Biomedical and Health Information Sciences (BHIS)

Courses

BHIS 405. Medical Sciences and Human Pathophysiology. 3 hours.
Introduction of fundamental concepts in pathophysiology. Specific disorders of major organ systems including etiology, manifestations, diagnostic tests, treatment modalities, pharmacotherapy and complications. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught fully online. Students must have an active UIC NetID with valid password and access to a computer and the Internet. Prerequisite(s): Grade of C or better in KN 251 and Grade of C or better in KN 252; or Grade of C or better in KN 253 and Grade of C or better in KN 254; or consent of the instructor.

BHIS 406. Medical Terminology for Health Information Management. 2 hours.
An Introduction to medical terminology and pharmacology, necessary to understanding the use of clinical vocabularies and classification systems in health information systems. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught fully online. Students must have an active UIC NetID with valid password and access to a computer and the Internet. Restricted to students in the Department of Biomedical and Health Information Sciences or consent of the Instructor.

BHIS 410. Health Data Structures and Management. 3 hours.
Data structures in clinical information systems, including database design and management, networking and security. Emphasis on "intrapreneurial" skills required to solve organizational information management problems. Course Information: Prerequisite(s): BHIS 460 and BHIS 461 and BHIS 480.

BHIS 428. Consumer Health: Engaging Patients Through Technology. 3 hours.
Provides an opportunity to apply patient engagement frameworks through mixed method assessment of health information accessed using health information technology. Course Information: Extensive computer use required. Extensive computer use required. Course is offered over 16 weeks for undergraduate students.

BHIS 433. Principles of Evidence-Based Health Care. 2 hours.
Qualitative and quantitative assessment of human subject clinical research: locating, evaluating, comparing scientific papers as bases for health care education and practice. Course Information: Same as MHPE 433. Prerequisite(s): Graduate or professional standing and approval of the school.

BHIS 437. Health Care Data. 3 hours.
Review of data types in a health care information system. How data is transformed into information and then again transformed into knowledge through integrated computer systems. Course Information: Taught online only. A UIC netid is required. Prerequisite(s): Graduate standing or consent of the instructor.

BHIS 460. Introduction to Health Informatics. 1 hour.
Introduction to information technology and systems in a healthcare setting. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught online. Students must have an active UIC NetID with valid password and access to a computer and the Internet. Prerequisite(s): Credit or concurrent registration in HIM 410 or equivalent experience. Students should demonstrate basic computing skills including knowledge of an office productivity suite (MS Office or other), electronic mail, and Internet browsers. Recommended background: IDS 200 or the equivalent.

BHIS 461. Information Systems for Health Information Management. 2 hours.
Advanced topics in information technology and systems in a health care setting; collection, analysis and management of health care data; special issues related to the role of health information administrators. Course Information: Extensive computer use required. Prerequisite(s): IDS 200 and credit or concurrent registration in BHIS 460. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture-Discussion.

BHIS 480. Management and Business Practices. 3 hours.
Principles of management with emphasis on business functions, procedures, and organizational structure as applied to various health care settings including private and institutional practice. Course Information: Prerequisite(s): Advanced undergraduate or graduate standing in the Department of Biomedical and Health Information Sciences or consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Lecture-Discussion and one Lecture.

BHIS 499. Information Sources in Biomedical & Health Information Sciences. 1 hour.
Prepares students to locate, interpret and evaluate pertinent research information sources. Course Information: Meets eight weeks of the semester. Extensive computer use required. Taught fully online. Students must have an active UIC netid with valid password and access to a computer and the internet. Prerequisite(s): Junior standing or above required; or consent of the instructor.

BHIS 500. Strategic Inquiry in Biomedical and Health Information Sciences. 3 hours.
Overview of research methods for BHIS, IRB, research ethics, and development of a pre-proposal including thesis statement, project question, background and justification. Course Information: Meets eight weeks of the semester. Extensive computer use required. Taught fully online (HI) or blended (BVIS). Students must have an active UIC netid with valid password and access to a computer and the internet. Prerequisite(s): BHIS 499.

BHIS 501. Methods in Biomedical and Health Informatics I. 4 hours.
First in two course series. Provides foundational knowledge of the methods, language, and technology in biomedical and health informatics research, including an exploration of their benefits and challenges in use. Course Information: Extensive computer use required. Prerequisite(s): Basic familiarity with Python programming language.

BHIS 502. Methods in Biomedical and Health Informatics II. 4 hours.
Continues BHIS 501. Second in a two course series providing foundational knowledge of the methods, language, and technology in biomedical and health informatics research, including an exploration of their benefits and challenges in use. Course Information: Extensive computer use required. Prerequisite(s): Grade B or better in BHIS 501.

