# **CMPUT 690 Electronic Health Record and Data Analysis**

### **Prerequisite**:

Must have graduate-level standing No background is assumed Knowledge of healthcare or of database management systems would be an asset

### **Course Description:**

This course introduces the fundamentals of data mining and lifts the veil over some misconceptions and capabilities of knowledge discovery today. The course will provide an introduction to knowledge discovery in databases and complex data repositories, and present basic concepts relevant to real data mining applications, as well as reveal important research issues germane to the knowledge discovery domain and advanced mining applications. The focus will be on health related applications. The course also provides a better knowledge of the issues related to collecting, storing, managing, accessing and using patient health data in electronic form. The course prepares students to understand and use electronic records in medical practice. The course covers various topics related to the management of electronic health records including the modeling of health data, efficient information retrieval, privacy and security concerns, the use of electronic health records in decision support and medical data analysis and data mining.

### **Learning Objectives:**

- Appreciate the importance of an electronic health record
- Understand the need for standards in coding and exchanging medical data
- Understand the significance of privacy preservation and security risks in the context of electronic health records and the issues with health data anonymization
- Get introduced to data warehousing and data mining in the context of health data

### **Instructors:**

Osmar Zaïane Office : Ath 352 Phone: 780 492 2860 Office Hours: By mutually agreed upon appointment

### **Class time and Classroom:**

Mondays 10:00 am to 11:50am Classroom: GSB 559 Additional one hour on-line discussions per week

#### **Required textbook:**

None

### **Evaluation:**

Student grading is based on the following:

- Homework assignments (30%)
- Group term project (35%)
- Midterm (25%)
- Class Participation (10%)

## **Course Outline:**

- Electronic Health record related topics:
  - Overview of the Electronic Health Record
  - Paper medical records
  - Coding and Data Standards
  - Ontologies
  - Data Entry at the point of Care
  - Privacy and Security of health records
  - Functions of EHR
  - Database management systems
  - Information retrieval
  - Database querying
  - Data warehousing
  - Information extraction from text data
  - Data anonymization
  - Canada Health Infoway
  - Data integration
  - Data Mining for health informatics
  - Consequences of bad data entry
- Data mining related topics
  - Data Exploration and Analysis
  - Association Analysis
  - Sequential Pattern Analysis
  - Classification and Prediction
  - Data Clustering
  - Contrast Sets
  - Outlier Detection
  - Data Warehousing