Tentative Syllabus for SEG4300 Topics in Software Engineering (3, 0, 0)
Cloud Systems and Networks
Winter 2019

Professor:  Burak Kantarci, Ph.D, P.Eng, SMIEEE
Office: CBY-A516
www.site.uOttawa.ca/~bkantarc
E-mail: burak.kantarci@uOttawa.ca
Office Hours: Wednesday 12:00pm-2:00pm

Teaching Assistants:  Grader: TBD

Course Schedule:
LEC: LPR 285  Wed. 2:30pm-5:20pm

Class attendance is mandatory. As per academic regulations, students who do not attend 80% of the class will not be allowed to write the final examinations.

All components of the course must be fulfilled; otherwise students may receive an INC as a final mark (equivalent to an F).

Description
This course is an introduction to cloud computing systems and cloud networks. Three primary foci will be on software defined networks / network function virtualization, mobile cloud computing and software engineering approaches for inter-data-center networks. Topics will include: a thorough presentation of cloud computing service models, namely Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a Service (SaaS); detailed investigation of cloud management issues focusing on mobile cloud computing, cloud data center management and service provisioning; security and privacy in the cloud; and sustainability of cloud systems. An emphasis will be given on the design and analysis of cloudification of communication networks and the role of Software Defined Networking (SDN) and Network Function Virtualization (NFV) in the realization of wireless/mobile network systems.

Prerequisite:
SEG2105 Introduction to Software Engineering

Academic Integrity is expected from all students participating in this course and academic fraud will not be tolerated. All students should be familiar with the University of Ottawa Academic Integrity WEB site at http://web5.uottawa.ca/mcs-smc/academicintegrity/home.php

Course Objectives
By the end of the course, students will learn:

a. the principles of cloud computing service models
b. how to design cloud applications
c. how to maintain sustainability in cloud computing systems
d. how to meet security and privacy needs in cloud systems
e. cloudification in the next generation Internet
f. how to meet networking and communication challenges in cloud computing systems
g. application of software defined networks (SDN) and network function virtualization (NFV) concepts in wireless and mobile networks

Course Outline
- Cloud Concepts and Technologies
- Cloud Services and Platforms
- Hadoop and MapReduce Concepts
- Cloud Application Design
- Datacenter networking
  - Intra-datacenter networks
  - Inter-datacenter networks
- Software Defined Networks
- Network Function Virtualization
- Network as a Service
- Mobile Cloud Computing
- Big Data in the Cloud
- Cloud Security and Privacy

Text

Quizzes: You will be given 4 quizzes. Prior to every quiz, study material will be provided, and the quizzes will be covering the study material. Missed quizzes cannot be deferred.

Project: You will work in groups of three. The project will require research-oriented study. You will start working on the project in the 3rd week, and will submit the project in Week-11. Project presentations will take place in Week-11 and Week-12.

Note: Rules and regulations will be posted on the course website, as well as how to deal with late copies.

The mid-term exam is a closed book exam, covers material presented in the weeks prior to the mid-term. The mid-term schedule is to be announced (target date: 27 February).

The final exam is a closed book and will cover all material studied during the term.

Grading

<table>
<thead>
<tr>
<th></th>
<th>Term project</th>
<th>Quizzes</th>
<th>Midterm Examination</th>
<th>Final Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term project</td>
<td>30% (25% project + 5% presentation)</td>
<td>20% (5% + 5% + 5% + 5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quizzes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midterm Examination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Examination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>