

Heinz College of Information Systems and Public Policy Courses

While Heinz College currently offers no undergraduate degree programs, several of its courses are open to undergraduates, though special permission is required for some courses.

About Course Numbers:

Each Carnegie Mellon course number begins with a two-digit prefix that designates the department offering the course (i.e., 76-xxx courses are offered by the Department of English). Although each department maintains its own course numbering practices, typically, the first digit after the prefix indicates the class level: xx-1xx courses are freshmen-level, xx-2xx courses are sophomore level, etc. Depending on the department, xx-6xx courses may be either undergraduate senior-level or graduate-level, and xx-7xx courses and higher are graduate-level. Consult the Schedule of Classes (<https://enr-apps.as.cmu.edu/open/SOC/SOCServlet>) each semester for course offerings and for any necessary pre-requisites or co-requisites.

Heinz College-Wide Courses

94-216 Introduction to Decision Analytics and Systems

Intermittent: 6 units

This course introduces students to the analytics toolkit (data systems, Operations Research, Machine Learning, Statistics, and causal inference) and what it takes to use formulate problems, scope them and understand how to intervene to support decision making to achieve policy objectives. In short, it introduces you to the art and science of translating analytics into action using "curated examples" and case studies from the real world. These case studies will introduce you to key elements of the data-driven and model-based approaches to decision-making. The approaches you will be exposed to in this course find wide application. Examples include the creation of transportation systems (bus, on-demand rideshare, bike share) to equitably serve all neighborhoods, the responsible use of AI in systems to hire people for positions, and optimally delivering covid vaccine boosters to disadvantaged and hard to reach populations.

94-217 Systems Thinking and Discrete Event Simulation

Intermittent: 6 units

We are surrounded by complex systems with interrelated components. In this course, we will introduce two components of system analysis and modeling: Systems Thinking and Discrete Event Simulation. In the first part of the course, Systems Thinking, you will learn how to approach complex systems, identify their components, and understand the interactions and their impact on the system. In the second part of the class, you will learn practical skills by using Discrete Event Simulation to model and analyze real-world systems. At the end of the course, you will be able to understand and approach problems from a systems perspective and propose effective policies to improve the performance of the system. The course will be divided into two main units: Systems Thinking and Discrete Event Simulation. The class will be a combination of lectures and in-class activities to support your learning process. You will also work on a course-long project on a topic of interest where you will apply the concepts learned.

94-401 Acting for Leadership and Communication

Fall and Spring: 6 units

Actors use "tools" (voice, body, focus, intention, self-reflection, empathy) to convey emotion and connect authentically audiences. Acting for Management will help you utilize the actor's tools to become a more powerful and persuasive leader, to feel more confident when communicating with others, to understand yourself and your audience and to show the world the best and most authentic version of you. Through in-class exercises, scene work and discussion, you will practice the art of self-reflection and the craft of acting so you can learn how to enhance your abilities as a well-rounded and insightful person, an outstanding manager and an inspirational leader.

94-402 Geographic Information Systems

Fall and Spring: 12 units

A geographic information system (GIS) provides storage, retrieval, and visualization of geographically referenced data as well as design and analysis of spatial information. GIS provides unique analytical tools to investigate spatial relationships, patterns, and processes of cultural, biological, demographic, economic, social, environmental, health care, criminal, and other phenomena. The course includes lectures, computer labs, and a project using the leading desktop GIS software, ArcGIS Pro, from Esri, Inc. Subject areas will include: - Geographic concepts (world coordinate systems, map scale/projections, sea level/elevation), - Government-provided map infrastructure (TIGER maps, census data, satellite and aerial photo images, local government cadastral maps), - Map design (cartography, interactive maps, map animations, and Web-based GIS), - Geodatabases (importing spatial and attribute data, geocodes, table joins, data aggregation, and map queries), - Creation of new spatial data (digitizing, geocoding, and dissolving vector features), - Spatial data processing (clipping, merging, appending, joining, dissolving), - Spatial analysis (proximity analysis, risk surface, site suitability, spatial data mining), - Other topics (raster GIS, 3D GIS, network analysis, etc.) as identified in course materials and selected the instructor.

94-403 Consulting Lab

Intermittent: 6 units

Communication is the glue that holds consulting engagements, teams, and relationships together. Arguably, the better a consultant you are, the better a communicator you are, and the best communicators tend to make very good consultants (nice symmetry there). Poor communication and other 'soft skills' can derail a consulting engagement and with it, a promising consulting career. As an example, a Gartner Group study found that 80% of all IT projects were late, over budget, or failed completely because of poor communication at the outset. This course will help students interested in a consulting career acquire new skills in everything from personal branding to asking high-value, incisive questions to building strong, long-term client relationships.

94-408 Management Consulting

Intermittent: 12 units

This course is for undergraduate students in their third year or later. Graduate students should enroll in 94-808. This is an applications course exploring the profession of management consulting and the art and science of providing management counsel to organizations in the public and private sectors. The course is designed to provide a framework for collaborating with organizations to solve problems and to execute projects efficiently and effectively. Students will explore and utilize practical tools that will enable them to solve problems and execute projects as external or internal consultants or as individual contributors or leaders within organizations. The course introduces frameworks as well as quantitative and qualitative methods that are typically used in management consulting.

94-409 Healthcare Information Systems

Spring: 12 units

In a value-based care delivery environment with its emphasis on improving costs and service efficiency without risking quality of care, information technology has emerged as a powerful driving force in helping to achieve multiple goals within healthcare organizations. The explosive advances in information technology combined with the current challenges facing healthcare delivery have created the need for skilled individuals who can develop, understand, manage, and integrate healthcare information systems in organizations. This course will explore the concepts and application of major information systems methodologies and approaches in the delivery of modern healthcare systems, including traditional face-to-face, online, and mobile and social media enabled care delivery. A semester-long group project that synthesizes the different topics via the design and implementation of a working, integrated, healthcare decision support application will be a required component of the course.

