Informatics is the management and processing of data from many different contexts, including information classification (ontologies), collection, storage, analysis, dissemination, etc. Such a wide view often combines the fields of computing (store, process, and model information), social science (interactions of users and presenting information in appropriate contexts), and statistics (analysis of information). Biomedical informatics (BMI) represents a wide range of information associated with the research and practice of medicine including: clinical informatics (information on patients for patient care), bioinformatics (from genomics to proteomics), public health informatics (information from the public sector - federal and state), clinical research informatics (de-identified repositories and databases that facilitate epidemiological research), etc.

In this course, we will explore various topics in biomedical informatics (BMI), examining the computing infrastructure. To set the background for the course, from the medical side, our focus will be on clinical and translational science (CTS)\(^1\), which involves research underway (clinical drug or patient-care studies), the translation of successful research results into the general community (a new medical treatment goes from clinical studies to health care providers), the translation back to the bench (based on additional information learned during the usage of the new medical treatment in the community), and so on. From the computing side, our focus will be on a wide variety of topics including: XML\(^2\) and its role in data standards (e.g., HL7\(^3\)) for BMI; XML and data sharing/database interoperability; security models for BMI; architectural alternatives for data repositories to support clinical research; collaboration solutions for CTS; and other topics that cross both computing and BMI and include: i2b2 (Informatics for Integrating Biology and the Bedside)\(^4\) and caBIG (cancer Biomedical Informatics Grid)\(^5\).

This course will also have a number of guest lectures on various topics, and to accommodate their schedule, some classes may meet in the late afternoon or early evening (5pm and onwards). In addition, students will work either alone or in teams on a course project related to BMI. Part of this course project will require the students to develop lecture material (identify selected readings and PowerPoint slides) that will be presented in the last third of the course.

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\(^2\) [http://www.w3.org/XML/](http://www.w3.org/XML/)

\(^3\) [http://www.hl7.org/](http://www.hl7.org/)

\(^4\) [https://www.i2b2.org/](https://www.i2b2.org/)