

UGS 200H: HONORS RESEARCH SEMINARS 2023-24

3 CREDITS * FALL & SPRING SEMESTER ENGAGEMENT REQUIRED * PASS-NO PASS *

POTENTIAL INTEGRATIVE STUDIES SUB – FOR HC STUDENTS ONLY

Section 001: Introduction to Materials Research through Scanning Electron Microscopy (NS)

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 2024.

Section 002: Identity and Cultural Diversity in Arab Immigrant Communities (AH/SS)

Dr. Ayman Mohamed, Department of Linguistics, Languages & Cultures

Wed 8:30-9:50am; Max 10

This seminar allows students to participate in a community-engaged learning experience to explore backgrounds, cultural identities, needs, frustrations and aspirations of the diverse Arab immigrant communities who reside in their localities. We will read scholarly work and research articles highlighting the Arab diaspora and investigating the ways in which identity continues to be imagined and re-constructed in and among Arab communities around the world. Through authentic material, documentaries, movies, and snippets of Arab literature, students will enhance their understanding of Arab cultural diversity, historical backgrounds, and migration and refugee movements in recent times. We will learn about the emergence and influence of Islam in Arab culture, religious and ethnic minorities within the Arab world and the origin and evolution of the Arabic language. Students will also discuss Arab Spring in different Arab countries, refugee crises and current challenges and opportunities. The learning experience will be enhanced through a field trip to neighboring communities and institutions. Students will write individual research papers and make in-class presentations and poster presentations at the spring 2024 University Undergraduate Research and Arts Forum (UURAF).

Section 003: From Atomic Nuclei to Stars: Research at the National Superconducting Cyclotron Laboratory & Facility for Rare Isotope Beams (NS)

Dr. Yue Hao, Dr. Paul Gueye, Dr. Sean Liddick, Dr. Kei Minamisono, Dr. Wolfgang Mittig, Dr. Artemis Spyrou, Dr. Ryan Ringle, Dr. Jaideep Singh, Dr. Vladimir Zelevinsky, Dr. Xilin Zhang, & Dr. Ting Xu, NSCL/FRIB and Department of Physics and Astronomy

Thurs. 5-5:50pm; Max 10

After an initial orientation meeting at the beginning of the semester, all of the HRS students are assigned homework to read and summarize the project information material prepared by each of the faculty mentors. During the second and third weeks of the semester, the students have one-on-one meetings with the faculty members in order to match students with mentors. As soon as the match is made the students will do research work under the guidance of their faculty mentors and associated research groups. In the middle of March 2024, the students will present their results to their fellow HRS participants and the faculty mentors. They will also prepare a poster or oral presentation for the University Undergraduate Research and Arts Forum (UURAF).

Section 004: Democratic Discourse and Critique: The Middle East Voices of the Arab Uprisings (AH/SS)

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 course will focus on Syria and its humanitarian crisis.

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Section 005: Teaching Critical Making to Solve Wicked Problems

Dr. Isaac Record, Lyman Briggs College

Tues 8:30-9:50am; Max 8

In this Honors Research Seminar, students will join me in studying a teaching method called “Critical Making,” which combines traditional humanities and social science “critical thinking” research techniques with creative and constructive making of physical models (Ratto 2011). We will learn the Critical Making process by using it to explore topics selected by students. At the same time, we will learn about the science of learning and conduct studies of Critical Making classroom practices taking place in another class I am teaching. The seminar will be organized as a regular Learning Lab meeting, with student researchers gaining experience, knowledge, and skill in a variety of research tasks, including formulating questions, reviewing literature, designing experimental studies, applying for IRB approval, analyzing results, and presenting conclusions. We will work as a team throughout the seminar, dividing work according to skill, interest, and need. Students may also contribute to a lesson plan for the subject course, and may optionally contribute to a paper in the scholarship of teaching and learning focused on best practices for Critical Making as a pedagogical tool.

Section 006: Integrating Health Eating into School Readiness Program

Dr. Jiying Ling, College of Nursing

Fri. 9-9:50am; Max 10

Students will actively participate in a translational research project among low-income preschoolers aged 3-5 years old. The project was funded by Michigan Health Endowment Fund and aims to integrate healthy eating education into the existing school readiness program among rural Head Start centers in Michigan. In addition, all students will participate in designing and implementing an experimental study to compare the activity and sleep data of two popularly used commercial activity trackers (Fitbit charge 5 and Amazfit Band 7 Fitness & Health Tracker) with the Actigraph (the current gold standard approach for monitoring activity and sleep). Students will act as both researchers and participants in the experimental study and learn how to use data to support research and practice decisions. Students will present the results at 2024 UURAF.