Prerequisites: 36-200 and 90-436 and 67-262

94-413 Project Management

Fall and Spring: 6 units

As organizations continue to look for ways to reduce costs, managers are often expected to oversee special projects in addition to their traditional responsibilities. When a project is too complex for one person to handle, the project manager is expected to lead a team of diverse employees to complete the assignment. This course will assist the project manager to break down a complex project into manageable segments, lead a diverse project team, and use effective tools to ensure that the project meets its deliverables and is completed within budget and on schedule. Over the course of the mini, students will complete a plan for an actual project, giving them valuable experience with the relevant tools and skills, including Microsoft Project software.

94-423 Measuring Social

Fall and Spring: 12 units

Measuring Social is an experiential learning class for graduate students across Carnegie Mellon. We bring in 5-7 corporate sponsors each semester (Spring and Fall) and they develop a project for the student teams to work on over the semester. Each project involves an element of measuring unstructured social data as well as providing recommendations based on its analysis. The class has been running since 2010 and we have done over 120 projects in the class for close to 100 different unique clients including Marriott, Google, Warner Bros., Sony PlayStation, Nike, Target, Ford, NYTimes, The Lincoln Center, American Express, The Gap, NBCUniversal, Microsoft, etc. We welcome graduate students from across CMU including Data Analytics, Public Policy, Entertainment and Arts Management, Business/Tepper, CS/HCI, ECE, English and Design. We socially engineer teams to add as much diversity as possible. Projects in the class vary from internal social network analysis to external client and community engagement tactics through analyzing social data from thematic strings, sentiment analysis, community segments etc. As an example, a team working with Marriott used ML models to understand and present benefit with deploying social influencers across different categories associated with brand recognition for their W hotel properties. Students teams have access to commercially available off the shelf software tools for social listening and social intelligence and we provide in class training. Students have reported many benefits associated with participating in the class including: Opportunity to work with students from across CMU with different experience/viewpoints, Engaging in a real world consultative project with a brand name company, Development of non-cognitive skills associated with problem solving, An opportunity to develop and present recommendations/data models that in many cases get implemented by sponsoring organizations.

94-431 Applied Econometrics I

Intermittent: 6 units

Econometrics has an important place in the data sciences. As your textbook authors say, the purpose of econometrics is to "untangle cause and effect in human affairs." Econometrics is essential for advancing understanding in the social sciences, conducting public policy evaluation, and assessing the impact of business practice. Both Applied Econometrics I and Applied Econometrics II are "hands on" courses in which you will not only learn to read and interpret existing studies, but will also conduct econometric analyses of your own. The goal is to help you take your first few steps toward becoming a "Metrics Master"! One of those steps is becoming competent and confident in the use of Stata to conduct empirical analyses. Pre-requisites: Applied Econometrics I: Students are presumed to have a solid grounding in basic statistics, at the level of 90-711 (Empirical Methods for Public Policy and Management), 90-786 (Intermediate Empirical Methods) or 95-796 (Statistics for IT Managers). We will make good use of the material covered in those courses.

94-443 Arts Management and Technology Lab

Fall and Spring: 6 units

94443 is a cross listing associated with 94843. Only undergraduates in year 3 or higher will be registered into 94443. Graduate students should register for 94843. Centering work at the intersections of arts, management and technology, this course is designed in a 'studio lab model' in which students gain an understanding of how to conduct professional - level research with a focus on how technology is shaping arts and entertainment enterprises across the globe. Students simultaneously learn and experiment with how to share that knowledge using multi-modal, trans-media digital storytelling methods. Research findings are intended for publication on the Arts Management and Technology research platform, curated by a student-managed team to serve professionals working in the field. This class is designed to provide a breadth of skills that will serve emerging professionals in the fields of research, communication, or institutional development. With a focus on digital modes of communication aka content creation, young professionals leave the course with effective skills to communicate ideas to peers, supervisors, or customers. Furthermore, current and future leaders need to understand how to evaluate or conduct research emerging opportunities in order to make effective decisions. Adopting a studio model, students will spend time prior to class meetings gaining an understanding of theories and approaches to research and digital communication. In class, students will work actively to synthesize the theories and put them into practice, from creating an evidenced based infographic to scripting and recording a podcast episode. Each student will work on a semester long, independent, research project at the intersection of arts management and technology. A list of potential, but not prescribed research topics are provided at the beginning of the semester and all assignments scaffold from inception to final product.

94-454 Developing as a Leader

Fall and Spring: 6 units

This course introduces students to leadership via three learning frameworks: models, practice and reflection. Using guest lectures, readings and videos, and small group discussions, we will define leadership and provide applicable frameworks for leadership practice. Students will be able to experiment and practice different skills and styles in a safe environment where they can receive useful feedback. To help students pursue their own personal path of leadership development, the focus is on formulating personal goals, models and activities that sustain this development over the course of their careers.

94-470 Telling Stories with Data

Intermittent: 6 units

Data visualization is the art of understanding how humans understand our visual environment and of applying that knowledge to the visual representation of information. The ability to effectively tell a story through data can be the difference for an initiative being successful, research being remembered, or a story that leads to action. Part art, part science, visualizing data is a process that is both well established in some disciplines while also rapidly changing and evolving in others. Students will learn to critique and create data visualizations using different methods. Students will explore various aspects to visualization as we deconstruct and reconstruct visualizations, learning how others use different approaches to communicate effectively. We'll dig into data in different ways to help our readers understand complex issues, and finally experiment with new ways to represent data about our work, our community, and ourselves. Students will get hands-on training and experimentation with a number of tools, and have some flexibility to concentrate on mediums that best match their desired outcomes and skills for a final project (print, digital, interactive or immersive).

94-483 Applied Ethical Analysis

Intermittent: 6 units

This course provides a framework to increase accountability through ethical decision-making. The goal of this course is to allow you to understand the complexity and consequences of decisions, the utility of ethics in personal and professional life, and the motivations of others (be they ethical or not). You will gain the ability to recognize and address underlying principles in a variety of contextual dilemmas. Students will learn to practically apply established theory and methodology to create and sustain trustworthiness. Case studies, small group discussions, scholarly readings, and videos will demonstrate the relevance and importance of applied ethics.

