DA/SGA	Course Abbreviation and Number:	Course Name:	Course Description:	CRN:	Instructor	Prerrequisite
ABB	BMES 2004	Concussion Perspectives	Broad, multidisciplinary description of concussion as it relates to variety of fields including: medicine, psychology, biomedical research, technology, equipment design, ethics, and law. Concussion modeling, diagnosis and treatment. Testing and instrumentation. Research efforts, credibility and conflicts of interest. Ethical considerations in sports, medicine, and science. Legal implications	11821	Duma	None
ABB	CMST 2134	Intro to Health Comm	Introduction to health communication with a focus on current issues and perspectives, including patient-provider communication, cultural conceptions of health and illness, media portrayals of health, communication in health organizations, health communication theories, information technologies in health communication, ethical considerations, and health promotion campaigns.	12913, 21856	Adrianne Holz Ivory, Shinault	none
ABB	HD 2004	Adulthood and Aging	Introduction to adult development and aging (gerontology). Basic concepts, principles, and issues of development across the adult years	15902, 15905,15904,	Katz, Patel, Scott-Poe	None
ABB	HD 2014	Integrative Practices for Health, Well Being, and Resilience	Examination of multidemensional factors (e.g., stress, personality, relationships, & social environment) influencing health across the lifespan. Engagement in evidence-based, therapeutic and preventative practices for promoting health and managing chronic conditions.	15906	Komelski	None
ABB	HD 4714	Senior Capstone Project	Intensive learning experiences in critical thinking and analysis. Opportunities to demonstrate breadth of learning while developing leadership skills and honing professional competencies. Topics include leadership and team development, problem solving, grant writing, program evaluation, and electronic portfolios. Senior standing in Human Services required	15933, 15935, 15934	Shivers, Komelski, Kim	None
ABB	HIST 3724	Disease, Medicine, and Health	Development of Western concepts of disease, medicine, and health with emphasis on period from eighteenth century to present. Social construction of disease and relationship between health and social, economic, and political structures. Special attention to impact of public health and the development of scientific and technological medicine.	16046	Monique Dufour	None
ABB	NEUR 2025	Introduction to Neuroscience~~II~~	Introduction to the fundamental principles of neuroscience. 2025: Structure and function of central nervous system in humans and other animals, signal processing and transmission, development of neural and brain circuits, encoding and transmission of sensory and perceptual information, motor control/movement. 2026: Complex brain processes including learning, memory, emotion, decision making, social behavior, and mental and functioning.	18377	Olsen	BIOL 1005 (MIN grade of P) or BIOL 1105 (MIN grade of P) or ISC 1106H (MIN grade of P)
ABB	NEUR 2026	Introduction to Neuroscience	Complex brain processes including learning, memory, emotion, decision making, social behavior, and mental and functioning.	18378	Clinton	NEUR 2025 (MIN grade of P)
ABB	PHS 3534	Drug Education	Interpretation of multidimensional (social, psychological and physiological) scientific data regarding drugs. The major drug categories will be covered with special emphasis on substance misuse and abuse.	18797	Amy Smith	None
ABB	PHS 3634 (HNFE 3634)	Epidemiologic Concepts of Health and Disease	Designed to give students in the health sciences a basic understanding of the modern concepts regarding health and disease as well as skills in organizing epidemiological data, disease investigation and surveillance. Includes a survey of terms, concepts, and principles pertinent to epidemiology. Lifestyles of populations and the relationships between lifestyles and health status are studied.	18798, 16101	Rachel Silverman	none

ABB	PHS 5034	Health Behav & Health Ed	This course has two main purposes: (1) to familiarize students with historical, theoretical and methodological aspects of health psychology, and (2) to acquaint health education students with the social, psychological, and cultural determinants of health behaviors which form the underpinnings of health education practice.	18809, 21602	Hosig	none
ABB	PHS 5714	Health of the Elderly	The health needs and problems of the elderly, the implications for those working with the elderly, and possible health care delivery systems.	18815	Deagle/Redican	none
ABB	PSYC 2064	Introduction to Nervous Systems and Behavior	Introduction to biological factors that produce behavior. Neuroanatomy and neurophysiology. The development of the nervous system, and neuroplasticity. Basic biological processes pertaining to sensation and perception. Conducting neuroscience research, and evaluating neuroscience-related claims in the popular media. The ethical and responsible use of nonhuman animal subjects; the ethical application of research findings in neuroscience to current problems such as psychopathy and neurodegenerative disease.	193897, 19388, 19389	Raines, Kissel, Diana	PSYC 1004 (MIN grade of P)
ABB	SOC 4714	Sociology of Mental Illness	Mental illness and social systems, historically and in contemporary society. Distribution of mental illness with special reference to stratification, role, and deviance theories. Mental health occupations and organization of treatment. Implications for social policy.	19671, 21264	Michael Hughes	SOC 1004 (Introductory Sociology)
C+I	ENGE 2094	Create!: Ideation & Innovation	Apply problem solving framing strategies as part of problem solving design processes. Consider cultural, economic, social, and other perspectives in customer discovery and design processes in order to ensure problem/solution fit. Ideate possible solutions or approaches to address open- ended problems using a variety of methods. Engage in iterative critiques of strategies, solutions and prototypes using methods drawn from industrial design, engineering and the arts. Collaborate in interdisciplinary and diverse project teams. Communicate deliverables in multiple formats and for different audiences. Identify and address impacts of designed services and products through global perspectives, such as patterns of inclusion and exclusion and effects on localized ecosystems.	14614, 14615	Chambers,	None