Section 007: The Practice of Magic (AH)

Dr. David Watson, Department of Writing, Rhetoric & American Cultures

Wed. 5:10-6:30pm; Max 15

This is a practical course in the study of magic. Students will learn theories of magic, systems of symbolic economy, ritual theory and practice, and study an array of primary magical texts and grimoires drawn from a number of magical traditions. Students will be expected to learn elements of spell-making, local herb-lore and folk medicine, to take stellar and lunar observations and measurements, construct magical devices and tools, and a variety of other skills. The seminar will culminate in the production of a piece of original spellwork, as well as an academic analysis of the techniques and symbolic elements utilized.

Section 008: Contemporary and Historical Perspectives on the Psychology of Time and Rhythm (SS)

Dr. Devin McAuley, Department of Psychology

Fri. 12:30-1:50pm; Max 12

This seminar will explore the contemporary and historical scholarly literature on the human experience of time and rhythm – a fascinating interdisciplinary topic that is central to the understanding of brains and minds. Students in the seminar will read and discuss scientific articles on the topic of time and rhythm perception and work in small teams of 2-3 individuals on the design and execution of behavioral experiments that investigate the neural and cognitive bases of time perception. Students will present the results of their projects at the 2024 University Undergraduate Research and Arts Forum.

Section 009: Multimodal Approaches for Wireless Physiological Sensing (NS)

Dr. Chunqi Qian, Department of Radiology

Fri. 4:10-5pm; Max 10

This research seminar will introduce students to the principles of wireless physiological sensing. Wireless physiological sensors are useful for chronic monitoring inside confined body cavities, where neither wired connections nor battery replacement are desirable. But conventional wireless detectors have limited detectability when they are lying deep inside the body. To overcome this limitation, students will be introduced to a battery-less sensor that can directly convert wireless power into radio-frequency carrier wave that can encode physiological information for long-range

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transmission. Then students will use this information to initiate their own projects that meet unmet needs for physiological sensors in fields they are most familiar.

Section 011: Predicting Maize Crop Growth through Genetics and Phenomics (NS)

Dr. Addie Thompson, Department of Plant, Soil & Microbial Sciences

Tues. 10:20-11:40am; Max 8

Machine learning. Big data. Smart ag. Genome to phenome. Data mining. All of these buzz words or phrases hit on some of the current key interests and targets of industry R&D, tech companies, and the agricultural sector, and represent the frontiers of research and data analysis. Sensor-based phenomics approaches not only save time and increase throughput, but enable researchers and farmers to acquire repeatable, objective data rather than subjective measures of plant health and condition, at high resolution, across multiple timepoints, for low cost. This seminar course will cover considerations and analysis of sensor-based data types from drone and robot platforms and will use these descriptive features in combination with genetic information (differences in DNA sequences) to predict how different varieties of corn grow and develop in unique and challenging environmental conditions. This course will introduce students to statistics and coding and introduce the basics of predictive modeling. Students will be provided an opportunity to publish their research, present at the University Undergraduate Research and Arts Forum, and the North American Plant Phenotyping Network conference in the spring semester.

Section 012: Bending and Breaking Reality: Exploring Cross-Disciplinary Scholarly Tools for Processing U.S. Historical Events 2016-present (SS)

Dr. Laura Dilley, Department of Communicative Sciences & Disorders

Fri. 3-4:20pm; Max 15

This seminar explores how internet-based communication technologies – once thought likely to usher in an era of techno-utopianism – are being used on grand scales both to create divisions in society and spread false information. We will process recent U.S. and world historical events through the lenses of computer-mediated communication and social cognitive neuroscience. To do so, we will draw on scholarly tools from a variety of disciplines, including sociology, anthropology, communication sciences, linguistics, advertising and public relations, and psychology.

Section 013: The Mathematics of Assortative Matching (SS)

Dr. Hanzhe Zhang, Department Economics & Colleagues

Fri. 8:30-9:50; Max 10

Assortative matching is the tendency for people to choose mates who are more similar (positive) or dissimilar (negative) to themselves in characteristics (e.g., education, height, weight, blood type) than would be expected by chance. The prevalence of assortative matching differs by society and time. Students will be introduced to new axiomatic measures of assortative matching for heterosexual couples (in two-sided marriage markets) and homosexual couples (in one-sided marriage markets), respectively. Empirically, students will examine the degree of assortative matching on college education and other socioeconomic characteristics across countries and periods and compare to these axiomatic measures. The data are derived from IPUMS USA (Integrated Public Use Microdata Series), and the IPUMS International that contains over 1 billion personal records from 547 censuses and surveys in 103 countries. The students are expected to present their findings from data analyses at the University Undergraduate Research and Arts Forum in Spring 2024.

Section 015: Avant-Garde Theatre: Crafting an Interdisciplinary Approach to Futurist Performance (AH)

Dr. Alison Dobbins, Department of Theatre,

Dr. Alexis Bacon, College of Music

Tues. 9-9:50am; Max 10

Seminar explores key concepts at the forefront of digital theatre: the integration of music, choreography, theatre, and film. Students will be introduced to a variety of devising methods currently being used in the field of performance and performance art. The goal of this seminar is to equip students with the skills to integrate an artistic and analytic approach to solving problems.