94-491 Lean Innovation Lab

Intermittent: 12 units

Lean Innovation Lab is a specialized Heinz College course that is designed to challenge students to tackle new and emerging problems through mission-driven entrepreneurship. Students will be placed in teams (of 4-7) and select from a set of carefully curated, complex, and real-world problem sets. Student teams will learn about the problem sponsors as an organization, their culture, and their mission to instill a culture of relentless resilience and new innovative practice. Individuals will learn to apply Lean Innovation frameworks and tools to identify key stakeholders, understand their needs, and develop and test iterative minimum viable products (MVPs) that lead to an applicable solution. Using a flipped-classroom approach, the teams brief the teaching team on their progress each week and receive direct coaching from their instructors and advisors, mentors, and subject matter experts from across public and private entrepreneurship ecosystems. Problem sets will focus on solving problems across public agencies in government as well as dual-use applications in private sectors and industries.

94-700 Organizational Design & Implementation

Fall: 6 units

This course draws on insights and knowledge about organizational behavior with an eye toward using such information for managing in complex organizations. It is intended to provide managers with skills and perspectives that will enable them to work successfully in organizations. Specific topics will include work motivation leadership job design biases in managerial decision making understanding group processes building bases of power in organizations managing conflict and the relationship between the organization and its environment.

Course Website: <https://www.heinz.cmu.edu/current-students/courses/94-700>

94-705 Health Economics

Spring: 12 units

Can the tools of economic analysis be applied to health care? What about health care, if anything, makes it different than other goods? The purpose of this course is to introduce the student to the methods of health economics and demonstrate how these methods can be applied to analyze issues in health policy and management. This course will teach the student to use economic analysis to understand critical issues in health care and health policy.

Course Website: https://api.heinz.cmu.edu/courses_api/course_detail/94-705

94-706 Healthcare Information Systems

Spring: 12 units

In a value-based care delivery environment with its emphasis on improving costs and service efficiency without risking quality of care, information technology has emerged as a powerful driving force in helping to achieve multiple goals within healthcare organizations. The explosive advances in information technology combined with the current challenges facing healthcare delivery have created the need for skilled individuals who can develop, understand, manage, and integrate healthcare information systems in organizations. This course will explore the concepts and application of major information systems methodologies and approaches in the delivery of modern healthcare systems, including traditional face-to-face, online, and mobile and social media enabled care delivery. A semester-long group project that synthesizes the different topics via the design and implementation of a working, integrated, healthcare decision support application will be a required component of the course.

School of Information Systems & Management Courses**95-401 IdeaLab**

Intermittent: 3 units

We all have ideas; ideas are rarely the problem. The problem whether you have an entrepreneurial idea, a policy idea, a process idea, a product idea, even an academic idea isn't how to have the idea, but how to advance the idea. And for this, design thinking and creative thinking tools and techniques can help. IdeaLab is a micro-course and laboratory that helps students learn the tools and techniques that will help them advance their ideas whatever they are to a point where they are taken seriously by managers, funders, and any other important audience.

95-410 Blockchain Fundamentals

Intermittent: 6 units

This class will be a deep-dive into blockchain technology. We will discuss the fundamental cryptographic underpinnings of the technology as well as different consensus mechanisms currently available. We'll discuss both single-purpose blockchains such as Bitcoin as well as general-purpose implementations. We'll discuss governance of blockchain technology and related challenges, as well as legal challenges and concerns. This course will also provide an overview of blockchain programming, highlighting both existing challenges and specific nuances in blockchain programming. Students should leave the class with a better understanding of what blockchain technology is, what types of problems are best suited for blockchain-based solutions, as well as a more thorough understanding of the impact that blockchain technology is having across the board.

95-422 Managing Digital Transformation

Intermittent: 9 units

The goal of this course is to analyze and understand how technological change impacts firms, markets, supply chains, and regulatory/policy structures. Information and communication technologies play multiple roles within businesses, organizations, industries, and societies: From a technological perspective, they define the information and communication infrastructure of the entity and they enable new ways to digitize processes. From a managerial perspective, they facilitate new coordination and communication processes within and across entities, enable new organizational forms, change the information environment underlying the business, and permit new incentive and monitoring structures. From a policy perspective, these new coordination and communication processes, new organizational forms, new modes of cross-organizational interaction, and new incentive and monitor structures frequently challenge established policy and regulatory structures.

95-433 Internet of Things

Intermittent: 6 units

Prerequisites: The ability to program is a prerequisite. Course Description: Traditional products are becoming smart products and smart products are becoming connected. From smart homes to smart cities, this trend is likely to have a profound impact on our future. This course takes the view that the internet of things is best viewed as an extension of the World Wide Web. So, we will spend some time studying how the Web was designed and how its principles can be used to design the internet of things. This course combines weekly readings from journal articles with hands-on exercises and programming. The student will work with modern IOT technologies, standards, and platforms. We will connect sensors and actuators to the cloud but will do so in a way that is based on sound architectural principles.

95-443 Cybersecurity Policy and Governance

Intermittent: 12 units

Across the board, IT managers in government and industry are concerned with regulatory compliance. This course is designed to introduce students to key Information Security industry and government policies, regulations and standards. The course is structured to familiarize students with base standards, like NIST, and more specific regulatory requirements, and to help students understand how those requirements are met, using frameworks, controls and training. The goal of this course is provide students with an understanding of how to develop an organization's information security policy and procedures to comply with government and industry regulations. This course is for graduate students seeking to work or manage an information security and privacy department.

95-444 Cybersecurity Policy and Governance II

Intermittent: 6 units

The ability to secure information within a modern enterprise is a growing challenge. Threats to information security are global, persistent, and increasingly sophisticated. Long gone are the days when managers could hope to secure the enterprise through ad hoc means. Effective information security at the enterprise level requires participation, planning, and practice. Fortunately, the information security community has developed a variety of resources, methods, and best practices to help modern enterprises address the challenge. However, employing these tools demands a high degree of commitment, understanding, and skill attributes that must be sustained through constant awareness and training. An essential part of the information security plan is cyber security policy this includes the written plans for how the enterprise IT assets will be protected. This course provides students with information on the origin of cyber security policy, governance structures for policy creation, selection and implementation of policy, and audit and control functions to ensure compliance and efficacy. Students will be exposed to the national and international policy and legal considerations related to cybersecurity and cyberspace such as privacy, intellectual property, cybercrime, homeland security (i.e., critical infrastructure protection) and cyberwarfare, and the organizations involved in the formulation of such policies. Broader technology issues also are discussed to demonstrate the interdisciplinary influences and concerns that must be addressed in developing or implementing effective national cybersecurity laws and policies.