C+I	ENGE 4984 Special Study	Special Topics - The Arts, New Media, Creative Writing & Social Change (ADP: SS: Engineering Career Bridge)		21991	Paretti/ Cranwell	None
C+I	MUS 3314	Instrumental Ensemble Music	Instruction and participation in instrumental music performance ensembles under direction of members of the music faculty. Attention to technical proficiency, stylistic elements, musical design and interpretation in the works to be performed. Addresses ethical obligations and practice in a music ensemble setting. May be repeated for a combined maximum of 8 hours. L2Ork requires no audition or prior music training.	Following sections scheduled, but cancelled - 18295, 18287, 18288, 18304, 18285, 18286, 18305, 18298, 18283, 18297		None
C+I	MUS 4014	Topics Adv Electroacoustic Res	Rotating advanced research topics in electroacoustic music. Sonification, spatialization, algorithmic music, electronic music instrument design, digital performance ensembles, and advanced computer music composition. Repeatable with different content up to a maximum of 12 credit hours.	18309	Bukvic	MUS 3066 (Computer Music & Multimedia) and MUS 3164 (History of Electronic Music) (MIN grade of P for both)

C+I	STS 2254	Innovation in Context	Critical examination of diverse definitions and examples of innovation. Discussion of innovation as a process of social change; as technology diffusion; as an economic engine; as an ecosystem; as an ideology; and more. Introduction to methods and ideas from the field of Science and Technology Studies including the analysis of innovation from historical, cultural, and economic perspectives, as well as the study of innovation's consequences and its alternatives. Collaborative projects focused on creatively describing and critiquing local cases of innovative work.	19877	Winsnioski	None
DD	ACIS 1504	Introduction to Business Information Systems	Introduction to Business Information Systems with emphasis on the role of software applications as a tool to develop Business Intelligence to improve decision making. Design and development of spreadsheet and database solutions employing analytical techniques on large data sets to produce quality information. Ethical considerations of information management.	10104, 10105, 10106, 10107	Jsson Sharp	None
DD	BIT 3434	Advanced Modeling for Business Analytics	Study of selected, advanced topics in decision modeling and business analytics. Emphasis on model formulation, solution techniques, interpretation of results and comprehensive approaches to problem-solving. Integer, multi-criteria, and non-linear programming as well as network analysis and heuristics. Includes case studies and use of Excel as the primary analytical tool.	11770, 11771, 11772, 11773	Ragsdale, Cliff; Rakes, Zobel,	BIT 2406 (Bus Stats Analytics & Model)
C+I	BIT 4854	Analytics in Action	Problem-solving framework and analytic techniques for solving messy, unstructured, high-impact, real-world organizational/societal problems within an interdisciplinary, intercultural, experiential learning context. Definition of problem scope, objectives, need for change, ethical concerns, and diversity and inclusion issues; identification of stakeholders and their values; evaluation of decision tradeoffs; problem decomposition and hypothesis formulation; project planning and administration; data versus user requirements, ethical and inclusive decision making, data collection, preparation, and analysis; team roles and management; professional communication of insights, policy and action recommendations.	11798	Ragsdale, Cliff	CMDA 2014 (MIN grade of P) , BDS 2005 (MIN grade of P)
DD	CMDA 2014	Data Matter	This course develops fundamental analytical and programming skills to complete the “analytic pipeline”, including specifying research questions, selecting/collecting data ethically and responsibly, processing and summarizing datasets, and stating findings, while considering all assumptions made. Students will identify vulnerabilities in analyses, including sources of bias and ethical implications. Some programming skills recommended, but not required. Some prior use of data recommended, but not required.	12890	Datta	MATH 1014 (MIN grade of P)
DD IIHCC	CS 1014	Intro Computational Thinking	An exploration of basic ideas of computational thinking focusing on the perspectives, thought processes, and skills that underlie computational approaches to problem formulation and problem solving. Applications of computational tools to investigate complex, large-scale problems in a variety of knowledge domains. Basic introduction to algorithms and a practical programming language. Examination of the societal and ethical implications of computational systems.	13045, 13046	Kafura, Gautam	
DD	FREC 3004	Environmental Informatics	Applications of the analysis and modeling of large environmental datasets at multiple spatial-temporal scales to study environmental issues of societal importance. Acquisition, analysis, visualization, and storage of environmental data. Ethics and methods of data curation, quality control, and sharing. Sophomore standing required. Foundational knowledge in quantitative and computational thinking expected.	15468	Thomas, Quinn	(FREC 1044 (MIN grade of P) or CMDA 2014) (MIN grade of P)

DD	GEOS / GEOG 4354	Introduction to Remote Sensing	Theory and methods of remote sensing. Practical exercises in interpretation of aerial photography, satellite, radar and thermal infrared imagery. Digital analysis, image classification and evaluation. Applications in earth sciences, hydrology, plant sciences, and land use studies.	15748, 15749, 22233, 21821, 15653, 15654	Rijal,	None
