Department of Population and Quantitative Health Sciences

Health Informatics
Graduate Certificate Program

- 12 credit program (15 to show on transcript) that provides a foundation in clinical and health informatics that will complement a student's primary training, and count towards a future M.S. or Ph.D. in Biomedical and Health Informatics now in the approval process.
- Students must apply for admission to this graduate certificate program.
- Courses may be double-counted from a CWRU degree program to the certificate.

Core Courses (6 Credits)		Semester Offered
MPHP 532/HSMC 432	Introduction to Health Informatics	Fall
PQHS 416	Computing in Biomedical and Health Informatics	Spring

Electives (6 Credits)		Semester Offered
Select two courses from one academic interest domain:		
Some courses may have prerequisites		
Health Informatics Management Concentration (Health Care Professionals)		
EBME 473/SYBB 421	Fundamentals of Clinical Information System	Fall
CRSP 401	Introduction to Clinical Research**	Summer
PQHS 431	Statistical Methods I**	Fall
PQHS 471	Machine Learning & Data Mining	Spring
HSMC 420	Health Finance	Spring
HSMC 412	Lean Service Operations	Fall
HSMC 456	Health Policy and Management Decisions	Spring
Clinical Informatics Concentration (MPH/PhD PQHS Students)		
PQHS 515	Large Databases & Healthcare Analytics	Fall
PQHS 471	Machine Learning & Data Mining	Spring
EBME 473/SYBB 421	Fundamentals of Clinical Information Systems	Fall
CRSP 401	Introduction to Clinical Research**	Summer
PQHS 431	Statistical Methods I**	Fall
MPHP 405	Statistical Methods in Public Health**	Spring
MPHP 467	Comparative and Cost Effectiveness Research	Summer
PQHS 468	The Continual Improvement of Healthcare	Fall
Bioinformatics Concentration (MPH/PhD PQHS Students)		
PQHS 451	Data-Driven Introduction to Genomics and Human Health	Fall
PQHS 471	Machine Learning & Data Mining	Spring
EECS/SYBB 459	Bioinformatics for Systems Biology	Spring

**For domains with CRSP 401, PQHS 431, and/or MPHP 405, only one can count.

For more information about the Graduate Certificate:
Contact Nickalaus Koziura at nlk34@case.edu or 216.368.5957

School of Medicine

Case Western Reserve University

New for Spring 2018!

PQHS 416 - Computing in Biomedical and Health Informatics

- This course will be of interest to students and professionals who are interested in learning about biomedical and health informatics with a focus on computing topics such as Electronic Health Record Systems, Ontologies, Machine Learning, and Natural Language Processing

- This is a required course in the recently approved Graduate Certificate in Health Informatics. For more info about this 12-15 credit certificate (can double-count certain classes being used for a CWRU degree program towards the certificate), contact Nickalaus Koziura nlk34@case.edu

- Useful for those working (or planning on working) in the development, use, and deployment of informatics tools in their workplace

The goals of this course are to introduce students to the computational techniques and methods that underpin biomedical and health informatics applications and tools including clinical text processing, management of patient data, and Big Data analytics. The course will be organized with a combination of classroom teaching, guest lectures, and team-based class projects for practical, hands-on experience in implementation. This course will emphasize computation and systems design, and is appropriate for both students and working professionals interested in modern biomedical and health informatics.

FACULTY

Satya Sahoo, PhD; **David Kaelber**, MD, PhD
Department of Population and Quantitative Health Sciences
Phone: 216 368 0532
Email: satya.sahoo@case.edu or dkaelber@metrohealth.org

CLASSES

Schedule: January19 - April 27, 2018 (Friday, 2:30pm – 5:30pm)

Room: Wood Building (WG-73)

Computing in Biomedical Health Informatics
Department of Population and Quantitative Health Sciences
School of Medicine
Case Western Reserve University

Spring 2018 Syllabus

Instructor and contact info/office hours
Satya S. Sahoo, PhD (satya.sahoo@case.edu)
Associate Professor, Population and Quantitative Health Sciences

David Kaelber, MD, PhD, MPH, FAAP, FACP, FACMI (dkaelber@metrohealth.org)
Chief Medical Informatics Officer and Vice-President of Health Informatics
Clinical Informatics Fellowship Director, CWRU Clinical Informatics Fellowship Program
Director, Center for Health Informatics and Patient Engagement
Director, Center for Clinical Informatics Research and Education
Professor, Internal Medicine, Pediatrics, and Population Health and Quantitative Health Sciences
Case Western Reserve University

Office Hours: By Appointment

Teaching Assistant name and contact (if applicable)
TBD

Course Description

The goals of this course are to provide students with a survey of the computational technique that underpin biomedical and health informatics. The course will cover methods in computational system development, including biomedical terminologies, ontologies, natural language processing (NLP), logic, Electronic Health Record (EHR) system architecture as well as applications, Hadoop technology stack, and Apache Spark. This course is intended for students interested in learning the computational foundations of biomedical and health informatics. Students should have at least a bachelor of science level educational background and an understanding of the fields of biomedical and clinical/translational.

Recommended Texts
There is no required textbook for this course. Topic-specific reading material will be listed as part of the course work

Learning Objectives
- Understand the use of terminology systems in organizing data and information in biomedical health informatics
- Develop an understanding of core principles of natural language processing in biomedical and clinical text processing
- Understand the theory and applications of Electronic Health Record systems
- Introduction to Parallel and Distributed Computing for Big Data Analytics
- Introduction to formal logic and Semantic Web technologies

Course Format

Classroom lectures by course instructors and guest lecturers.

<u>Requirements and Grading Scale</u>
20%   Class Attendance and Participation
50%   Homework Assignments
30%   Final Project: Project Report, Class Presentation
POLICIES
Statement on disability
> Students with a disability—please make an appointment with the instructor to discuss your needs at the earliest convenience. The necessary adjustments will be provided to facilitate the learning experience. Additionally, please be in contact with the Coordinator of Disability Resources, Educational Services for Students (ESS). ESS is located in 470 Sears Building. The office phone number is 216-368-5230, and the website is: http://studentaffairs.case.edu/education/disability/policy.html

Attendance (Up to Instructor)
Students are expected to attend all classes.

Laptop and cell phone use
> Although having a laptop in class opens up new learning possibilities for students, it can be used in ways that are inappropriate. It is easy for your laptop to become a distraction to you and to those around you. **Laptops are to be used only when essential to the task at hand.** Please turn off or silence all cell/smart phones, tablets, and other electronic devices for the duration of the course. Inappropriate uses will be noted and may affect the final grade.

Academic integrity
> All forms of academic dishonesty including cheating, plagiarism, misrepresentation, and obstruction are violations of academic integrity standards. Cheating includes copying from another's work, falsifying problem solutions or laboratory reports, or using unauthorized sources, notes or computer programs. Plagiarism includes the presentation, without proper attribution, of another's words or ideas from printed or electronic sources. It is also plagiarism to submit, without the instructor's consent, an assignment in one class previously submitted in another. Misrepresentation includes forgery of official academic documents, the presentation of altered or falsified documents or testimony to a university office or official, taking an exam for another student, or lying about personal circumstances to postpone tests or assignments. Obstruction occurs when a student engages in unreasonable conduct that interferes with another's ability to conduct scholarly activity. Destroying a student's computer file, stealing a student's notebook, and stealing a book on reserve in the library are examples of obstruction. More information can be found at https://students.case.edu/handbook/policy/integrity.html and http://case.edu/gradstudies/media/caseedu/grad-studies/documents/SGS-Academic-Integrity-Policies-and-Rules.pdf.