BHIS 503. Communication Skills in Health Informatics. 3 hours.
An application course in which students assess and practice effective written and oral methods of communication skills necessary for health informatics professionals. Course Information: Prerequisite(s): Consent of the instructor.

BHIS 504. Qualitative Methods and Health IT Evaluation. 3 hours.
Qualitative research methods to accounts for the collection and analysis of consumer health data where quantitative methods are not sufficient to assess and evaluate health information technology. Course Information: Meets eight weeks of the semester. Online Course for 8 weeks. Prerequisite(s): BHIS 510; or consent of the instructor. Recommended background: BHIS 528 and BHIS 522.

BHIS 505. Ethics and Legal Issues in Health Informatics. 3 hours.
Examination of the legal and ethical issues involved in computerized health information systems. Course Information: Taught online only. A UIC netid is required. Prerequisite(s): Consent of the instructor.

BHIS 506. Health Information Technology Evaluation. 3 hours.
This applications course provides an opportunity for students to apply health information technology evaluation methods learned in BHIS 502. Course Information: Extensive computer use required. Meets eight weeks of the semester. Prerequisite(s): Grade of B or better in BHIS 502.

BHIS 507. Literature Reviews and Evidence Synthesis in Health Informatics. 3 hours.
Students will acquire advanced knowledge and critical skills that are important for designing, conducting, and publishing various types of literature reviews in biomedical and health informatics. Course Information: Extensive computer use required. Prerequisite(s): BHIS 499; or consent of the instructor.

BHIS 508. Q Research Methodology – Qualitative Research. 3 hours.
An in depth study of the basic principles and application of Q methodology as a research and analytical tool. Course Information: This is an online course. Prerequisite(s): Consent of the instructor. Recommended Background: BHIS students must have successfully completed BHIS 499.

BHIS 509. Informatics for the Clinical Investigator. 3 hours.
This course provides the foundation of requisite knowledge of computer and healthcare information sciences for the clinical investigator. Course Information: Extensive computer use required. Taught only online. A UIC netid is required. Prerequisite(s): Consent of the instructor.

BHIS 510. Informatics and Population Health. 3 hours.
Examination and assessment of various health information technologies used by health care organizations through lectures, readings, case study analysis and class discussion. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught online only. A UIC netid is required. Prerequisite(s): Graduate standing and consent of the instructor.

BHIS 511. Application of Health Care Information Systems. 2 hours.
Knowledge and experience with a variety of healthcare applications utilizing current information technology and systems implemented in healthcare provider organizations. Course Information: This is an online course. Prerequisite(s): BHIS 510 or consent of the instructor.

BHIS 514. Patient Safety Topics in Health Informatics. 2 hours.
The application of health informatics knowledge to the issue of patient safety. Course Information: Extensive computer use required. Prerequisite(s): BHIS 510 and BHIS 511; or consent of the instructor. Recommended background: Students should have completed at least one semester of Health Informatics courses in the Health Informatics program curriculum in order to have sufficient knowledge to frame patient safety as a health informatics issue; approximately 10 credit hours earned. Online IBHE Postmaster's Certificate in Health Informatics students may take the course as an additional elective, but not as a substitute for the courses in the curriculum. Students in other colleges and programs require consent of the instructor.

BHIS 515. Management of Health Care Communication Systems. 3 hours.
Examination and management of data communications in and between health care facilities including examination of issues, standards, technologies, and system configurations. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught online only. Prerequisite(s): BHIS 510; and graduate standing and consent of the instructor.

BHIS 517. Healthcare Data Security and Cybersecurity Foundations. 3 hours.
Health information security methods and technology to achieve it; stresses risk assessment, pre-emptive action and non-technical security approaches. Outlines security policies and procedures; introduces foundational cybersecurity concepts. Course Information: Taught only online. A UIC netid is required. Prerequisite(s): BHIS 437 and BHIS 510 or consent of the instructor.

BHIS 520. Health Information Systems Analysis and Design. 3 hours.
A project course applying systems analysis and design theory to health care systems evaluation, modeling and implementation. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught online only. A UIC netid is required. Prerequisite(s): BHIS 510; and graduate standing and consent of the instructor.

BHIS 521. Process Innovation with Health Information Technology. 3 hours.
Examines how process and quality are affected through the implementation of new technology and how health care delivery can be changed through innovations of key processes with technology as the enabler. Course Information: Extensive computer use required. Prerequisite(s): BHIS 520; and consent of the instructor.