DD IS	HIST/SOC/STS 2604	Intro to Data in Social Context	Examines the use of data to identify, reveal, explain, and interpret patterns of human behavior, identity, ethics, diversity, and interactions. Explores the historical trajectories of data to ask how societies have increasingly identified numerical measures as meaningful categories of knowledge, as well as the persistent challenges to assumptions about the universality of categories reducible to numerical measures.	16024, 16025, 16026, 19633, 19634, 19635, 19882, 19884, 19885	Davitt, Stamm	None
DD	STAT 3604	Statistics for the Social Science	Statistical methods for nominal, ordinal, and interval levels of measurement. Topics include descriptive statistics, elements of probability, discrete and continuous distributions, one and two sample tests, measures of association. Emphasis on comparison of methods and interpretations at different measurement levels. Includes real-world applications to develop problem-solving skills and ethical reasoning within the context of learning from data.	19777, 21051	Roberston Evia, Wycoff	MATH 1014 (Precalc with Transcendental)(MIN grade of P) or MATH 1025 (elementary Calculus) (MIN grade of P) or MATH 1225 (Calculus of a Single Variable) (MIN grade of P) or MATH 1524 (Business Calculus) (MIN grade of P) or MATH 1525 (Calculus with Matrices) (MIN grade of P)
ESM	CHEM 1016	Chemistry in Context	Survey of chemistry across areas of specialization for students enrolled in curricula other than science and engineering. History and fundamental concepts and theories of chemistry, including the consequences of changes in parameters on chemical systems. Impact of chemistry in the context of areas of public concern and policy, including best practices for sustainability, rational decision-making, ethical use of scientific information, product and process stewardship. Chemistry as a basis for decision-making in the context of individual values and beliefs, and the roles of values and beliefs in the progress of chemistry as a human endeavor. The foregoing to be based on the concepts of chemistry as follows: 1016: Chemical stoichiometry including conservation of matter and energy; acid-base and oxidation-reduction chemistry of solutions; stoichiometry and thermodynamics, agricultural and environmental chemistry, chemistry of household and personal care products	12458	Eddleton	None
ESM	CHEM 3054	Postconsumer Materials	Chemistry and global impacts of postconsumer materials including trash, biodegradable, recyclable, and reusable materials. Waste management of metals, ceramics, and polymers in the context of their chemical properties. Reliability and accuracy of information sources on postconsumer materials. Complex contemporary issues involving disposal and repurposing of postconsumer materials including health impacts, energy, cost, water quality, policy, return value, and environmental and cultural considerations.	12746	Bump	None
ESM	PHIL 1304	Morality and Justice	Morality and Justice (9 sessions); A critical survey of theories concerning human nature, the meaningful life, and the moral evaluation of actions, persons, and institutions. Theories will be applied to such issues as abortion, justice, and moral problems faced by professionals.	18729, 21168, 18730, 18726, 18723, 18728, 18727, 18724, 18725	MacKenzie, Horn, Novack, Yaure,	None

ESM	STS 2444	Global Science and Technology Policy	Introduction to issues and themes in global science and technology policy, from the perspective of Science and Technology Studies (STS). Comparison of national and international policy agents, institutions, structures, and processes. Integration of key ideas from STS into policy analysis, including regulatory cultures, cultural notions of risk and expertise, large socio-technical systems, and social shaping of technology. Emphasis on international controversies, diverse cultural perspectives, and inclusion in policy processes. Cases may include international controversies over genetically modified foods, transmissible illnesses, nuclear energy, and information security.	19878	Halfon	None
GSS	CSES 3134 (ENSC 3134)	Soils in the Landscape	A study of soils as functional landscape components, emphasizing their physical, chemical, mineralogical, and biological properties in relation to plant growth, nutrient availability, land-use management, and soil and water quality. Primarily for FOR/FIW, LAR, and other plant/earth science related majors. May not be taken by CSES or ENSC majors. Partially duplicates 3114 and 3124. Pre: one year of introductory CHEM or BIOL or GEOS.	13408, 13409, 13410, 13411, 13412, 14993 (ENSC 3134), 14994 (ENSC 3134), 14995 (ENSC 3134), 14996 (ENSC 3134), 14997 (ENSC 3134)	Steele	none
GSS	CSES 3444 (HORT 3444)	World Crops and Systems	An introduction to world crops, their primary regions of production, the factors that determine where they are grown, and their economic importance, and how they are used in the human diet. Describes the various factors that can be managed to improve crop yields. Examines present and potential systems of farming for improved crop production in the major climatic and soil ecosystems of the world. Provides an opportunity to taste foods made in traditional and non-traditional ways from the crops hence from field to fork.	13414, 13416, 16165 (HORT 3444), 16166 (HORT 3444)	Abaye	none
GSS	FIW 2114	Principles of Fish and Wildlife Conservation	Basic principles, key people, agencies and laws guiding the science-based conservation and management of fish and terrestrial animals. Conservation and management of organisms, habitats, and human users examined in terms of biological, physical, ecological, ethical and sociological theories and practices. Local to global illustration from both recreational and commercial resources.	15301	Hamed	none
GSS	FREC 2124	Forest, Society, and Climate	Role of forest ecosystems on the global carbon cycle, climate, biodiversity and economies. Anthropogenic impacts on forest ecosystems and their ecological function in the face of changing climate. Regional and cultural implications for the state of the forests and deforestation-related policy. Climate-related threats to global forests, including loss of biodiversity, deforestation, forest fires, and invasive species. Sustainable forest management for anticipated future scenarios.	15460	V Thomas	none