Prerequisite: 95-443 Min. grade C

95-451 Making Products Count: Data Science for Product Managers

Intermittent: 6 units

This is an undergraduate course. Graduate students looking to take this course should register for 95-851. Product managers engage in a variety of complex activities critical to product success including: Gathering product requirements; Prioritizing features; Forecasting customer demand; Customer segmentation; Pricing; Identifying buying patterns; Analyzing and responding to customer feedback. Historically decisions in these areas have often relied on intuition and guesswork, leading to misjudgment of the market and other key factors, and ultimately, product failures. Developments in data science, combining the increasing availability of data from internal and external sources with new algorithms that exploit that data at scale, offer new possibilities for putting product management decisions on a more quantitative and rigorous footing. Students in this course will be introduced to a variety of data science techniques applicable to activities to which product managers typically contribute. These techniques include clustering, classification, A/B testing, and analytics for unstructured data, including clickstreams, text, speech, and images.

95-452 Introduction to Information Security Management

Intermittent: 12 units

This course is for undergraduate students only. Graduate students looking to enroll must add themselves to 95752. This course is intended to give students an introduction to a variety of information and cyber security topics. As a survey course, it will cover foundational technical concepts as well as managerial and policy topics. Coverage includes foundations of information security; introductory cryptography; program, data, and operating system security; security of user-web interaction; safeguarding the Internet of Things; cyberwarfare; securing virtual, cloud, and mobile environments; network concepts and network security; incident management and IT auditing processes; security risk management; legal and ethical issues of security and privacy. Students are exposed to common sources of vulnerability information and how to incorporate this information into information security management processes. The purpose of the course lectures, assignments, readings, and examinations are to ensure students have sufficient technical awareness and managerial competence that will enable them to pursue advanced study in information security policy and management. There is no prerequisite for this course, however successful students will have fundamental knowledge of information and computer systems, and a general awareness of security issues in these systems.

95-455 Information Security Risk Management

Intermittent: 6 units

This is an undergraduate course. Graduate students looking to take this course should register for 95-755. This course examines risk management and its application to information security. The course will help the student identify information security risks, evaluate those risks, and make risk-based decisions given organizational resource constraints. Students will learn foundational concepts in risk management and will be introduced to risk management standards and approaches, both qualitative and quantitative, for risk analysis.

95-460 Decision Making Under Uncertainty

Intermittent: 6 units

This course provides an introduction to modeling and computational methods used by policy-makers, managers and analysts to support decision-making. The first half of the course focuses on deterministic optimization, and covers linear programming, network optimization and integer programming. The second half of this course introduces risk and uncertainty, and includes methods to characterize uncertainty and methods to optimize decisions under uncertainty. Examples are drawn from a variety of domains where these decision-making methods can provide value for business and policy, such as transportation, energy, health care, manufacturing, supply chain management, etc. The readings, lectures, homework assignments and exams will help you develop modeling skills, computational skills, and analytical skills. Modeling skills involve translating a problem into a well-defined mathematical framework, using little more than pen and paper. Computational skills involve solving your model on a computer program. In this course, all applications will be done in Excel. Analytical skills involve critically interpreting a model and translating results into insights for decision-making. All three are important!

Prerequisites: 36-226 Min. grade C and 36-225 Min. grade C

95-466 Advanced Business Analytics

Intermittent: 6 units

Growth in Web 2.0 coincides with the growth in firms ability to collect large customer data. Firms know micro level data about customer transactions and have an ability to correlate such data with other datasets. In this course, we will learn powerful but simple probability/statistical models that can be applied to fit these data to generate useful predictions. The course will go beyond pattern detections, clustering, or correlation in data to build models of plausible consumer behavior that generates the data. Thus the goal is to build a model of consumer behavior and apply this model to data to test how accurate this model is and tweak it if necessary. Most importantly, with such a model in hand, we want to predict how outcomes will change if the firm changed its strategy. Thus a key goal of the course is to teach students a model based approach to prediction.

95-481 Web Application Development

Intermittent: 6 units

This is an undergraduate course. Graduate students looking to take this course should register for 95-881. Heinz web courses are a mix of business, technology and analytics. The focus of this web course will be on the development of content-based web products with a focus on front-end programming. Programming in HTML and JavaScript will combine traditional software development combined with cutting-edge Generative AI tools.

AI-assisted development platforms will be overviewed to help generate code, debug errors, and experiment with advanced techniques. Web applications should leverage analytics-based insights to adapt to their users.

Approaches that we will cover includes the instrumentation of a web page to capture user behavior. We will analyze data indicators as an approach to characterize users. This will allow our development to be driven by the ability to personalize the web application experience. At the same time, the course will detail how the web application is used as input to search and advertising engines which use analytics to drive users, and what to do to optimize results. To accomplish all this, AI will be used to streamline your coding process, inspire creativity, and accelerate problem-solving.

95-483 Ethical Penetration Testing

Intermittent: 6 units

This is an undergraduate course. Graduate students looking to take this course should register for the cross-listed 95-883. This course will introduce students to professional penetration testing by teaching offensive tactics along with the appropriate methodologies and responsibilities it takes to ethically attack systems. The majority of time will be spent in hands-on labs performing reconnaissance, discovering vulnerabilities, developing exploits, and carefully penetrating targets.

95-499 Linux and Open Source

Fall and Spring: 6 units

This course covers the Linux operating system, its related applications, and the Open Source Software (OSS) model. Emphasis is on how Linux is different from other systems. Note example syllabus may be from online or on-campus Mini. Topics and general structure are the same, quiz and participation grading vary between online or on-campus.