BHIS 522. Mobile Health Informatics. 3 hours.
Examines the field of mobile health informatics from theoretical and applied information technology and management perspectives. Course Information: Meets eight weeks of the semester. Extensive computer use required. Offered completely online. Some synchronous group interactions may be required. Prerequisite(s): Grade of B or better in BHIS 437, BHIS 510, and BHIS 515; or consent of the instructor. Recommended background: BHIS 528 or the equivalent. Students will be expected to apply critical and abstract thinking skills; possess academic and/or professional experience translating clinical practices, requirements and/or workflows to healthcare information technologies, possess comprehension of the current healthcare regulatory structure and environment. Students in other colleges or programs require consent of the instructor.

BHIS 523. Digital Health and Advanced Topics in Mobile Health Technologies. 3 hours.
Provide students with advanced knowledge and skills for designing, implementing, and evaluating health solutions. Students will be taught concepts of user-centered design as a framework for designing, developing, and evaluating health technologies. Course Information: Extensive computer use required. Meets eight weeks of the semester. Prerequisite(s): BHIS 522. Recommended background: BHIS 528. Restricted to students in the Department of Biomedical and Health Information Sciences or consent of instructor.

BHIS 525. Social and Organizational Issues in Health Informatics. 3 hours.
Examines the impact of information systems on the health care organization and applies theory through case study analysis. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught only on-line. A UIC netid is required. Prerequisite(s): BHIS 510; and BHIS 515 or BHIS 520 or BHIS 530; or consent of the instructor.

BHIS 527. Knowledge Management in Healthcare Organizations. 3 hours.
An examination, through readings, case studies, research publications, and discussion, of the current issues, concepts, and technologies of Knowledge Management in Healthcare Organizations. Course Information: Extensive computer use required. May be offered online, using synchronous and asynchronous discussion, in conjunction with seminar format. Prerequisite(s): Grade of B or better in BHIS 510; and consent of the instructor.

BHIS 528. Consumer Health Informatics. 3 hours.
Examines the developing area of consumer health informatics from both theoretical and practical knowledge management perspectives through class discussions. Course Information: Prerequisite(s): BHIS 510 or consent of the instructor. Recommended background: BHIS 505.

BHIS 529. Transforming Healthcare using Business Intelligence and Predictive Analytics. 3 hours.
An examination, through readings and class discussion, of various health data and information technologies and capabilities required by healthcare organizations as they undergo the major transformations needed to support emerging care models. Course Information: Extensive computer use required. Meets eight weeks of the semester. Prerequisite(s): Grade of B or better in BHIS 510 and Grade of B or better in BHIS 437; and consent of the instructor. Recommended background: BHIS 525.

BHIS 530. Topics in Health Informatics. 3 hours.
Current theories and methods in health informatics. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught online only. A UIC netid is required. Prerequisite(s): BHIS 510; and BHIS 515 or BHIS 520 or BHIS 525; and graduate standing and consent of the instructor.

BHIS 531. Health Information Technology and Informatics in Interprofessional Collaborative Practice. 3 hours.
Foundations of knowledge, skills, and attitudes among the health professions, identifying implications to support patient-centered health care delivery teams through informatics. Course Information: Extensive computer use required.

BHIS 532. Foundations of Clinical Decision Support Systems. 3 hours.
An examination of foundational concepts of clinical decision support systems, an area that utilizes both biomedical and computer sciences to enhance effectiveness of the clinical decision making process. Course Information: Extensive computer use required. Taught online. Prerequisite(s): BHIS 437, BHIS 499, BHIS 503, Grade of B or higher in BHIS 510; or consent of instructor. Recommended background: BHIS 520. Priority will be given to students in the MS Health Informatics program. Other students may enroll with consent of instructor.

BHIS 533. Practical Implementation of Clinical Decision Support Systems. 3 hours.
A practical application of CDSS concepts in which students plan, design, and implement course CDSS projects intended for patient care settings. Course Information: Extensive computer use required. Taught online. Prerequisite(s): BHIS 437, BHIS 499, BHIS 503, Grade of B or higher in BHIS 510, and BHIS 532; or consent of instructor. Recommended background: BHIS 520. Priority will be given to students in the MS Health Informatics program. Other students may enroll with consent of instructor.

BHIS 534. Health Information Technology and Patient Safety. 3 hours.
Provides an analytical examination of health information technology and its implications to patient safety with the purpose to improve the performance of health professionals and enhance patient safety. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught online.

BHIS 535. Organizational Dynamics and Health Informatics. 3 hours.
Explores the dynamic relationships within an organization that influence the realization of value from investments in health information technologies. Course Information: Extensive computer use required. Meets eight weeks of the semester. Taught online. Prerequisite(s): BHIS 525; or consent of the instructor.

