

# Medical Center Campus Interdisciplinary Studies

The Master of Science in Health Informatics (MSHI) and Health Informatics certificate are moving to the Department of Health Information Management in the School of Health Professions, effective August 1, 2025. Future students interested in Health Informatics should explore degree options in the Department of Health Information Management (<https://www.kumc.edu/school-of-health-professions/academics/departments/health-information-management.html>) or contact [him@kumc.edu](mailto:him@kumc.edu).

Master of Science in Health Informatics (<https://catalog.ku.edu/nursing/ms-health-informatics/>)

Health Informatics Graduate Certificate (<https://catalog.ku.edu/medicalcentercampusinterdisciplinarystudies/healthinfogradcert/>)

## Nursing (Graduate) Courses

### IPHI 850. Introduction to Health Informatics. 2 Credits.

This course provides a broad survey of health informatics focused on five themes: health informatics foundations; clinical decision support; human factors/organization factors; public health informatics and current issues in health informatics including best practices.

### IPHI 851. Transforming Health Care through Use of Information Systems and Technology. 3 Credits.

The application of the information system development life cycle in the design, selection, and implementation of health information technology applications will be examined. Human computer interactions and emerging technologies will be explored for their impact on patient care and safety. The role of legal, regulatory, ethical, and security issues will be discussed as they apply to clinical and consumer information technologies. KU DNP students may count this course as 2 credit hours of lecture and 1 credit hour of practicum.

### IPHI 852. Health Data Theory and Practice. 3 Credits.

Data science concepts and database theory as related to healthcare settings will be introduced. Simple database modeling, design, and manipulation will be explored using a database management system and a query language. Key data science methods, such as data wrangling and visualization, will be leveraged for decision making. KU DNP students may count this course as 2 credit hours of lecture and 1 credit hour of practicum.

### IPHI 853. Abstraction and Modeling of Healthcare Information. 3 Credits.

The information system development life cycle process is presented with emphasis on determination and analysis of information system requirements and system design that meet the identified healthcare information requirements. Object-oriented techniques, such as Unified Modeling Language and Unified Modeling Methodology, will be introduced to facilitate process analysis and design proposal development. KU DNP students may count this course as 2 credit hours of lecture and 1 credit hour of practicum. It is recommended that students take IPHI 820 prior to this course.

### IPHI 854. Knowledge Management in Health Care. 3 Credits.

Knowledge management is the creation, communication, and leveraging of a healthcare organization's knowledge assets. Defining knowledge, describing the knowledge creation cycle, and the identification of the knowledge workers and their impact on the organization are discussed.

Information technology and communities of practice are presented in a balanced approach to support a systematic viewpoint of the knowledge management process. Knowledge management theory is enhanced with the performance of a knowledge audit and the development of knowledge management tools. KU DNP students may count this course as 2 credit hours of lecture and 1 credit hour of practicum. It is recommended that students take IPHI 820 prior to this course.

### IPHI 856. Health Informatics Practicum. 1-3 Credits.

In collaboration with health informatics faculty and preceptors, students design an experience to facilitate the application of theories and research related to health informatics. Emphasis is on the application of the information system development life cycle. Students analyze the leadership and technical behaviors of various informatics roles and negotiate an informatics project to be completed within the practicum. Prerequisite: IPHI 850, 851, 852, 853, 854, leadership electives, and focus area electives, or consent of instructor.

### IPHI 858. Health Informatics Practicum: Pharmacy. 4 Credits.

In collaboration with health informatics faculty and preceptors, students design an experience to facilitate application of theories and research related to health informatics in a pharmacy setting. Emphasis is on the application of the information system development life cycle. Students analyze the leadership and technical behaviors of various informatics roles and negotiate an informatics project to be completed within the practicum. This course is only open to students enrolled in the dual PharmD and Health Informatics programs. Prerequisite: IPHI 850, 851, 852, 853, 854 and focus area electives, or consent of instructor.

