CMPT 318 - D100 Special Topics in Computing Science: Cybersecurity

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Calendar Objective/Description:
Special topics in computing science at the 300 level. Topics that are of current interest or are not covered in regular curriculum will be offered from time to time depending on availability of faculty and student interest.

Instructor's Objectives:
This course introduces cybersecurity concepts and discusses cyber intelligence and threat analysis methods in the context of Big Data analytics. Cyber situational analysis and anomaly detection based on probabilistic modeling will play a central role. This includes using the R language and software environment for statistical computing. Fundamental concepts and principles of cybersecurity risk assessment, intrusion detection and prevention, critical infrastructure protection and beyond will be discussed in detail.

Prerequisites:
CMPT 225. Additional prerequisites to be determined by the instructor subject to approval by the undergraduate program chair.

Topics:
- Probability theory
- Discrete Markov process modeling
- Time series analysis and forecasting
- Intrusion detection and prevention
- Anomaly detection methods
- Cyber risk assessment and mitigation
- Advanced persistent threats
- Blockchain technology

Grading:
The course has a midterm examination (worth 30% of the total grade), two tests (worth 20%), three graded assignments (worth 15%) and a term project organized as group project with a project report and presentation in class (worth 30%). There will also be two reading assignments and several tutorials. Class participation accounts for 5% of the total grade.

Recommended Books:
An Introduction to Statistical Learning: with Applications in R, Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani , Springer, 2017, 978-1461471370

Academic Honesty Statement:
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student
Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).