GSS	FST 2014	Introduction to Food Science	Fundamentals for food science and technology. Integration of basic principles of food safety, human nutrition, food spoilage, and sensory evaluation with the appropriate technology of food preservation and processing.	15580, 21427	Sean O'Keefe	none
GSS	FST 2044, IS 2044, PSCI 2044	Food, War and Conflict	Explores the history of food production and processing relative to the commencement or continuation of conflict. Examines why and how wars have been fought over economic policies, food trade and control of food supplies. Examines efforts to protect food and water supplies from intentional contamination and acts of terrorism. Focus on food products and the preservation, processing and distribution technologies that arose from war and conflict.	15581, 16327, 19275	Joe Eifert	none
GSS	GEOG/ NR 1116	Seeking Sustainability	Perceptions of, conditions of, and strategies to analyze processes of change within complex systems, and promote sustainability across local to global scales.	15620, 18472	Tim Baird	Reasoning in the Social Science intro course for Pathways 3 GEOG 1115 (MIN grade of P) or NR 1115 (MIN grade of P)

GSS	HNFE 2334	Intro to Integrative Health	Introduction to the principles of integrative health that promote health and well-being. Examination of the person- centered integrative health treatment methods including holistic stress management, the human spirit, communication, energy healing, elements of meditation, healing environments, Chinese medicine, Ayurvedic medicine, voice work, nutrition, therapeutic massage and bodywork, and healing effects of physical activity. Review of scientific evidence of integrative treatments.	16085, 16086	Young Ju	none
GSS	PHS 3014	Introduction to Environmental Health	Overview of environmental health, examining local, national, and international frameworks. Environmental factors that affect human health, including major classes of chemical, biological, and physical exposures from different environmental media (air, water, food, and soil). Special emphasis on toxicology and epidemiology methodologies used at the individual (mechanistic) level and at the population level to determine environmental causes of disease. Find the most appropriate prevention or control measure to minimize adverse health outcomes.	18796	Cohen	none
GSS	PHS 4054	Concepts in One Health	One Health refers to the dynamic interdependence of human, animal and environmental health and provides an important perspective in examining health problems. Theoretical foundations of One Health, methods for assessing animal- human linkages, policies and practices related to One Health and capacity building and public engagement. Junior Standing.	21126	Zambriski	none
GSS	PHS 4064	Modeling Infectious Disease	Mathematical modeling of infectious diseases; simple epidemic models, risk structure and modeling risk structure, multi-pathogen models, multi-host models, temporal seasonal models, spatial models, stochastic dynamics and modeling for public health policy. Pre: Junior Standing.	21138	Ruktanochai	none
GSS	PHS 5314 (VM 7314)	Infectious Disease Epidemiology	Dynamics and determinants of infectious diseases and their assessment on the molecular to population continuum in a systems based approach. Infectious disease transmission mechanisms; population susceptibilities; environmental, social, cultural and economic contributors to infectious disease propagation; detection and surveillance; geographic information systems; epidemiologic study design; and infectious disease modeling. Prerequisite: Graduate Standing required	18813, 20240	Zambriski	none
GSS	PHS 5704 (CEE 5704)	Drinking Water and Health	Drinking water contamination and associated health outcomes. Programs to improve safe water access. Viral, bacterial, protozoal, and helminthic pathogens. Heavy metals, pesticides, and other contaminants. Drinking water treatment and supply in rural areas. Study designs for health outcome assessment. Field-based intervention trials. Pre: Graduate standing.	21934, 21935	Cohen	none
IIHCC	ENGR 3124	Intro to Green Engineering	Introduction to green engineering and global environmental issues. Impacts of human and engineering activities on the environment, and techniques that can be utilized to minimize adverse environmental impacts with emphasis on environmentally conscious design and manufacturing.	14981	Jennifer Benning	Can request an exception: College-level math, physics, chemistry, and engineering concepts will be used throughout this course. Contact the instructor if you have any concerns about prerequisite knowledge. (CHEM 1035 or CHEM 1074, ENGE 1216 or ENGE 1104 or ENGE 1114, PHYS 2306)

IIHCC	NR 2554, LAR 2554, FREC 2554	Leading Global Sustainability	Leadership principles and humanities perspectives that help examine and engage global sustainable development challenges such as climate change, food-water-energy nexus, rising middle class, circular economy, and environmental justice. Topics include collaboration, stories, conflict resolution, self-awareness, bias, equity, religion, hubris, globalism, and moral naturalism. Examine trade-offs among economic, environmental, and social dimensions of sustainable development. Integration and application of disciplinary topics including ethics, ecology, evolution, anthropology, economics, religion, aesthetics, and risk management.	18473, 16671, 15465	Robert B. Hull	None
IIHCC	PHIL 3334	Ethics & Artificial Intelligence	Critical examination of ethical concepts and theories, such as utilitarianism, deontology and virtue theory, applied to issues that arise in artificial intelligence, including applications in smart design & construction, energy, ubiquitous mobility, and robotics & autonomous systems. Addresses questions such as: How much should privacy be protected in the digital future? How can energy be equitably transported and consumed in relation to poor regions and future generations? Who should autonomous vehicles be programmed to protect or sacrifice in emergency situations? How should we evaluate the effects on family and society of smart technology? Should we fear that robots will take over?	Section of course not scheduled for Spring 2021		None