95-752 Introduction to Information Security Management

Fall and Spring: 12 units

This course is intended to give students an introduction to a variety of information and cyber security topics. As an introductory course, it will cover foundational technical concepts as well as managerial and policy topics. The purpose of the course lectures, assignments, reading, in-class presentations, and examinations are to ensure students have sufficient technical awareness and managerial competence that will enable them to pursue advanced study in information security policy and management as they progress through their program. There is no prerequisite for this course, however successful students will have fundamental knowledge of information and computer systems, and a general awareness of security issues in these systems.

Course Website: https://api.heinz.cmu.edu/courses_api/course_detail/95-752/

95-808 IT Project Management

Intermittent: 6 units

From the smallest to the largest organization, the electronic storage and flow of information is critical to the successful achievement of goals, objectives and the provision of products and services. To manage that delivery process, we now find the construct mechanism for the delivery of those products and services to be the "Project" rather than a series of non-integrated tasks. The increased dependence upon projects necessitates the need for both improved project management and oversight. The purpose of this course is to assist professionals in understanding the components of complex projects, manage those project components, and to form and lead a project team. Project Management tools and techniques will be introduced, discussed, and applied.

Course Website: https://api.heinz.cmu.edu/courses_api/course_detail/95-808

95-818 Privacy, Policy, Law And Technology

Fall: 12 units

This course focuses on policy issues related to privacy from the perspectives of governments, organizations, and individuals. We will begin with a historical and philosophical study of privacy and then explore recent public policy issues. We will examine the privacy protections provided by laws and regulations, as well as the way technology can be used to protect privacy. We will emphasize technology-related privacy concerns and mitigation, for example: social networks, smartphones, behavioral advertising (and tools to prevent targeted advertising and tracking), anonymous communication systems, big data, and drones. This course is part of a three-course series of privacy courses offered as part of the MSIT-Privacy Engineering masters program. These courses may be taken in any order or simultaneously. Foundations of Privacy (offered in the Fall semester) offers more in depth coverage of technologies and algorithms used to reason about and protect privacy. Engineering Privacy in Software (offered in the Spring semester) focuses on the methods and tools needed to design systems for privacy.

Course Website: <http://cups.cs.cmu.edu/courses/privpolawtech.html>

School of Public Policy & Management Courses**90-401 Media & Communication Design I**

Intermittent: 6 units

The Media and Communication Design course focuses on using desktop publishing software to effectively communicate messages in printed form. The goal of this course is to use the combination of type, color, shapes, illustrations and images to produce professional printed materials. The skills learned in this course can easily be translated to other media. This course will teach a combination of graphic design skills and software skills. Most classes will consist of two thirds lecture and one third hands-on work with the software. The software being taught is Adobe InDesign Creative Cloud (CC), Adobe Illustrator CC and Adobe Photoshop CC. Students will gain experience in preparing documents that are professional in form and content. Student will learn how to design and publish products such as newsletters, posters, logos, packaging, signs, books, flyers, magazines, annual reports, invitations and advertisements. Students will also learn the terminology, procedures and production requirement to effectively communicate with ad agencies, design firms and commercial printers.

90-403 Gender, Politics and Policies in the US and Across the World

Spring: 6 units

1.-Women political participation in the U.S. and in selected countries across the world including the expansion of political and voting rights, the role of women as political leaders and the overall participation of women in the political and policymaking process. Within the U.S., we will pay attention to the situation of racial and sexual minorities including African-American and Latina women, as well as issues affecting Lesbian and Transgender Women. 2.-The evolution of women's economic rights in the U.S. and selected countries. Central issues here are the wage gap, the glass ceiling, and the overall female participation in the private sector. 3.-Women in conflict and sex trafficking: Lastly, the course will examine the role of women in conflict as both participants and victims as well as the role of both men and women in preventing sex trafficking. Goals of this course: The readings and class discussions are going to focus not only what has happened, but also on the policies that are been implemented and should be implemented to reduce the negative effect of past actions. The course should be of interest to both men and women because we are all part of the same society.

90-404 Poverty Reduction and Social Policies in the US

Fall and Spring: 6 units

The goal of this course is to analyze the impact that current U.S. social policies have on reducing poverty and inequality and creating a more just society. The first section discusses the concepts of poverty and inequality, and it is followed by a section on anti-poverty policies pursued in Western Europe. This section includes a discussion of the Welfare State policies in Europe, which have served as a model for universal policies. The bulk of the class is geared to analyzing some of the most critical U.S. social policies including social security, welfare, housing, and health, as well as childcare and child benefits. The policy analysis will emphasize the non-universal nature of the policies and their unequal racial and gender impact. Examples from other countries where those policies have been more successful will be used throughout the class to inform recommendations for better policies. The course will be structured around lectures, class discussions and student presentations.

90-434 Geospatial Health Analytics

Spring: 12 units

This course is taught with asynchronous video lectures and readings with in-person and remote office hours. A geographic information system (GIS) provides an effective way to visualize, organize and manage a wide variety of information including administrative and medical record data, environmental health, social services, and other location data. Public health departments, hospitals, and medical research agencies are using GIS to map health-related events, identify disease clusters, investigate environmental health problems, and understand the spread of disease. This course uses a unique approach for teaching GIS in health care. It involves learning how to use GIS software in the context of carrying out projects for visualizing and analyzing health-related data. Each week includes lectures and computer labs that focus on a health, technical, or policy issue which use Esri's ArcGIS Pro and Platform technologies to analyze data or solve a problem. Students learn to create Story Maps and Dashboards to convey their maps and associated text to the public and decision makers. Through assignments and projects students will not only learn how to use the software but will also learn the many distinctive advantages of using GIS for health care policy making and planning. By the end of the course, students will have sufficient background so that they can become expert users of GIS in health organizations - building, managing, and using GIS maps and health data. Prerequisites: 90-728 Introduction to Database Management, 91-802 Information Systems for Managers or permission of instructor. Prerequisites: 91-802 Min. grade C or 90-838 Min. grade C or 90-728 Min. grade C or 67-262 Min. grade C

