BIOMEDICAL INFORMATICS (BMI)

BMI 810 INTRODUCTION TO BIOMEDICAL INFORMATICS 3 Credit Hours
An introduction to the field of biomedical informatics. The historical development of the field and the current state of the art will be discussed. Issues related to bioinformatics, clinical informatics, and public health/population informatics will be discussed.
Prerequisite: Admitted to BMI program or permission of the instructor.
Typically Offered: FALL

BMI 825 INTRODUCTION TO R PROGRAMMING FOR BIOMEDICINE 3 Credit Hours
An introduction to R programming language and data manipulation methods for graduate students in health and biomedical fields who currently need support from others for complicated data processing and analysis. Major topics include basic concepts of R, data manipulation and processing, statistical analysis, graphical presentation, basic simulation, genomic databases retrieval, and commonly used R packages. Computations will be illustrated using R.
Prerequisite: Instructor permission, BIOS806/CPH506 or an equivalent introductory statistics course, basic understanding of computer programming.
Cross List: PAMM 825
Instructor: Weiwei Zhang, Ph.D.
Typically Offered: FALL/SPR

BMI 840 DATA STRUCTURES AND UTILITY OF THE ELECTRONIC HEALTH RECORD (EHR) WITHIN THE LEARNING HEALTH SYSTEM 3 Credit Hours
This course is designed to prepare the graduate student with training in computer science or clinical informatics to extract, standardize for interoperation and manage Electronic Health Records (EHR) data as a resource for research, quality improvement and public health. This course will explore informatics and data science topics examining the role of health care information systems (EHR) in the evolution of the Learning Healthcare System (LHS) in the US. The function, utility and structure of EHR datasets will be examined relative to their use in clinical care, the information architectures in which they reside, and the regulatory data standards and metadata systems that are required for interoperation and sharing within the LHS. The coursework will focus on the specifics of the Epic® EHR system deployed at Nebraska Medicine and other enterprise clinical datasets as well as US national data resources that are relevant to healthcare. Extraction and standardization of EHR datasets into networked repositories for research and public management will be examined. Details of the top-level ontologies mandated by research networks for interoperation will be presented and studied in research analytic use cases. SQL data management exercises exploring common problems in LHS data science will be required throughout and instructor review and dialogue regarding students exercises will ensure mastery of course material. Major topics to be covered include Learning Health System, EHR data architectures and standards, semantic interoperation, US Core Data for Interoperability, SNOMED CT, LOINC and RxNorm.
Prerequisite: Functional knowledge and skill with the use of SQL or another database programming language.
Typically Offered: FALL

BMI 850 SPECIAL TOPICS IN CLINICAL INFORMATICS 3 Credit Hours
An in-depth discussion of implementation science and clinical decision support sciences in health informatics. The focus is on the integrative knowledge of theory and applications in clinical informatics. Grading is based on reflections and course project.
Typically Offered: SPRING

BMI 860 INTRODUCTION TO APPLIED HEALTH INFORMATICS 3 Credit Hours
Health informatics is the interdisciplinary study of the collection, management, and use of patient and health services related data to improve the overall quality and effectiveness of healthcare. This course presents an introduction to the practice of informatics in the healthcare setting. Overarching topics include: the fundamental informatics framework, the role of informatics across the healthcare continuum, and a survey of health informatics applications
Typically Offered: FALL/SPR

BMI 896 RESEARCH OTHER THAN THESIS 1-9 Credit Hours
Student research that is clearly distinct from ongoing or planned thesis/dissertation work, or research/lab rotations preformed prior to selecting a permanent advisor or supervisor.
Prerequisite: Students must be BMI graduate student
Typically Offered: FALL/SP/SU

BMI 899 MASTERS THESIS 1-9 Credit Hours
Independent BMI research related to masters degree
Prerequisite: Must be masters BMI student
Typically Offered: FALL/SP/SU

BMI 970 SEMINAR - HEALTH INFORMATICS 1 Credit Hour
Student and faculty presentations on current research and topics in health informatics. The focus is on creating a venue for student and faculty health informatics researchers to present, discuss and receive constructive criticism on their research.
Prerequisite: Enrolled in the Biomedical Informatics graduate program, MSIA graduate program (Health informatics) or Bioinformatics, or by permission.
Typically Offered: FALL/SPR

BMI 998 SPECIAL TOPICS IN BIOMEDICAL BIOINFORMATICS 1-9 Credit Hours
SPECIAL TOPICS IN BIOMEDICAL BIOINFORMATICS
Typically Offered: FALL/SP/SU

BMI 999 DOCTORAL DISSERTATION 1-9 Credit Hours
Independent student research related to the PhD dissertation. This course may be utilized before or after successful completion of the comprehensive exam.
Prerequisite: Must be PhD student in BMI
Typically Offered: FALL/SP/SU