IIHCC	STS 2254	Innovation in Context	Critical examination of diverse definitions and examples of innovation. Discussion of innovation as a process of social change; as technology diffusion; as an economic engine; as an ecosystem; as an ideology; and more. Introduction to methods and ideas from the field of Science and Technology Studies including the analysis of innovation from historical, cultural, and economic perspectives, as well as the study of innovation's consequences and its alternatives. Collaborative projects focused on creatively describing and critiquing local cases of innovative work	19877	Mathew Wisnioski	None
IIHCC, ESM	MSE 1014	Material Science in Everyday Life	Introduction to the science of materials using everyday applications in modern society from medicine, transportation, sports, art, music, infrastructure, and electronics. Discussion of metals, ceramics, plastics, biomaterials, and hybrid materials based on the fundamental science dictating their structure properties, and processing. Considerations of tradeoffs between environmental sustainability, ethical and societal issues, and economics for materials choices.	18099	Sean McGinnis	None
IIHCC, GSS,DD	GEOG 1084, FREC 1004	Digital Planet	Exploration of innovative geospatial technologies and their impact on the world around us, including how humans interact with the environment and each other. Roles of location-based services, global positioning systems, geographic information systems, remote sensing, virtual globes and web based mapping for environmental applications. Skills and techniques for spatial thinking and environmental decision-making. Ethical implications of the use of geospatial technologies, data, and computational approaches	15618, 15457	Gannon, John P	None
IS	BIT 4624	Cybersecurity Analytics	Application of advanced analytics to cybersecurity in a business setting. Categorization of cyber threats and solutions. Data mining, visualization and machine learning applied to large data sets for anomaly detection, threat prediction, and incident response analysis. Investigation of adversarial machine learning. Selection of appropriate analytics techniques and security platforms. Consideration of business and ethical issues.	11797	Adjerid	BIT 4614 (MIN grade of P) or CS 4264 (MIN grade of P)

IS	BIT 5114	Crime and Conflict in Cyberspace	In-depth exploration of the cyber threat landscape and the motives, methods, and mechanisms that shape it. Complex and evolving nature of security, privacy, policies and safety in cyberspace. Consequences posed by cyber threats at the individual, corporate, national, and societal levels. Cyber threat research, governance and analysis. National and international policies and strategies for protecting cyberspace.	11804	Baker	none
IS	BIT/CS/PSCI 2164	Foundations of Contemporary Security Environments	Introduction to multiple analytical perspectives on contemporary security environments, including political, legal, ethical, technical, environmental and historical and cultural perspectives relative to the conception, design and implementation of security solutions, practices, and policies. Emphasizes applying and analyzing the effectiveness of diverse procedures, tools and policies used in security and privacy solutions, decision-making, risk management and operational policy to mitigate local, national, international and global threats.	11747, 21496, 19281, 21495	Clara Suong	None
IS	BIT/CS/PSCI 4164	Future of Security	Identification and analysis of complex, real-world security problems and threats to people, organizations, and nations across multiple domains, roles and future scenarios. Crisis communication, decision making tools, ethical principles and problem-solving methods to respond, assess options, plan, scope, and communicate before, during and after conflicts, disasters and attacks. Use of an experiential learning facility, and participation in a reality-based team simulation of cascading security and disaster events.	21604, 21603, 21820	Aaron Brantly	IS Gateway Minor course
IS	CS 1054	Introduction to Programming in Java	This course provides an introduction to object oriented programming using the Java language. Fundamental concepts underlying programming and software solutions to many problems. Structured data, statement sequencing, logic control, classes, objects, methods, instantiation of classes, sending messages to objects.	13052, 13050, 20434, 13048, 13049, 13051	Mohammed Farghally,	None
IS	CS 1064	Intro to Programming in Python	Developing computational problem solving skills and software solutions to a variety of multimedia, scientific, and engineering problems using the Python programming language. Statement sequencing, conditional program flow, iteration, functional decomposition, and recursion. Simple numeric data types, strings, lists, list comprehensions, sets, and dictionaries. Input/output of file-based data, content obtained from the web, and manipulation of digital images. Basic object-oriented concepts, classes, objects, and methods.	13053, 13054	Lewis, John A	None
IS	CS 1114	Intro to Software Design	Fundamental concepts of programming from an object-oriented perspective. Basic software engineering principles and programming skills in a programming language that supports the object-oriented paradigm. Simple data types, control structures, array and string data structures, basic algorithms, testing and debugging. A basic model of the computer as an abstract machine. Modeling and problem-solving skills applicable to programming at this level. Partially duplicates 1054, 1124, and 1705.	13057, 13055, 13061, 13064, 20455, 13065, 13071	Barnette, Noah D, Annette Feng	None