90-435 Public Finance

Fall: 12 units

The purpose of Public Finance (90-736/90-435) is to provide an introduction to the theory and practice of how national, regional and local governments should and actually finance their budgets for operating and capital project purposes. To accomplish this, the course reviews: i) rationales for government intervention in the market place, ii) analyzes methods of resolving conflicts over the size of the public sector budget, iii) extensively analyzes the rationales and issues of various types of tax revenue, and iv) reviews the effects of public sector spending and taxes on the aggregate economy. Throughout, Public Finance emphasizes the interplay between how current revenue policy is fashioned, and how the models and their key assumptions along with political processes interact which result in changes in current law at the federal, state, and local levels. While the examples are largely drawn from the US, examples are also drawn from around the world. Because the subject matter of public spending and revenues can easily consume an entire academic year of study, Public Finance focuses mainly on the revenue side of the public budget. Two courses typically offered by Professor Strauss in the Spring build on Public Finance. Public Expenditure Analysis (90-774/90-474) deals with techniques for evaluating private and public expenditure and capital spending decisions. Education Finance and Policy (90-817) deals in-depth with issues surrounding multi-level government finance from US and international perspectives. While Public Finance and Public Expenditure Analysis are self-contained, students who have had a semester of statistics and a semester of micro-economics at the principles or Advanced Placement levels will be more comfortable. For more information about Professor Strauss and this course, see respectively: www.andrew.cmu.edu/user/rs9f under Teaching for the current course outline.

Course Website: https://api.heinz.cmu.edu/courses_api/course_detail/90-736

90-436 Health Systems

Fall: 6 units

Health Policy and Delivery Systems is a foundation course intended to introduce students to many of the broad subjects that will be detailed in more advanced course work. This introduction provides a framework to aid students in navigating from public policy through to healthcare delivery. Public policy is the study of the written and unwritten principles on which law is based. Laws and regulations translate policy into action. Public policy and laws form the basis of health policy. Health policy is supported by: - Public health initiatives focused on preventing disease, prolonging life and promoting health for the entire population. (i.e. diabetes awareness) - Population health is interested in the outcomes of individual groups and the distribution of outcomes among the groups. (i.e. income equality and infant mortality) - Healthcare delivery is focused on access, quality, and cost. At this time in our history, Healthcare Reform best embodies the intent of this aspect of health policy. Through the use of group assignments, students will create a model which links the external environment into healthcare delivery profitability. Modeling is a form of combining individual technical components with the greater knowledge and conceptualization of the entire process. Its promise is to promote better decision making by envisioning how micro decisions interconnect to mission, goals, and outcomes.

90-440 Critical Analysis of Policy Research

Fall and Spring: 12 units

This course is not intended for Heinz College graduate level students. Heinz graduate students should register for the corresponding graduate course 90-822. This course is intended for undergraduate students who are in their third year or later. This course prepares students to understand, interpret, and critique existing policy research. The course focuses on the development of three essential skills for policy analysts: 1) Read and interpret empirical results in published research. 2) Understand the assumptions needed to infer causal relationships and assess their plausibility. 3) Recognize common problems in policy research, including reverse causality, omitted variables, measurement error, etc., and use graphical methods to determine the direction of the resulting statistical bias. Using these three skills, students will practice understanding and critiquing policy research. Moreover, by identifying and understanding potential problems, students can make valid conclusions even from seriously flawed research. At the end of the class, students demonstrate these skills by independently evaluating an existing piece of research of their choice, presenting their findings in a written report and in-class presentation.

90-443 Local and Regional Economic Development

Intermittent: 6 units

The course will introduce students to the theory and practice of economic development in the United States. An introduction to basic analytic techniques used by both researchers and economic development practitioners will be coupled with a broad overview of the research literature in the fields of urban and regional economics. Emphasis will be placed on the public sector's role in promoting economic development and public policy at the federal, state and local levels that are focused on improving economic conditions for people, places and regions. Optional readings will focus on Pittsburgh's economic development and regional economic change since WWII.

90-445 Social Entrepreneurship

Intermittent: 6 units

With a world threatened by rising inequalities (especially in the post-pandemic time) and the effects of climate change, we are in the middle of an era where we are seeing the growth of social entrepreneurship - both in the upsurge of new ventures and within corporations as they seek to respond to demand from their consumers and the public toward a focus not solely on profit, but on a "triple bottom line" - an equivalent focus on PURPOSE and #8212; people and the planet. This course is for students that want to learn how to take ideas that respond to societal needs and frame it within a sustainable business structure. Ideas may be for new social ventures or innovations within existing institutions and corporations. The students will work on an idea they have and take it through a model "accelerator" program curriculum. Accelerators are "fixed-term cohort-based programs that include seed investment, mentorship," a curriculum that aims to fast forward business planning and strategy and culminate in what is typically called "demo day" - an opportunity for participating teams to present to potential investors. The course is open to students from different disciplines. This course will utilize online resources as well as readings culled from leading resources on lean business planning. It is an applied learning course and will require working practical knowledge of basic financial statements. At the end of the course, students will be able to take an idea through a model accelerator curriculum - from establishing a mission, vision, theories of change and impact pathways to market and competitive analysis, identifying target markets, customer acquisition, basic financial modeling to crafting the pitch deck. Students will be able to understand a basic structure to business modeling that they can use to form the basic guiding foundations to future new ventures - as startups or as innovations within corporations.

90-449 Elective Politics and Policy-Making

Intermittent: 6 units

Significant proposals in public policy at the local, state and federal level of the U.S. require usually require legislation to become a reality. Enter politicians, politics, and political processes. Elected politicians, both representatives and executives, are the ultimate arbitrators and decision-makers in public policy change. The political process can be very messy. Nonetheless public policy change can be successfully "engineered" from an idea to a reality. This course will explore past cases involving elected officials from the Pittsburgh region and Pennsylvania to illustrate the people, politics and processes involved in policy change. Students will then be required to apply what they learn from these cases to a contemporary policy challenge facing the Pittsburgh region.