### IPHI 860. Health Informatics Scholarly Project. 2 Credits.

This research or evidence-based project course is designed for students to apply knowledge from their coursework. Students will work with a faculty mentor on components of a research, quality improvement, or evidence-based practice project. The student will create a scholarly document. Prerequisite: A research course and two informatics courses, or consent of instructor.

### IPHI 861. Introduction to Telehealth Policy and Practice. 3 Credits.

Course focus is on telehealth concepts and skills development with emphasis on historical aspects, priority areas, an introduction to policy, and equitable access to care. Evolving telehealth services including telemedicine, e-health, mobile health, and telemonitoring are introduced. This course aligns with the accreditation competencies set by health professions, population health and clinical practice programs, and telehealth best practices established by state and national agencies and experts in the field.

### IPHI 862. Developing Telehealth Programs. 3 Credits.

Course focus is on telehealth concepts and skills development with emphasis on needs assessment frameworks, service delivery models, financial models, and process flows. Evaluation and quality improvement models are introduced and applied to aid in planning, training, and preparing staff and the patient for telehealth services. Policy and reimbursement guidelines will be used throughout to determine service types and plan for sustainability. This course aligns with the accreditation competencies set by health professions, population health and clinical practice programs, and telehealth best practices established by state and national agencies and experts in the field. Prerequisite: IPHI 861: Introduction to Telehealth Policy and Practice or consent of instructor.

### IPHI 863. Applications of Telehealth Methods and Models. 3 Credits.

Course focus is on telehealth concepts and skills development with emphasis on best practices for building a telehealth program. Program improvement and sustainability concepts will be applied to address

current service needs, adapt to future practice, and identify gaps to ensure equitable access to telehealth services. This course aligns with the accreditation competencies set by health professions, population health and clinical practice programs, and telehealth best practices established by state and national agencies and experts in the field. Prerequisite: IPHI 861-Introduction to Telehealth Policy & Practice and IPHI 862-Developing Telehealth Programs or consent of instructor.

**IPHI 957. Health Informatics, Human Factors, and Ergonomics as Applied to Patient Safety. 3 Credits.**

The use of information systems including medical devices is paramount in achieving patient safety. Students will attain an inclusive understanding of how human factors and ergonomic principles can be used to improve patient safety in the design, implementation, and evaluation of information systems and medical devices. Additionally, healthcare professionals will acquire skills to appropriately apply error reduction strategies developed in high reliability organizations. KU DNP students may count this course as 2 credit hours of lecture and 1 credit hour of practicum.

**IPHI 958. Knowledge Representation and Interoperability. 3 Credits.**

The need to exchange clinical information consistently between healthcare providers, care settings, researchers, and others requires syntactic and semantic interoperability. Requirements and approaches to meet interoperability will be explored. Standards for messaging, terminology, and knowledge representation will be investigated. KU DNP students may count this course as 2 credit hours of lecture and 1 credit hour of practicum.

## Graduate Studies Medical Ctr Courses

**GSMC 50. Science Special Studies. 0 Credits.**

The aim of this course is to teach the methodologies and skills required for conducting biomedical science research, or practice in a clinical setting. The learning experience will be tailored to individual needs with personalized instruction for the opportunity to learn new skills and competencies, or exposure to new research developments or clinical practice. Progress of the student will be monitored through weekly laboratory meetings with members of the research lab or weekly contact with the student and/or clinical instructor in the clinical setting. The students will self-assess their progress and receive constructive feedback from appropriate individuals in the lab or clinical setting. Prerequisite: Permission of instructor in the Office of International Programs.

**GSMC 99. Postdoctoral Studies. 0 Credits.**

Postdoctoral Studies

**GSMC 501. Foundations of Interprofessional Collaboration I: Introduction to Interprofessional Collaboration. 0 Credits.**

This course will introduce interprofessional students to the basic concepts of interprofessional collaboration including values and ethics, roles and responsibilities of healthcare team members, and interprofessional communication tools using the evidence-based national curriculum of TeamSTEPPS.

