

HEALTHCARE INDUSTRY

SPS Certificate website: <https://sps.northwestern.edu/graduate-certificates/healthcare-industry/>

This certificate is designed for those from a variety of academic and professional backgrounds looking to enter the growing health and life sciences fields. Combining courses from the Health Informatics and Regulatory Compliance programs, the certificate introduces students to the U.S. healthcare system and the policies and regulations that affect it, as well as the ways clinicians make decisions about care within this context. For the final course in the program, students can emphasize risk management in life science industries (MSRC 435-DL Risk and Decision Management) or quality assurance in regulated industries such as the medical device manufacturing sector (MSRC 401-DL Quality Systems).

Certificate Offered

- Healthcare Industry, Graduate Certificate (<https://catalogs.northwestern.edu/sps/certificates/graduate/healthcare-industry/healthcare-industry-graduate-certificate/>)

Healthcare Industry Courses

HC_COM 410-DL Healthcare Regulatory Environment (1 Unit)

This course facilitates an in-depth exploration of the healthcare laws, regulations, statutes, policy guidance and enforcement initiatives that serve as a framework for healthcare compliance. Topics include but are not limited to legal and ethical issues, patient safety, patient privacy and security, coding and billing, conflict of interest, anti-kickback, and False Claims.

HC_COM 411-DL Healthcare Programs and Enforcement (1 Unit)

This course provides a comprehensive overview of health care compliance programs, including each of the seven core elements and strategies for developing, implementing and managing effective compliance programs in a heavily regulated environment. The course describes compliance healthcare enforcement authorities, such as Medicare and Medicaid auditors (e.g., Recovery Auditors, UPIC's) and current key healthcare fraud initiatives. Topics also include the basics of conducting risk assessments, audits and investigations. Previous title: Healthcare Compliance Programs.

HC_COM 413-DL Healthcare Billing Models & Systems (1 Unit)

This course provides a basic understanding of billing and payment structure for healthcare services in the U.S. and systems that promote compliance with federal and state laws, audits, and communications with government and other parties. See the MSRC website for more details.

HC_COM 415-DL IT Systems Compliance (1 Unit)

Provides a working knowledge of the compliance oversight of healthcare IT systems. Focus is on systems used in healthcare service provider settings. Topics include identification of legal and regulatory computer system requirements used in the industry; ensuring system specifications and configurations meet regulatory requirements; setting criteria of system documentation to ensure compliance to inspectors; ensuring cyber security risks are mitigated; addressing European Union Privacy Laws for international systems; and identifying special considerations for mobile devices. Students will have the ability to manage the compliance aspects of IT systems throughout the system lifecycle (acquisition, upgrades and retirement). Students learn how to build procedures to address any system violations.

MHI 401-DL American Health Care System (1 Unit)

Provides knowledge of the key components of health care in the US-the policy, economic, and societal forces that shape health care delivery. An introduction to elements of the American health care system, including the provider components, the financing of health care, the basic structure of public policy making and public health systems, a comparative analysis of the American system to health care systems of other countries, and the legal and regulatory framework within the American health care system functions. In addition to the structural components of the system, the course reviews current issues within the American health care system, including public health, preparedness, quality of health care, health reform, payment mechanisms, and consumerism.

MHI 402-DL Introduction to Clinical Thinking (1 Unit)

Provides insight into the clinical care process. Designed for students not previously involved in clinical medicine as a nurse, pharmacist, or physician, as well as those trained in medicine outside the U.S. Includes basic medical terminology and introductory psychophysiology. Topics include eliciting information from patients, synthesizing history and physical examination, decision making for ordering tests, establishing diagnoses, treatment planning, integrating evidence-based medicine, and using an intelligent medical record in a complex environment.

MHI 403-DL Fundamentals of Health Informatics (1 Unit)

The course is an introductory survey of fundamentals of health information technology. Topics center on how information technology enables patient care, how information technology is used by healthcare providers and caregivers, and its use to fuel modern health care organizations. This course provides an overview of health informatics with emphasis on the factors that helped create and sustain this new field, the key players involved, and the impact health information technology is having on the delivery of care in a rapidly changing healthcare marketplace.

MHI 404-DL Health Care Operations (1 Unit)

This course examines various aspects of healthcare delivery, with a special focus on healthcare operations and its management to confront the many challenges faced by modern healthcare organizations today with the limited resources at their disposal. Students will learn about the role of strategic planning and governance, interdisciplinary care, patient safety and quality improvement, emergency preparedness, cybersecurity, finance, change management, information technology and data analytics. Recommended taking after MHI 401-DL and MHI 403-DL.

MHI 405-DL HIT Standards and Interoperability (1 Unit)

This course provides concepts and practical examples of health care information interoperability, standard terminologies, messaging standards, health information exchanges (HIEs), and projects deploying these capabilities. Topics covered by the course include the importance of standards; information architecture and application programming interfaces (APIs); principles and examples of standard terminologies; current messaging standards; and their use in health information exchanges for coordination of care and payment reform. Core principles, challenges, benefits, and limitations will be discussed in each of these topics.

MHI 406-DL Decision Support Systems and Health Care (1 Unit)

This course provides an introduction to decision analysis with an emphasis on medical decision-making and elements of human cognition under uncertainty. Topics include structuring decision problems and developing creative decision options, quantifying uncertainty and preferences, and combining them to arrive at optimal decisions. Also provides the foundation needed to apply the methods of decision analysis in decision support systems and intelligent systems. Students become familiar with the graphical display of medical information, decision analysis and modeling, evidence-based medicine, Bayes'

theorem, knowledge-based systems, learning systems, lexicons, coding and structured data entry, and data mining techniques.