IS	FIN 4014	Cyberlaw and Policy	Cyber law, ethics, and policy in a changing world. National and international methods of regulation and protection of fundamental rights. Legal, ethical, and policy issues for Internet governance, speech, privacy, cybersecurity, surveillance, electronic commerce, intellectual property, and "cyberwar." Examination of current issues and texts in light of fundamental ethical and legal principles and global discourse. Pre: Junior standing.	15243	Price, Audra	None

IS	GEOG 2054 / IS 2054 / PSCI 2054	Introduction to World Politics	An introduction to the prevalent methods and theories in the study of world politics. Topics include: historical context of contemporary world politics, global actors and power relations, conflict and conflict resolution, international law, and contemporary global issues.	21494, 15625, 21186, 15626, 21493, 16328, 21185, 16329, 21492, 19277, 21184, 19276	Courtney Thomas, Molly Todd, Desiree Poets,	None
IS	GEOG 3104	Environmental Problems	Environmental problems in their social, spatial, and global contexts. Impacts of globalization, neoliberalism, and population growth on the environment. Examination of effects of developed and developing countries on the environment. Focus on conceptualizing development, population dynamics, environmental justice, factory farming, energy and renewable energy, global health, disasters, and intercultural and global awareness.	15638	Juran, Luke	None
IS	PSCI 3054 / IS 3054	The Dark Web and Threat Analytics	Introduction to dual-use anonymity-granting technologies such as the Dark Web. Covers open source threat intelligence as a technique to assess trends and trajectories in anonymous online content. Substantive topics include the use of Dark Web technologies for political expression in repressive regimes, anonymity and privacy protection in an age of big data as well as the misuse of these tools for doxing, trolling, and the creation of illegal markets for drugs, guns, malicious software, human trafficking, and child abuse imagery.	19291, 16338	Jardine, Eric H.	Junior Standing
IS	PSCI 3104 (IS 3104)	Security Stud: Theor & Concpts	Introduces the various theoretical approaches to security. Examines key concepts in the field of Security Studies, such as uncertainty, polarity, war, coercion, terrorism, intelligence, genocide, crimes against humanity, ethnic conflict, and human security.	19294, 19293, 16341, 16340	Samuel Beckenhauer, Sengul Yildiz Alanbay	IS 2054 (Introduction to World Politics) (MIN grade of P) or PSCI 2054 (Introduction to World Politics) ((MIN grade of P) or GEOG 2054 (Introduction to World Politics) (MIN grade of P)
IS	PSCI 3114 (IS 3114)	Global Security	Explores various theoretical approaches to security and discusses traditional and non-traditional security issues. Focuses on global, international and regional security challenges and examines alternative strategic and tactical solutions for addressing them.	19295, 16342	Nada Berrada	IS 2054 (Introduction to World Politics)(MIN grade of P) or PSCI 2054 (Introduction to World Politics) (MIN grade of P) or GEOG 2054 (MIN grade of P)
IS	PSCI 3184 (IS 3184)	Human Security	Introduces the field of human security and examines the conceptual, theoretical and methodological issues surrounding it. Identifies the relevant human security actors, explores the tools of human security, and discusses the application of human security. Investigates the implications of human security and discusses its future.	19302, 16349	Apodaca, Clair	IS 2054 (Introduction to World Politics)(MIN grade of P) or PSCI 2054 (Introduction to World Politics) (MIN grade of P) or GEOG 2054 (MIN grade of P)
IS	PSCI 3704 (IS 3704)	National Security Strategy	Focuses on the causes of war and the conditions of peace. Examines the logic, levels, and outcomes of strategy and investigates the impact of international law and politics on the use of force. Explores contemporary strategic theory and discusses current issues in grand strategy.	19324, 16357	Stivachitis	IS 2054 (MIN grade of P) or PSCI 2054 (MIN grade of P) or GEOG 2054 (MIN grade of P)
IS	PSCI 3734 (IS 3734)	National Security	Post-1945 strategic problems, policies, and security commitments of major participants in international politics, especially the United States and Russia; effects of security policies on international and domestic political economies.	21047, 19325, 21048, 16358	Chris Price, Arnold Dupuy	PSCI 2054 (MIN grade of P) or IS 2054 (MIN grade of P) or GEOG 2054 (MIN grade of P)
IS	PSCI 4024 (IS 4024)	Seminar Diplomacy & Security	In-depth analysis of selected topics in diplomacy, strategy, and national security including issues pertaining to international conflict and cooperation; dimensions of national power; objectives of national policy and implementation of national strategy; diplomatic negotiations; and conflict resolution.	21502, 19329, 21503, 16363	Audrey Reeves, Ionnis Stivachtis	IS 2054 (Introduction to World Politics) (MIN grade of P) or PSCI 2054 (MIN grade of P) or GEOG 2054 (MIN grade of P) Senior Standing

IS	PSCI 4074 (IS 4074)	The Politics of Cybersecurity	Analyses the politics of cybercrime, cyberwar, and the challenges of producing effective cybersecurity. Topics include the economics of cybersecurity, the cross-border nature of global cybercrime, encryption and anonymity-granting technologies, targeting critical national infrastructure, network investigative techniques, cybersecurity measurement, politics of zero-day vulnerabilities, and the process of providing effective cybersecurity at the individual, organizational, subnational, and national levels.	21507, 21508	Jardine, Eric H.	PSCI 3044 (MIN grade of P) or IS 3044 (MIN grade of P)
IS	PSCI 5254 (GIA 5254)	Global Conflicts	Examines theoretical issues in the study of global conflicts. Reviews theories of nationalism, states and territory as factors. Examines dynamics of contemporary conflicts from different regions of globe as case studies illustrating theoretical issues. Reviews role of leaders in conflict processes. Graduate Standing.	19351, 15816	Gerard Toal	none