90-463 Policy and Leadership in Public Education

Fall: 6 units

This course introduces students to policy issues in public education while simultaneously building the skills to lead change through authentic assignments and in-class collaboration. The course addresses both the "what" and the "how" of leading policy change, combining content presentation and discussion with an iterative approach to each assignment. The content of the course will consist of four aspects of education policy: 1) the basics: the purpose of schooling as well as the current structure and legislative landscape within K-12 public education in the United States, 2) what is taught: policy and practice around curriculum, standards, and assessment, 3) who teaches: human capital strategy and policy and 4) where does education take place: school design and structure, including opportunities for transforming how students learn.

90-472 Health Policy

Spring: 6 units

This course introduces students to the concepts, theories, and tools of health policy. The aims of this course are to provide students with (1) the ability to identify key problems facing the United States health system, (2) increase the appreciation for and understanding of health policy as an important and useful tool for enhancing population health, and (3) mechanisms to address a current health policy issue from legal, economic, behavioral, and political perspectives. In addition, students will be introduced to a cross-national comparison of health systems. Prerequisite: 90-436 Min. grade C

90-475 Methods of Policy Analysis: Future of Work

Spring: 12 units

Grad students should take 90745 instead. After decades of slow wage growth and rising inequality, many American workers now fear an epidemic of joblessness as new technologies increasingly replace human labor. Is this likely to occur? How will emerging technologies reshape the US labor market? How important is the "gig economy," and how might it become? What impact will the shocks generated by the COVID crisis and rising inflation have on employment and income inequality in the short run and the long run? What can policy makers do to ensure that the growth of the American economy is more inclusive and equitable? The curriculum has been rewritten to help students think seriously and rigorously about the future of work in the 21st century American economy. The course will place current concerns in the broader context of the major structural shifts in the US labor market over the past several decades. Drawing upon the most recent quant analyses, the course will show that technological change has contributed to increasingly unequal outcomes in the US labor market for decades, and that this trend is likely to continue as a new wave of technological change unfolds. The course will also consider the degree to which globalization, immigration, rising monopoly power, declining union strength, minimum wage laws, and discrimination based on race and gender have contributed to rising inequality in US incomes. The course will draw upon frontier research to identify old and new policy ideas that could help make economic growth more inclusive, and it will bring into the classroom policy entrepreneurs who are making a real difference. The course instructor, Professor Lee Branstetter, is a globally recognized expert on the economics of innovation and technological change. He leads the Future of Work research initiative within CMU's Block Center for Technology and Society. In 2011-12, he served on the staff of President Obama's Council of Economic Advisers.

90-489 Resilient & Sustainable Communities

Intermittent: 12 units

90-489: This course is a parallel listing for the graduate level listing of 90-789 under the same title. This course examines past and current community development topics and trends associated with creating and/or maintaining resilient and sustainable communities. Such topics include sustainable development, community equity, creative capitalism, regional planning and visioning, environmental justice, governance, regional equitable development, sustainable business practices, green/clean tech, smart growth and smart transportation, carbon management, resource conservation, local living economies, energy systems and strategies, dynamics of neighborhoods, among other topics. Emphasis will fall on how these various dimensions need to strategically align to promote sustainable communities amidst their complexities. The class will also delve into a variety of community development practices to provide frameworks for integrating just, equitable, and fair community development practices with sustainable development practices. The class takes lessons from the past (both what has worked and what did not work) as well as appropriate, current practices and explores how to apply them to a variety of community situations and conditions. The focus is on urban communities in the U.S and worldwide, both large and small. The course includes experiential, hands-on learning (projects, case studies, analyses, presentations, field trips, and guest lectures) as well as reflective components (readings, discussion, and papers).

90-718 Strategic Presentation Skills

Fall and Spring: 6 units

Strategic Presentation Skills provides practical instruction for preparing and delivering professional presentations. Activities and assignments include: analyzing audience members, writing outlines, creating cohesive visuals, and speaking extemporaneously. Students target and engage specific audiences using a communication style suitable for workplace environments. Overall, the course helps students develop confidence and apply effective techniques when speaking in a public setting.

Course Website: <http://www.heinz.cmu.edu/academic-resources/course-results/course-details/index.aspx?cid=477> (<http://www.heinz.cmu.edu/academic-resources/course-results/course-details/?cid=477>)

90-723 Financial Statements and Analysis

Spring: 6 units

This course provides an overview of how managers and executives utilize accounting and finance to make decisions. The course will begin by gaining an understanding of the financial reporting process and the organizations that govern financial accounting. We will learn key terms relevant to the main financial statements and how data flows through to connect the statements. After understanding key components of the various financial statements, we will utilize ratio and variance analysis to determine a company's financial position. Expanding on our financial analysis we will cover various budgeting methods for capital investment decisions.

Course Website: <https://www.heinz.cmu.edu/current-students/courses/90-723>

90-758 Analysis of US Presidential Powers

Spring: 6 units

This course will explore the evolution of presidential power and the underlying theories that support the expansion of the executive branch in contemporary politics. Some of the topics that will be covered include - emergency powers, presidential immunity, the "Steel Seizure" case, the pardon power, the Iran-Contra scandal and impeachment. Given that this is an election year having a fuller understanding of the President's potential power is fundamental for the next office holder.

Course Website: <http://www.heinz.cmu.edu/academic-resources/course-results/course-details/index.aspx?cid=58> (<http://www.heinz.cmu.edu/academic-resources/course-results/course-details/?cid=58>)

90-789 Resilient & Sustainable Communities

Spring: 12 units

This course examines past and current community development topics and trends associated with creating and/or maintaining resilient and sustainable communities. Such topics include sustainable development, community equity, creative capitalism, regional planning and visioning, environmental justice, governance, regional equitable development, sustainable business practices, green/clean tech, smart growth and smart transportation, carbon management, resource conservation, local living economies, energy systems and strategies, dynamics of neighborhoods, among other topics. Emphasis will fall on how these various dimensions need to strategically align to promote sustainable communities amidst their complexities. The class will also delve into a variety of community development practices to provide frameworks for integrating just, equitable, and fair community development practices with sustainable development practices. The class takes lessons from the past (both what has worked and what did not work) as well as appropriate, current practices and explores how to apply them to a variety of community situations and conditions. The focus is on urban communities in the U.S and worldwide, both large and small. The course includes experiential, hands-on learning (projects, case studies, analyses, presentations, field trips, and guest lectures) as well as reflective components (readings, discussion, and papers).