**GSMC 502. Foundations of Interprofessional Collaboration II: Application Interprofessional Collaboration. 0 Credits.**

This course will provide interprofessional students' opportunities to apply key knowledge and skills gained in FIPC I, through role-plays and case-based learning. Students will apply their knowledge of roles and responsibilities of healthcare team members and interprofessional communication tools and continue learning with, from, and about students from other professions.

**GSMC 503. Foundations of Interprofessional Collaboration III: Demonstration Interprofessional Collaboration. 0 Credits.**

This course will provide interprofessional students' opportunities to demonstrate key knowledge and skills gained in FIPC I and II, through simulation. Students will demonstrate their interprofessional communication skills, including specific opportunities to utilize TeamSTEPPS tools. Students will also demonstrate their teamwork abilities by working with interprofessional students during the simulation.

**GSMC 803. Introduction to Clinical Research. 1 Credits.**

Course will provide a comprehensive overview to clinical research. The student will gain an understanding of how to develop clinical research questions including protocol design and the factors that should be considered in initiating a clinical research study. This will include biostatistical considerations, the recruitment of study participants, regulatory issues, and data management, and defining measures and instruments. Students will gain knowledge of how to define clinical research among the various institutional entities involved with clinical research at the University of Kansas Medical Center such as the Research Institute (RI), General Clinical Research Center (GCRC) and the Human Subjects Committee (HSC). Additionally, one component of the course will focus on how to apply for funding (grantsmanship), critical appraisal of research studies, and how to present research data. Prerequisite: Consent of Instructor.

**GSMC 840. CLINICAL OBSERVATION IN HEALTH CARE FOR BIOENGINEERS. 3 Credits.**

This course requires a 6 hour time commitment each week over the semester. During each weekly session the student will observe various medical practitioners in specific health care environments. The course gives the bioengineer an opportunity to see the inside of medical practice and exposes students to medical questions and challenges that could provide opportunities for engineers to contribute to the improvement of medical practice. Each student must select a concentration for this course from a health care specialty depending on availability. Some specialty options might include: Orthopedic, Radiology, Cardiology, Physical Therapy, etc. Grading will be pass/fail based on participation and journal keeping. Prerequisite: Graduate engineering standing, Consent of instructor.

**GSMC 850. Proteins and Metabolism. 2 Credits.**

This course is the first of four lecture units in the first year curriculum of the Interdisciplinary Graduate Program in the Biomedical Sciences. It will cover basic principles of metabolism, protein structure and an introduction to nucleic acids. Prerequisite: Permission of instructor. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 852 (Introduction to Biomedical Research).

**GSMC 851. Molecular Genetics. 2 Credits.**

This course is the second of four lecture units in the first year curriculum of the Interdisciplinary Graduate Program in the Biomedical Sciences. It will cover basic principles of molecular genetics, DNA replication, DNA repair, transcription and translation. Prerequisite: Permission of instructor. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 852 (Introduction to Biomedical Research).

**GSMC 852. Introduction to Biomedical Research I. 2 Credits.**

This is the first semester of a one year series in the Interdisciplinary Graduate Program in the Biomedical Sciences. The course is composed of weekly meetings to discuss research problems, methods and current literature. The course will interface with the lectures and students will learn to critically evaluate our scientific knowledge base. The students will be introduced to the tools that are available to obtain and evaluate information. The students will be challenged to identify areas of our scientific knowledge that require further experimentation and clarification.

Prerequisite: Permission of instructor. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 850 (Proteins and Metabolism) and GSMC 851 (Molecular Genetics).

**GSMC 853. Cellular Structure. 2 Credits.**

This course is the third of four lecture units in the first year curriculum of the Interdisciplinary Graduate Program in the Biomedical Sciences. It will cover basic principles of cellular structure and function. Topics include the lipid bilayer, membrane proteins, and cellular organelles. Prerequisite: Permission of instructor. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 855 (Introduction to Biomedical Research).