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Section 017: Sustainable Finance: US and Japan

Dr. Antoinette Tessmer, Department of Finance

Guanglong Pang, Department of Educational Administration

Fri 10-10:50am; Max 15

This seminar investigates the impact of sustainability on financial markets in the US and in Japan. Participants will conduct research in collaboration with students from Setsunan University, Japan to compare and contrast the effects of sustainable finance on US and Japanese financial markets. Is/should the concept of stock “value” be sustainability dependent? Is the perception of investment “risk” enhanced or reduced by sustainability? Have Japanese 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 compared to students in Japan? How may internationally and interculturally implicated beliefs and values shape decision making in sustainable investments? If you are intrigued by those questions, we invite you to join the conversation. This seminar gives an opportunity to manage a simulated \$1M stock portfolio and to enhance your global awareness.

Section 018: System Approach for Sustainable Agriculture Water Management (NS)

Dr. Younsuk Dong, Department of Biosystems & Agricultural Engineering

Dr. Steven Safferman, Department of Biosystems & Agricultural Engineering

Mon. 3-4:20pm; Max 9

Students will learn strategic approaches to address water scarcity challenges in agriculture and its relation to global population growth. This research seminar focuses on a system approach to improve water conservation and efficiency in agriculture, including social, policy, and innovative technology and practice components. Students will also understand the intended and unintended consequences of these components.

Section 019: History and Testimony in the Digital Age: Studying the Holocaust (AH)

Deborah Margolis, Librarian II/Associate Professor, Library Liaison to the Serling Institute for Jewish Studies & Modern Israel, MSU Library

Dr. Amy Simon, Farber Family Endowed Chair in Holocaust Studies & European Jewish History, Assistant Professor, James Madison College, History

Dr. Lynn Wolff, Associate Professor, German, Affiliate Faculty Serling Institute for Jewish Studies & Modern Israel
Tues. 9:10-10am; Max 16

This Honors College Seminar will offer participants an opportunity for work in a unique digital resource for studying the Holocaust. They will have access to the extraordinary USC Shoah Foundation 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 antisemitism 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 uses of digital resources? The focus will be on capitalizing on digital resources in doing research in a domain of inquiry with profound historical and personal meanings.

Sect 020: Health Promotion Among Diverse Urban Adolescents

Dr. Lorraine Robbins, College of Nursing

Tues. 4:10-5pm; Max 15

This seminar will provide opportunities to contribute to a research project to promote healthy eating and physical activity among racially and ethnically diverse adolescents living in urban communities. Students will have the opportunity to be part of a multidisciplinary team and gain hands-on experiences in participant recruitment, data collection, intervention delivery, evaluation, and/or dissemination. Every involved student may have the opportunity to present their scholarly project at the 2024 UURAF and other scientific conferences and may participate in manuscript writing. Students will also have the opportunity to learn about the safety and efficacy of study trials.

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Section 021: Inquiry in Numbers

Dr. Olga Turanova, Dept. of Mathematics

Dr. Preston Wake, Dept. of Mathematics

Mon. 4:40-6pm; Max 10

An introduction to number theory, including prime numbers, factorization, and modular arithmetic. The learning will be student-led: the instructors will provide exercises that will lead the students to formulate, discover, and prove some of the main results of elementary number theory. Many exercises will be done with pencil-and-paper, and some will require writing code. The students will also be responsible for keeping a collaborative record of what the class discovers, which will serve as a “textbook” to refer to during the research portion of the course. Prerequisite: a solid understanding and comfort with high-school level mathematics. No calculus experience is necessary.

Sect 022: The Sands of Mars: Assessment of Potential Ancient Microbial Habitability and Preparation of Mars Sample Return (NS)

Dr. Michael Velbel, Department of Earth & Environmental Sciences

Tues. & Thu. 3-3:50pm; Max 16

The Sands of Mars seminar participants investigate grain shape (form and surface texture) of sand grains in instrumentally acquired images of sand from the landing sites and operation areas of Mars landers and rovers and compare their attributes with those of similar grains in images from other well-studied terrestrial (mostly basaltic) analogs and simulants. Depending on mission progress and program priorities at the time of the seminar, we may (1) make preliminary assessments of the grain’s alteration, transport and deposition / accumulation histories; (2) fill knowledge gaps about paleoenvironmental/paleohabitability indicators and potential biosignature preservation and/or physical-textural-mineral biosignatures in anticipation of future laboratory analysis of eventually returned samples; and/or (3) characterize Mars and lunar regolith simulants to anticipate the physical properties of local regolith feedstocks for future “made on Mars” construction materials.