DevOps Syllabus

This course will introduce you to the system side of DevOps. DevOps is an abbreviation for the interactions between Dev (development) and Ops (Operations).

DevOps consists of three interlocking strands – culture, organization, and software engineering. We are going to focus on the software engineering aspects of implementation of DevOps principles. The others are important, just not the focus of this course.

The course will be divided into two portions – theory and practice. The theory portion will be presented through short lectures on line. There will be a 10 minute quiz once each week. The quiz will be on the assigned lectures from the prior week. The assignments are all connected and are intended first to introduce you to the problems DevOps practices are intended to solve and secondly to give you experience with common tools used to solve those problems.

The bulk of each class meeting will be taken up by discussions of the prior week's lectures and the assignments.

Each student should track the following times – time spent coding, time spent designing, time spent using a particular tool, time spent learning about a particular tool, time spent coordinating with members of your team, time spent coordinating with members of other teams. This will be reported weekly.

The textbook for the course is: DevOps: A Software Architect's Perspective.

The grade will be determined 50% through exams on the theory – the 5 minute quizzes + an overall final at the end of the semester. 50% on the assignments. Assignments are due 9:00AM on the date specified. All files created as a portion of the assignments should be version controlled. One of the deliverables for every assignment is a list of steps to follow to achieve the deliverable.

Major topic	Date	Theory (watch video prior to date indicated)	Reading	Assignment
Background	Mon Class 1			Assignment 1 preliminaries – install Petclinic, VB and Ubuntu Due Sept 7
	Wed Class 2	1 What is DevOps	Textbook sections 1.1, 1.2, 2.2 Textbook chapter 3	
	Wed Class 3	2 Virtual Machine	https://en.wikipedia.org/wiki/Virtual_machine	Assignment 2 SSH
	Mon Class 4	3 Network	Textbook section 2.2 https://en.wikipedia.org/wiki/Port_(	

			computer_networking) https://en.wikipedia.org/wiki/Domain_Name_System https://en.wikipedia.org/wiki/IPv6 https://en.wikipedia.org/wiki/Secure_Shell	
Deployment pipeline	Wed Class 5	4 Intro to deployment pipeline	Textbook sections 5.1-5.3	Assignment 3 Vagrant
	Mon Class 6	5 roles and responsibilities	https://scs.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=c4df9f79-8f94-42b0-a3d4-018e9b6352bb https://ist.mit.edu/sites/default/files/about/org/roles/DevOps_Engineer_Position_Description_v4.pdf	
	Wed Class 7	6 Rafter – case study In configuration management	Textbook chapter 11 https://homes.cs.washington.edu/~mernst/advice/version-control.html	
	Mon Class 8	7 Development environment	Textbook section 5.4	Assignment 4 Jenkins
	Wed Class 9	8 Build environment	Textbook section 5.5	
	Mon Class 10	9 Staging environment	Textbook section 5.6	

	Wed Class 11	10 Production environment	Textbook section 5.7	Assignment 5 Ansible
	Mon Class 12	11 SourceD case study	Textbook chapter 12	
Architecture advanced packaging	Wed Class 13	12 Microservice architecture 1	Textbook chapter 4	
	Mon Class 14	13 Microservice architecture-2		Assignment 6 Docker
	Wed Class 15	14 Atlassian case study	Textbook chapter 13	
	Mon Class 16	15 Containers	https://docs.docker.com/engine/understanding-docker/ http://jasonwilder.com/blog/2014/10/13/a-simple-way-to-dockerize-applications/ http://hokstad.com/docker/patterns https://docs.docker.com/swarm/overview/ https://docs.docker.com/docker-hub/overview/	
Cloud	Wed Class 17	16 failure in the cloud	Textbook section 2.2	Assignment 7 EC2 Container
	Mon Class 18	17 distributed coordination	http://the-paper-trail.org/blog/consensus-protocols-paxos/http://www.slideshare.net/I	

			vanGlushkov/zookeeper-vs-consul-41882991	
	Wed Class 19	18 scalability	http://docs.aws.amazon.com/autoscaling/latest/userguide/WhatIsAutoScaling.html	
Deployment	Mon Class 20	19 deployment 1	Textbook chapter 6	
	Wed Class 21	20 deployment 2		Assignment 8 Ansible Vault
	Mon Class 22	21 deployment 3		
Security	Wed Class 23	22 basic security 23 Credential management	Textbook chapter 8 https://www.k2esec.com/network-security-protocols-ipsec-vs-tlsssl-vs-ssh-part-ii/ http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/UsingIAM.html	
	Mon Class 24	24 securing the network 25 Securing pipeline http://presentationtube.com/watch?v=9QNtcYjmn7T	https://ssrg.nicta.com.au/publications/nictaabstracts/8861.pdf	Assignment 9 Nagios
	Mon Class 25	26 Securing app		

Monitoring	Wed Class 26	27 monitoring 1	Textbook Chapter 7	
	Mon Class 27	28 monitoring 2		