IS	PSCI 5484 (HIST 5484 / GIA 5484)	Contemporary American Foreign Policy	Covers U.S. foreign policy during the Cold War, the stalemate with the Soviet Union, armament and arms control, containment and deterrence, detente and Reaganism, and the end of the Cold War. Briefly covers events from 1989 to the present. Designed for students with an interest in foreign policy and global affairs. Prereqs or instructors permission.	21216, 21218, 21217	Dupuy	PSCI 5214, PSCI 5444
IS	PSCI 5614 (GIA 5614 / HIST 5544)	Israeli Palestinian Conflict	Dynamics of the Israeli-Palestinian conflict. Critical issues that underlie the conflict and divide Israel and the Palestinians. Diplomatic efforts aimed at resolving the conflict. Pre: Graduate Standing.	21684, 21681, 21682	Peters	none
IS	PSCI 6254	National Security	Application of security analysis tools to national security issues. Domestic and international security contexts, actors, and processes. Contemporary challenges to national security such as cyber-threats, terrorism, proliferation of weapons of mass destruction, pandemics and environmental threats, organized crime, drug and human trafficking, state failure and state- building, and migration.	21213	Avey	GRAD 5104 (MIN grade of P) , PSCI 5116 (MIN grade of P) , PSCI 5214 (MIN grade of P) , (PSCI 5464 (MIN grade of P) or ASPT 5464) (MIN grade of P)
IS	BIT 4614	Information Security	Study of policies, procedures, and technologies for enhancing the security of information. Topics include physical security, communications security, emissions security, computer security, and network security. The core security goals of confidentiality, integrity, and availability are emphasized throughout the course.	11796	Tabitha L James	BIT 3424 (Intro Bus Analytics Modeling) (MIN grade of P) or BIT 2164 (Foundations Security Environ) (MIN grade of P) or CS 2164 (Foundations Security Environ) (MIN grade of P) or PSCI 2164 (Foundations Security Environ)(MIN grade of P)
GSS	GEOS 1014	Evolution of Earth- Life System	Introduction to the interaction of the Earths processes that shape our planet and its biosphere through time. Application of modern geoscientific inquiry; biological, chemical and physical interactions that are part of the Earth system; distribution of life on Earth (i.e., biogeography); diversity of life over time; the differentiation between science and pseudoscience; ethical issues around human activities and their impact on the Earth-Life system.	15705	Xiao	None
GSS IIHCC	GEOS 1024, GEOG 1024	Earth Resources, Society & Environment	Introduction to the Earths resources including their nature, formation, occurrence, extraction, distribution, consumption, and waste management and disposal using an integrated cradle to grave analysis. Population, the Earths metallic and non-metallic resources, rare earth elements, non-renewable and renewable energy and water. Social, environmental, economic and political impacts resource production and consumption have had historically, currently, and that are predicted into the future including current and future sources of energy in the United States and internationally	Sections of GEOG 1024 course not scheduled for Spring 15706, 15707, 15708	Chermak, Sublett	none

GSS	GEOS 1034	Earths Natural Hazards	Fundamentals of Earth processes that drive natural hazards, including earthquakes, volcanoes, tsunamis, hurricanes, tornadoes, floods, climate change and impacts with space objects; impacts of human activities on the Earth; defining and analyzing hazards and risks through testing hypotheses on geologic data; ethical issues arising from hazard mitigation; analysis of uncertainties of scientific information.	15709, 15710, 15711	N. E. Johnson, D. S. Stamps, Y. Zhou	none
GSS	BIOL 1054	Human Biology: Concepts and Current Issues	Survey of human biology, including physiology, genetics, evolution, and ecology. Focus on homeostasis, including factors and choices that disrupt homeostasis and health. Examination of technological advances and ethical issues associated with the biology of humans. Personal and societal choices that impact human ecology.	21046	EP Hogan	none
Policy	Phil / Econ/ PSCI 2894	Introduction to Philisiphy, Pols, and Economics	Integrated study of philosophy, politics, and economics. Trains students to make decisions that are not only economically sound, but also socially, ethically, and politically informed. Topics include: models of human nature, rational choice theory, social cooperation, distributive justice, markets, and democracy.	18750, 18751, 19282, 19283, 14270, 14271	Michael Meohler, Gil Hersch	sophomore standing
Policy	PHS 4044	Public Health Policy and Administration	Evolution and analysis of public health policy in the United States. Public health and care systems. Administrative concepts central to public health such as human resources, strategic planning, controlling, directing, leadership and health law. Junior Standing.	18801	Deagle	Junior standing
Policy	PHS 5014 (VM 7014)	Environmental Health	Exploration of major environmental health concepts and issues, environmental policies and regulations. Topics include world population and pressures on the environment, healthy environment; environmental determinants of public health, including biological, physical and chemical factors; environmental factors affecting disease vectors and their control; air and water quality; waste management; the built environment, work environments and recreational area; food protection and safety; occupational health; tools for environmental evaluation, planning and safety. Pre: Graduate Standing or permission from the instructor.	18808, 21156, 21598, 20239	Gohlke, Calder / Calder, Julia	none
Policy	SPIA 4464	Data and the Art of Policy Making and Planning-	Critical examination of use of scientific and technical information in planning and policy-making, exploring issues and challenges through social science lens. Investigation of appropriate and responsible use of data within collaborative and deliberative policy-making and planning processes. Presentation of data and underlying models in accessible and understandable formats. Integrating all forms of knowledge into decision-making, including local and traditional knowledge.	19754	Lim	None
