children enrolled in Head Start programs: 1) one project is the NIH-funded “FirstStep2Health” healthy eating and physical activity intervention to promote healthy lifestyle behaviors and reduce obesity among low-income parents and children; and 2) the other project is the Michigan Health Endowment Fund-funded “Happy Family, Healthy Kids” stress management and healthy eating intervention to reduce stress and promote healthy eating among low-income parents and children.

Section 011: Examining Coupled Human and Natural Systems to Address Complex Environments
Dr. Steven Saffer & Mr. Steve Marquie, Department of Biosystems & Agricultural Engineering
Dr. Georgia Peterson, Department of Forestry
Wed. 3-4:20pm; Max 12
Students will learn to recognize, model, and analyze coupled human and natural systems (CHANS) 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 by apply CHANS concepts.
Section 012: Virus Adhesion to Surfaces  
Dr. Volodymyr Tarabara, Department of Civil & Environmental Engineering  
Tues. 5-5:50pm; Max 8  
Fundamentals and implications for public health. This Honors Seminar provides an opportunity to learn why and how viruses attach to various surfaces and how this knowledge can help safeguard public health. The seminar will cover foundational aspects of virus adhesion and train students on basic laboratory techniques of virus characterization. Hands-on training will only involve non-pathogenic viruses. Working in small teams, the students will select one or more viruses and one or more archetypal surfaces to assess virus/surface pairs in terms of likelihood of virus attachment. The selection will prioritize urban settings and scenarios relevant for protecting essential workforce (e.g., hospital personnel, municipal wastewater treatment plant operators). In their projects, the student teams will rely on literature data and employ adhesion models learned in the seminar. The projects will lead to conference papers and presentations at the annual University Undergraduate Research and Arts Forum in April 2022.

Section 013: DEI on Wall Street  
Dr. Kirt Butler & Dr. Antoinette Tessmer, Department of Finance  
Fri 9:10-10:00am; Max 15  
This seminar will introduce students to the world of stock investment (Financial Analytics) while addressing the state of DEI on Wall Street (Behavioral Finance).

Section 014: Inquiry in Numbers  
Dr. Olga Turanova & Dr. Preston Wake, Department of Mathematics  
Wed. 1:50-3:10pm; Max 10  
A student-led introduction to number theory, including prime numbers, factorization, and modular arithmetic. No prior experience with math necessary.

Section 015: History and Testimony in the Digital Age: Studying the Holocaust  
Dr. Steven Weiland, Department of Educational Administration & Faculty Colleagues in the Jewish Studies Program  
Thurs. 2-3:20pm; Max 15  
This Honors College Seminar will offer participants an opportunity for work in a unique digital resource for studying the Holocaust. Together with reading and discussing a one volume account of the Holocaust they will have access to the extraordinary USC Shoah Visual History Archive via the MSU Library. Working individually and in small groups with MSU faculty from several departments, and meeting in the seminar format, students will explore these questions: 1) What can be learned about the Holocaust and anti-Semitism from the perspective of those who survived to tell their stories? 2) What are the best methods for learning from testimony as a form of historical evidence? And 3) How can the evidence of testimony best be incorporated into Holocaust research and presented, including the use of digital resources? The focus will be on capitalizing on digital resources to complement those in print in doing research in a domain of inquiry with profound historical and personal multi-media meanings. And students can learn about the uses of digital multi-media presentations in their academic work beyond the Seminar itself.

Section 016: Experimental Mathematics  
Dr. Robert W. Bell & Richard Edwards, Lyman Briggs College & Dept. of Mathematics  
Fri. 3-4:20pm; Max 9  
Students will use computer algebra software to explore topics in current and historical 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 have a basic understanding of the SageMath computer algebra system and the Python programming language. Previous programming experiences not required. However, it is expected that students will have completed one semester of calculus at the level of MTH 132 or LB 118.
**HONORS RESEARCH SEMINARS 2021-22**

**3 CREDITS * FALL & SPRING SEMESTERS * PASS-NO PASS * POTENTIAL INTEGRATIVE STUDIES SUB**

**Section 017: The Ancient Greeks and Us: Mapping the Past, Sizing up the Spartans**

Dr. Noah Kaye, Dept. of History  
Tu & Th. 3-3:50pm; Max 15  
In 2020, the country’s medical establishment grapples with the Hippocratic oath, named for an ancient Greek doctor, which presents ethical obstacles for so-called challenge studies for a COVID-19 vaccine. On social media, pundits debate the origins of election results in terms riven with memes drawn from the pages of Thucydides, an ancient Greek historian and political theorist. The MSU campus is splashed with signage about the original Spartans – and their helmets. But who were the Spartans? Who were the ancient Greeks and why do they still matter today?

**Section 018: Into the Field: Studying Language, Culture, and Identity across Local and Global Contexts**

Dr. Stephen Fraiberg, Dept. of History  
Wed. 3-4:20pm; Max 10  
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” in order 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 field work 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: Companion Animal Welfare: Breed, Behavior and Animal Sheltering**

Dr. Jacquelyn Jacobs, Dept. of Animal Science; Dr. Laura Reese, School of Planning, Design & Construction  
Wed. 1-2:50pm; Max 10  
This Honors Seminar will focus on topics related to animal welfare, behavior, and animal sheltering. While Michigan has recently been declared a “No Kill” state, meaning that on average licensed shelters and rescues find homes for 90% of adoptable animals in their care, such a designation is not necessarily what it seems. First, the 90% live release is based on an average which means that many shelters fall below that figure. Second, the definition of “adoptable” may vary from shelter to shelter based on how the animal’s health and behavior are assessed in each case. Finally, there are many states far below the No Kill standard, thus identifying practices to boost live release from shelters across the country is still critically important. Students in this seminar will have the option of participating in one of two research projects designed to provide information to the animal sheltering profession on how best to increase live release rates. One project will focus on dog breeds, behavior testing practices in shelters, and the potential connection (or lack thereof) between breed mix and behavior. The second project will assess best practices in animal shelters related specifically to programs that try to get the best match between personality of the dog and the potential adopter and cooperative transfer programs that facilitate the movement of animals from overcapacity shelters to those with more space and potential adopters. The research will include direct observation of dog behavior testing, quantitative analysis of survey data, qualitative interviews with animal shelter staff, and field visits to animal shelters in the Lansing area and in Detroit. The course will be presented from the perspectives of both animal science and public policy and will directly impact practice in animal sheltering.

**Section 750: Immigration and Cultural Diversity in Israel**

Dr. Yore Kedem, Department of Germanic, Slavic, Asian and African Languages  
Tues. 4:10-6:00pm; Max 12  
This Research Seminar Abroad will introduce first and second year students 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. Israel, a state which encourages immigration, and therefore is very culturally diverse, is a great site to investigate these issues. Students participating in the program will engage in weekly research seminars during the fall, a 15-day field research experience in Israel during winter break, and weekly research seminars during the spring. Students will present the results of their research projects at the University Undergraduate and Arts Forum (UURAF). Students will be enrolled in the fall for two courses totaling 7 credits (UGS 200H, Section 750 and JS 390) that will begin in the Fall and continue into the Spring. Grades will be deferred until the spring. Meeting dates: Fall on campus 10/12 - 12/14; winter break in Israel 12/20 – 1/9; spring on campus: 1/10 – 3/8. Meeting location: Tuesdays 4:10-6:00 PM, 208 Eustace Cole Hall. To enroll contact Dr. Kristin Janka at kristini@msu.edu.