**GSMC 854. Cell Communication. 2 Credits.**

This course is the fourth of four lecture units in the first year curriculum of the Interdisciplinary Graduate Program in the Biomedical Sciences. It will cover basic principles of cell communication. Topics include G-protein-coupled signaling, cellular cytoskeleton; cell cycle control; cell death; extracellular matrix; and cancer. Prerequisite: Permission of instructor. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 855 (Introduction to Biomedical Research).

**GSMC 855. Introduction to Biomedical Research II. 2 Credits.**

This is the second semester of a one year series in the Interdisciplinary Graduate Program in the Biomedical Sciences. The course is composed of weekly meetings to discuss research problems, methods and current literature. The course will interface with the lectures and students will learn to critically evaluate our scientific knowledge base. The students will be introduced to the tools that are available to obtain and evaluate information. The students will be challenged to identify areas of our scientific knowledge that require further experimentation and clarification. Prerequisite: Permission of instructor. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 853 (Cellular Structure) and GSMC 854 (Cell Communication).

**GSMC 856. Introduction to Research Ethics. 1 Credits.**

The objective of this course is to introduce students to research ethics. Students will learn and discuss some of the following areas of ethics in research: 1) sources of errors in science, 2) Scientific Fraud, 3) plagiarism and misrepresentation, 4) conflicts of interest, and 5) confidentiality. Prerequisite: Permission of instructor. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences.

**GSMC 857. Biographics. 1 Credits.**

The objective of the course is to teach students how to organize and present data in a clear and concise manner at national meetings. Students are taught basic principles of organizing data for presentation and then learn through the actual presentation of data in simulated platform sessions held in the course. Videotapes are made of the presentations, and students are then given a constructive critique of their presentation by the instructor and fellow students. Prerequisite: Permission of instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences.

**GSMC 858. Introduction to Faculty Research. 1 Credits.**

This course was created to provide students with sufficient introduction to the research conducted at KUMC. To facilitate this point, the course is designed as a seminar series. In each session of the series, three faculty members present a brief 20-minute overview of their research programs. The series will help students to select faculty for research rotations and ultimately help them determine which faculty member they will select as a research adviser for their doctoral research. Prerequisite: Permission of

instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences.

**GSMC 859. Research Rotations. 1-4 Credits.**

The course will introduce students to research methods, experimental design, and the types of biomedical research conducted at KUMC. The first research rotation begins halfway through the first semester; the second and third research rotations will occur in the second semester. It is designed to help students determine which faculty member they will select as a research adviser for their doctoral research. Prerequisite: Permission of instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences.

**GSMC 860. Introduction to Molecular Medicine. 1 Credits.**

Introduction to Molecular Medicine (1 credit hour/semester) is a two semester course, taught every fall and spring semester, primarily for first year MD-PhD students. This course is taught by the Director of the MD-PhD Program, with contributions from other faculty from the basic science and clinical departments. Through lectures, small group discussion, evaluation of primary literature, analysis of scientific data and presentations/discussions with current KUMC faculty, students will be introduced to the process of investigating the molecular and cellular derangements that underlie human disease. Order of topics mirror, to some extent, the subjects of the first-year modules. There will be particular emphasis on the diverse research methods and models systems used to investigate the molecular basis of disease and understanding how such investigations can be translated to answer clinically relevant questions. Students are evaluated by both group activity and individual preparation and participation. Prerequisite: Enrollment in the MD-PhD Program or Permission of Instructor.

**GSMC 861. Summer Research Rotation. 3 Credits.**

The course will introduce students to research methods, experimental design, and the types of biomedical research conducted at KUMC. This course is designed to help students determine which faculty member they will select as a research adviser for their doctoral research. This course is offered during the Summer semester only. Prerequisite: Permission of instructors. Students must be admitted into the Interdisciplinary Graduate Program in Biomedical Sciences.