MHI 407-DL Legal, Ethical, and Social Issues (1 Unit)

The American health care landscape is incredibly dynamic, rapidly evolving, and highly regulated. This course explores the intersection of compelling legal, ethical, and social facets that impact the health care enterprise. The content, research, and group discussions support informaticists in building knowledge they need to navigate competing interests, underlying ethical principles, and key regulatory requirements. The course integrates changing financing paradigms, reimagined health care services delivery systems, the tension between precision medicine and population health, and evolving consumer expectations in the digital age. The challenges of safeguarding individual privacy rights and data security are assessed, along with the promise of innovative public-private partnerships that are shaping health informatics in the Learning Health Care System.

MHI 408-DL Information System Acquisition & Lifecycle (1 Unit)

A practical course on acquiring and assessing new medical technology, either as a vendor who needs to know how to meet the expectations of customers and their acquisition requirements or as a customer/practitioner who must know how to validate technology selections and implementations. Topics include cost analysis and justification, economic models, capital purchase, leasing strategies, the application service provider or risk-sharing model, purchase agreements and contracts, writing a RFP, analyzing a RFP response, and industry business trends.

MHI 413-DL Consumer Digital Health (1 Unit)

This course introduces the emerging practice area of Consumer eHealth, the aim of which is to empower consumers to better manage and influence their health and wellness, access healthcare services, and improve interactions with their caregivers by leveraging digital health solutions and services. Topics include solutions that emphasize the consumer experience (CX), new consumer access models and modalities, consumer-oriented technologies and systems such as APPs and health and wellness devices and platforms, HIPAA-compliant cloud based services, the use of innovative wearables (i.e., electronic tattoos), internables/ingestibles and consumables, and behavioral management solutions such as Digiceuticals and PHRs.

MHI 498-DL Capstone Project (1 Unit)

As a culminating experience, students will put into practice the knowledge and skills they have learned during their coursework through a Capstone Project. Students will have the opportunity to develop and implement a Health Informatics project with an industry or university partner or in their workplace. Alternatively, students can develop a culminating, two-part project. This alternative capstone project will leverage health informatics to provide an innovative, consultative response to a need or problem arising as part of a real-world case study. The project will challenge each student to conduct and integrate comprehensive research and to apply knowledge, skills, and competencies built through coursework they have completed in the MHI program. In addition to each student's individual research and project development, the course emphasizes collaboration with fellow students by using the Canvas discussion board to crowdsource strategies and approaches for their Capstone Project. Each student will work with the instructor to establish an "Advisory Committee" for their project which, ideally, will be comprised of a "Knowledge Expert" from the organization they are working with and a faculty advisor from the Northwestern University Health Informatics program. (Required: The earliest students may take Capstone in the quarter of their final MHI course in the program.)

MHI 590-0 Thesis Research (1 Unit)

This final project is meant to represent the culmination of students' experience in the program and must demonstrate mastery of the curriculum and ability to conduct sustained independent research and analysis. The project may be applied or may be a traditional scholarly paper, in both cases a write-up following the paper's program-specific guidelines is required. Students must submit a proposal and secure a first reader in order to register; for further details students are advised to review the student handbook and contact their academic adviser. (Required: Completion of all core courses in the student's graduate program and specialization.)

MSRC 401-DL Quality Systems (1 Unit)

Introduction to essential quality systems and the domestic and global regulatory landscape governing regulated industries. Includes a review of the historical context for the creation of the organizations that protect public health, including the Department of Health and Human Services and the Food and Drug Administration. Discusses the pivotal role of quality in determining value chains and innovation; compliance with quality systems contained within the Code of Federal Regulations (GxP and DHHS regulations), Malcolm Baldrige National Quality Award, International Organization for Standards, Total Quality Management, and International Conference on Harmonization, FDA Quality System Inspection Technique, National Committee for Quality Assurance and The Joint Commission for Accreditation of Healthcare Systems.

MSRC 405-DL Applied Research and Writing (1 Unit)

This course provides a foundation for writing academic and technical papers, affording students the opportunity to recognize and address the strengths and weaknesses in their own critical thinking and writing skills. The course emphasizes logical argument development, structure, clarity of thinking, and effective use of documentation. Students learn to evaluate the strengths and limitations of various research methods and how to select the best method for a given task.

MSRC 435-DL Risk and Decision Management (1 Unit)

This course explores theories and practical applications of risk management, risk communication, decision management, and crisis management in life science industries. Topics include failure modes and effects analysis; fault-tree analysis; human factors analysis, and hazard analysis and critical control points. Students learn to anticipate and avoid risk and hazards and manage those that arise in a holistic manner.

MSRC 481-DL Leadership in the Regulatory Environment (1 Unit)

Topics include leading teams, communication strategies, and navigating the particular challenges of the regulatory environment.

MSRC 498-DL Capstone (1 Unit)

The capstone project course is the culmination of the MSRC program and demonstrates to faculty a student's mastery of the curriculum and core competencies in the regulatory field. Assignments are chosen by the instructor. Students are individually assessed and graded throughout duration of the ten week class. Students should retain all course material from previous classes in the program, including textbooks, to successfully complete assignments.

Prerequisite: 9 courses and a 3.0 GPA.

MSRC 499-0 Independent Study (1 Unit)

Independent study.

MSRC 590-0 Thesis Research (1 Unit)

Independent thesis research.