Policy	SPIA 5124 (PSCI 5124, STS 5124)	Decision Making, Reflective Practice, and Engagement in STEM-H Domains	In-depth case-based exploration of roles of science, technology, engineering, and mathematics in policy-making. Application of theories, concepts and practices for policy decision-making, including stakeholder engagement, human behavior, and organizational development. Critical examination of ethics, and fostering of reflective practice. Implications of big data and modeling in decision-making. Pre: Graduate standing.	21289, 21979, 21293, 21292	Shchenk	None
Policy	UAP 1024	Urban Public Issues	This class introduces some of the most vital concerns and issues challenging democratic capitalistic urban societies today. Topics addressed include different perspectives on the causes and portent of the urban underclass, the growing inequality between the educated and less well educated in the nations labor markets, the causes of the marked resegregation of many of the nations urban centers by race and income and the implications of privatization and interjurisdictional competition for the public policy behavior and outcomes of subnational governments.	20094	Stephanie Davis	

GSS	PHS 5984 Special Study	SS: Ethical Foundation of Public Health	The goal of this course is to introduce public health students to the ethical foundations of public health practice. Consistent with the Association of Schools and Programs of Public Health (ASPPH) model public health ethics curriculum, this course is designed to stimulate students' moral imagination, improve the ability to recognize ethical issues in public health practice and research, elicit a sense of ethical responsibility, and develop skills for managing ethical ambiguity. By the end of the course, students will be able to describe the difference between and implications of the distinctions and overlaps between professional ethics, research ethics, clinical ethics, and public health ethics; summarize key historical events in public health that led to ethical concerns; evaluate and apply decision-making frameworks to analyze public health ethical challenges; access public health ethics literature from applicable journals; and communicate orally and in writing a clear and well-reasoned argument for a course of action to address public health ethics dilemmas.	21709	Lisa Lee, Pamela Teaster	none
C+I	MGT 4094 (IDS 4094) (ENGE 4094)	Start Up: Commercialization	Work in interdisciplinary teams in an experiential environment replicating modern innovation environments. Engage in real world innovation commercialization opportunities. Individual experiences and projects involving actual inventions, innovations, technologies, intellectual property (e.g. patents) and market opportunities. Integrate design thinking, scientists, entrepreneurs, advisors and other potential collaborators. Create a representation of a plan for a minimum viable product for an innovative product or service based on customer and market feedback.	17878, 16303, 14618	David Gray	None
C+I	STS 6614	Advanced Topics in Technolgies Studies	Variable topics in technology studies, including development and structure of knowledge in technology and engineering, social construction of technology, knowledge and power in technology, gender and technology, engineering in society, human/nonhuman relations in technology. May be repeated with a different topic for a maximum of 6 credits	19915	Matt Wisinoski	None
C+I	MUS 3064	Digital Sound Manipulation	Study of recording technology and its effects on music. Aesthetics of electronic music. Recording and editing digital sound. Visual programming for live sound synthesis and processing. Acoustic compilers for programmatic sound processing and synthesis. Individual creative applications of tools learned in class. Team-based work on creative projects.	20880	Eric Lyon	None
C+I	STS 5614 (PAPA 5614)	Introduction to Science and Technology Policy	Strategies for science and technology policy; science education; scientific and technical information for societal uses; government and public policy; resource allocation; economy and global exchanges of science and technology; approaches to policy evaluation.	20509, 22230	Halfon	None
~~C+I~~	~~CAUS 4984 Special Study~~ This is not an active CAUS course	~~Capstone Course (Special Study)~~	~~Analyzes the interactive relationships between place, space, identity, and community in the United States and beyond. Engages in transdisciplinary collaboration through reflective teamwork. Synthesizes multiple, complex sources and creates coherent arguments.~~	~~Section of course not scheduled.~~		~~None~~
C+I	MUS 3066	Computer Music and Multimedia I	A two-semester study of interactive multimedia composition and performance software as a foundation for creative work and research endeavors. Also provides an in-depth study of digital sound synthesis, algorithmic creation of multimedia content, and the design of audio-visual interactive systems using latest technologies. Must meet pre-requisite or have permission of the instructor	18274	Charles Nichols	None

ABB	PSYC 3014	Abnormal Psyc	Survey of various types of psychological disorders and of contrasting theoretical views and representative research on the etiology and prognosis of these disorders. Using the Diagnostic and Statistical Manual (DSM-5) to diagnose psychopathologies accurately. Ethical issues pertaining to clinical practice.	19398, 19399, 19400, 19401, 20982	Richey, Albright, Antezana, McFayden, Jones	Pre: 1004
ABB	NEUR 4034	Diseases of the Nervous System	Common brain and Central Nervous System (CNS) disorders ranging from trauma to autism. Genetic, molecules and cellular changes in disease. Therapeutic implications and development of novel drugs. Challenges in drug discovery and implementation of personalized medicine. Ethical issues regarding genetic findings.	18426	Kimbrough	Pre: 2026, 3044