

CS 798 -042: Network Softwarization
(Short title: **Network Softwarization**)

Objectives:

This course is one of two companion courses on network softwarization offered simultaneously in the Winter 2020, the first course introduces concepts and principles of network softwarization while the second course (this one) focuses on hands on experience with softwarization technologies and enablers. The courses will be offered simultaneously in 4 Universities, namely University of Waterloo, University of Toronto, University Laval and École de technologie supérieure (ETS). Each lab session will be followed by a fifty-minute professional skills development session focusing on career professionalism, communication and presentation skills, teamwork, project management, entrepreneurship, and intellectual property rights among others.

Students must successfully complete both courses in order to qualify for CREATE industry internships in the area of network softwarization.

Schedule:

Friday 10:00 PM – 12:50 PM

Outline:

Part 1: Software-Defined Networking

- SDN data plane – Open vswitch & Mininet tutorial and lab. (Week 1)
- SDN control plane – ONOS tutorial and lab. (Week 2)
- SDN network virtualization – FlowVisor & OVX tutorial and lab. (Week 3)

Part 2: Cloud Computing, Network Function Virtualization and Orchestration

- Cloud Computing – OpenStack tutorial and lab. (Week 4)
- Programmable Networks – Introduction to SAVI. (Week 5)
- Network Function Virtualization – Containers & Orchestration. (Week 6)
- IoT, Smart Cities, and 5G Use Cases – IoT applications lab. (Week 7)

Part 3: Sustainable Management of Clouds and Networks

- Energy efficient and sustainable management – Green ICT tutorial. (Week 8)
- Data Analytics – Cloud workload classification/prediction lab. (Week 9)

Part 4: Software-Defined Optical WAN and Radio Access

- 5G Fronthaul – capacity of various optical network solutions. (Week 10)
- Elastic Optical Networks. (Week 11)

Grading scheme:

- Class Participation: 10%
- Lab Exercises: 40%
- Course project proposal: 10%
- Course Project: 30%
- Final project video presentation: 10%