90-798 Systems Analysis: Environmental Policy

Fall: 12 units

Systems Analysis: Environmental Policy provides an introduction to how environmental policies have been and can be designed/created implemented and evaluated amidst complex information-based social political and cultural processes. The course emphasizes a systems-based methodological approach for addressing the complexities involved in framing, analyzing, and designing an implementation plan for policy construction. The course also explores through landmark and contemporary case studies several dimensions of environmental policymaking: * Contextual historical and structural aspects of environmental policymaking at the local state federal and international levels * Use of quantitative and qualitative analytical tools (from the core program as well as new tools) * The process of how policies derive their meaning. * Contemporary challenges and opportunities in environmental policymaking. Strategies for successful policymaking in the contemporary landscape.

Course Website: <http://www.heinz.cmu.edu/academic-resources/course-results/course-details/index.aspx?cid=85> (<http://www.heinz.cmu.edu/academic-resources/course-results/course-details/?cid=85>)

90-808 US Energy Policy

Fall: 6 units

This seminar will provide an introduction to modern U.S. energy and climate policy. Our goal will be to understand, from a practical perspective, how economics, technology, politics, public opinion and national security all influence the development and implementation of policy. With the ongoing need for an energy transition, the focus on climate change, and the impacts of the war in Ukraine, the need for understanding these issues is more important than ever. Questions that we will address include: Why has energy and climate taken on such a critical role in the public policy agenda? How has US policy changed over the years and what lessons have we learned from past initiatives? How much influence does government really have? How have new technologies changed the energy landscape and our interactions with other countries? The class will begin with an overview of the energy sector and the related government structure. We will then discuss Presidential initiatives and legislative activity, with particular attention to current efforts by the Biden Administration. We will consider case studies, such as the Keystone Pipeline and carbon pricing, that demonstrate conflicting viewpoints about appropriate energy policy. The class will also explore international energy issues like liquefied natural gas and crude oil exports, as well as UN climate agreements. This course is a seminar class; I will provide a framework and then guide a discussion among the students. We will hear from guest speakers, including a number of current and former senior government officials.

Course Website: https://api.heinz.cmu.edu/courses_api/course_detail/90-808

90-834 Geospatial Health Analytics

Fall and Spring: 12 units

This course is taught with asynchronous video lectures and readings with in-person and remote office hours. A geographic information system (GIS) provides an effective way to visualize, organize and manage a wide variety of information including administrative and medical record data, environmental health, social services, and other location data. Public health departments, hospitals, and medical research agencies are using GIS to map health-related events, identify disease clusters, investigate environmental health problems, and understand the spread of disease. This course uses a unique approach for teaching GIS in health care. It involves learning how to use GIS software in the context of carrying out projects for visualizing and analyzing health-related data. Each week includes lectures and computer labs that focus on a health, technical, or policy issue which use Esri's ArcGIS Pro and Platform technologies to analyze data or solve a problem. Students learn to create Story Maps and Dashboards to convey their maps and associated text to the public and decision makers. Through assignments and projects students will not only learn how to use the software but will also learn the many distinctive advantages of using GIS for health care policy making and planning. By the end of the course, students will have sufficient background so that they can become expert users of GIS in health organizations - building, managing, and using GIS maps and health data. Prerequisites: 90-728 Introduction to Database Management, 91-802 Information Systems for Managers or permission of instructor.

Course Website: <http://heinz.cmu.edu/academic-resources/course-results/course-details/index.aspx?cid=120> (<http://heinz.cmu.edu/academic-resources/course-results/course-details/?cid=120>)

90-836 Health Systems

Fall: 6 units

Health Policy and Delivery Systems is a foundation course intended to introduce students to many of the broad subjects that will be detailed in more advanced course work. This introduction provides a framework to aid students in navigating from public policy through to healthcare delivery. Public policy is the study of the written and unwritten principles on which law is based. Laws and regulations translate policy into action. Public policy and laws form the basis of health policy. Health policy is supported by: - Public health initiatives focused on preventing disease, prolonging life and promoting health for the entire population. (i.e. diabetes awareness) - Population health is interested in the outcomes of individual groups and the distribution of outcomes among the groups. (i.e. income equality and infant mortality) - Healthcare delivery is focused on access, quality, and cost. At this time in our history, Healthcare Reform best embodies the intent of this aspect of health policy. Through the use of group assignments, students will create a model which links the external environment into healthcare delivery profitability. Modeling is a form of combining individual technical components with the greater knowledge and conceptualization of the entire process. Its promise is to promote better decision making by envisioning how micro decisions interconnect to mission, goals, and outcomes.

Course Website: <https://www.heinz.cmu.edu/current-students/courses/90-836>

90-861 Health Policy

Fall: 6 units

This course introduces students to the concepts, theories, and tools of health policy. The aims of this course are to provide students with (1) the ability to identify key problems facing the United States health system, (2) increase the appreciation for and understanding of health policy as an important and useful tool for enhancing population health, and (3) mechanisms to address a current health policy issue from legal, economic, behavioral, and political perspectives. In addition, students will be introduced to a cross-national comparison of health systems. Prerequisite: 90-836 Min. grade C

Course Website: <http://www.heinz.cmu.edu/academic-resources/course-results/course-details/index.aspx?cid=140> (<http://www.heinz.cmu.edu/academic-resources/course-results/course-details/?cid=140>)

90-882 Behavioral Economics in Public Policy

All Semesters: 12 units

"Economics has up to now been the social science that has been most broadly and deeply involved in public policy. With its rational choice perspective, the economic perspective has tended to favor certain types of policies, namely those that enhance the efficiency of market mechanisms and lower the cost of information. In this course we will spend the first several classes reviewing the assumptions, implications for public policy, and limitations of the rational choice perspective. The remainder of the course will then be devoted to examining different public policy issues, including saving, health care, crime and drug abuse, through the competing lenses of traditional and behavioral economics."