BHIS 537. Health Informatics Product Management. 3 hours.
Examines the environment and activities necessary to plan product development and management for the healthcare I.T. industry. Course Information: Prerequisite(s): Consent of the instructor. Recommended Background: BHIS 543.

BHIS 538. Healthcare Leadership and Digital Health Strategy. 3 hours.
Learn methods, skills and concepts needed to develop a digital health strategy. Course Information: Extensive computer use required. Meets eight weeks of the semester. Prerequisite(s): BHIS 510; or consent of the instructor. Recommended background: BHIS 537.

BHIS 540. Essentials of Health Data Science. 3 hours.
Provides foundation in data science applied specifically to healthcare. Competencies addressed include data science fundamentals: identifying data sources, integrating data sets, using data to drive strategic plans, planning analytics projects. Course Information: Extensive computer use required. Meets eight weeks of the semester. Course includes data analysis exercises. Taught online. Prerequisite(s): BHIS 529 and BHIS 575.

BHIS 541. Health Data Analytics. 3 hours.
Explores the spectrum of data analytics used in healthcare. Students complete exercises to design datasets, interpret and articulate data results needed to transform healthcare delivery and the health of individuals and populations. Course Information: Extensive computer use required. Meets eight weeks of the semester. Course includes data analysis exercises. Taught online. Prerequisite(s): BHIS 540. Corequisite(s): Some familiarity with computer programming recommended, but not required. 1) Programming fundamentals in the real world. https://www.lynda.com/Python-tutorials/Programming-Fundamentals-Real-World/418249-2.html 2) Up and Running with Python. https://www.lynda.com/Python-tutorials/Up-Running-Python/122467-2.html 3) Introduction to Data analysis with Python. https://www.lynda.com/Numpy-tutorials/Introduction-Data-Analysis-Python/419162-2.html.

BHIS 542. Artificial Intelligence. 3 hours.
Introduction to artificial intelligence and its application in healthcare. Competencies addressed include date exchange standards, supervised, unsupervised and fuzzy logic. Course Information: Meets eight weeks of the semester. Course includes data analysis exercises. Taught online. Prerequisite(s): BHIS 532 and BHIS 540 and BHIS 575; or consent of the instructor. Recommended background: Free online introductory course in Artificial Intelligence such as: Udacity – Intro to Machine Learning https://www.udacity.com/course/intro- to-machine-learning--ud120.

BHIS 543. Health Care Project Management. 3 hours.
Introduces health industry workers to specific health care project management and methods that achieve outcomes in the health care organization; stresses project life-cycle as the primary approach; uses project management book of knowledge. Course Information: Extensive computer use required. Meets eight weeks of the semester. Prerequisite(s): BHIS 437 and BHIS 510 and BHIS 520 and BHIS 525; or consent of the instructor.

BHIS 546. Leadership Development in Health Informatics. 3 hours.
Students will analyze, evaluate and practice the competencies necessary for leadership unique to the health informatics profession. Course Information: Prerequisite(s): Consent of the instructor.

BHIS 554. Health Informatics Business Intelligence Tools and Application. 3 hours.
Provides students with core business intelligence concepts and fundamentals, applying them to create best practices through informed decision making. Course Information: Extensive computer use required. Meets eight weeks of the semester. Prerequisite(s): Grade of B or better in BHIS 510; and Grade of B or better in BHIS 437; or consent of the instructor. Recommended background: BHIS 527. Students may take the course as an additional elective, but not as a substitute for the courses in the curriculum. Other colleges/programs require instructor consent. Enrollment priority will be extended to students in the MS in Health Informatics.

BHIS 560. Health Care Systems and Personalized Medicine. 3 hours.
Provides an in-depth analysis of the promise and challenges to health care of linking genomics, proteomics, and other characterizations of pools of biological molecules. Course Information: Extensive computer use required. Prerequisite(s): Two semesters of college calculus.

BHIS 561. Programming for Health Analytics. 3 hours.
This course introduces fundamental principles of programming for data science using a popular language like Python. Exposes students to basic programming techniques, data manipulation, and data analysis pertaining to healthcare data. Course Information: Extensive computer use required. Meets eight weeks of the semester. The course is taught online and uses lectures, discussion and data analysis exercises. Prerequisite(s): BHIS 437 and BHIS 529; and consent of the instructor. Recommended Background: Some familiarity with computer programming recommended , but not required. •.

BHIS 567. Healthcare Data Visualization. 3 hours.
This course introduces fundamental principles of data visualization in healthcare and focuses on effective presentation of health analytics outcomes. Course Information: Prerequisite(s): BHIS 437 and BHIS 575; and consent of the instructor. Recommended Background: BHIS 529 and BHIS 554 • Understanding Data Science https://www.lynda.com/Business-Skills-tutorials/Understanding-Data-Science/477452-2.html • Introduction to Data Science https://www.lynda.com/Big-Data-tutorials/Introduction-Data-Science/420305-2.html. Credit is not given for BHIS 567 if the student has credit in IDS 567.

BHIS 570. Human Factors and Cognition in Health Information Technology. 3 hours.
Provides an overview of human factors, human-computer interaction, and computer supported cooperative work and their implications to collaborative practice and the design and use of health information technology. Course Information: Extensive computer use required. Prerequisite(s): Grade of B or better in BHIS 502 or consent of the instructor.

BHIS 575. Applied Statistics for Health Data Science. 3 hours.
Presents statistical foundations for health data science using statistical software like R and Minitab. The course also provides exposure to common statistical techniques, and interpretation, focusing on health care data. Course Information: Credit is not given for BHIS 575 if the student has credit in IDS 570 or IDS 575. Extensive computer use required. Meets eight weeks of the semester. This course is taught online.

BHIS 580. Practicum in Health Informatics. 3 hours.
Field experience under supervision of a professional expert in a health informatics setting that is consistent with the student's area of study and career goals. Course Information: May be repeated. Prerequisite(s): Consent of the instructor.

BHIS 591. Research Rotations in Biomedical and Health Informatics. 1 hour.
First year PhD students in the biomedical and health informatics program will undertake research projects in laboratories affiliated with this program. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 2 hours. Students will register for two, six-week sections to be taken during a summer session or sessions. Extensive computer use required.

BHIS 592. Colloquium in Biomedical and Health Informatics. 1 hour.
Provides opportunities to interact with faculty and the research literature in biomedical and health information sciences. Collateral skill development includes advanced information literacy, scientific writing and presentations. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated to a maximum of 3 hours. Meets eight weeks of the semester. This is an 8-week course in which course content is delivered in a blended learning environment using a combination of on-campus discussion and on-line content.

BHIS 593. Health Informatics Capstone Experience. 1 hour.
Students demonstrate a mastery of health informatics knowledge concepts and skills, including theoretical synthesis, integration with practice, and critical evaluation. Course Information: Satisfactory/ Unsatisfactory grading only. Extensive computer use required. Meets eight weeks of the semester. Capstone Experience may be completed face-to-face or on-line. Students wishing to complete the course face-to-face must inform the instructor by the end of the first week of class. Course to be taken the last semester before graduation. Only for students who start the program in or after Fall 2012. Prerequisite(s): Consent of the instructor and completion of all other MS in Health Informatics curriculum requirements.

BHIS 594. Special Topics in Biomedical and Health Information Sciences. 1-3 hours.
An in-depth study of a health informatics topic of importance selected by the faculty. Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor. Course Information: Extensive computer use required. Meets eight weeks of the semester.

BHIS 595. Seminar in Biomedical and Health Information Sciences. 1 hour.
Presentations by invited speakers, as well as student presentations for critique by faculty and peers. Course Information: Satisfactory/ Unsatisfactory grading only. May be repeated. Prerequisite(s): BHIS 499 and BHIS 500; and satisfactory completion of 1 hour of BHIS 597, BHIS 598, BVIS 597 or BVIS 598; and consent of the instructor.

BHIS 596. Independent Study. 1-4 hours.
For graduate students who wish to pursue independent study not related to their project/thesis research. Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor.

BHIS 597. Project Research in Biomedical and Health Information Sciences. 0-5 hours.
Independent investigation that draws upon the professional experience and knowledge synthesis of the student. Students investigate a topic/ problem in their field, write an article and deliver an oral presentation. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Prerequisite(s): BHIS 499 and BHIS 500; and consent of the instructor.

BHIS 598. Thesis Research in Biomedical and Health Information Sciences. 0-16 hours.
Independent research in one area of health informatics directed by a faculty member. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Students may register in more than one section per term. Prerequisite(s): BHIS 499 and BHIS 500; and consent of the instructor.

BHIS 599. Ph.D. Thesis Research. 0-16 hours.
Independent research by the student under the supervision of the thesis advisor. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. A minimum of 3 contact hours per registered credit hour per week on average. Extensive computer use required. Prerequisite(s): Consent of the instructor. Students must have passed the preliminary exam. Preliminary exam cannot be taken until all required and elective courses have been successfully completed with a minimum cumulative GPA of 3.0.