Syllabus

Course Number: MSES 602
Course Title: Introduction to DevOps Engineering

Course Description:
Introduces the methodologies, tools, and insights of the DevOps process and what it can do for an organization. The course covers development, deployment and operations including infrastructure as code, continuous deployment, testing automation, validation, monitoring and security.

Prerequisite Courses:
None.

Course Overview
This course introduces the student to concepts and tools used to implement DevOps as a method for delivering systems to the enterprise with increased quality and velocity. This course identifies common issues in the development processes of systems and presents techniques to improve these processes through cross-organizational collaboration, shared responsibility, automated builds, testing, delivery, and monitoring. It offers students the opportunity to get hands-on experience with common tools used in the industry to bridge the gap between abstract concepts and practical skills.

Course Outcomes:
Upon completion of this course, learners should be able to:

- Demonstrate an understanding of the need for DevOps and the problems it solves.
- Demonstrate an understanding of the DevOps concepts and practices (including its relationship to Agile, Lean and IT Service Management (ITSM)).
- Be able to describe the role of workflows, communication and feedback loops.
- Be able to define critical success factors and key performance indicators.
- Apply DevOps concepts in an enterprise environment by automating processes using tools such as Ansible and scripting languages.
- Demonstrate an understanding of Continuous Integration and Delivery workflows. Apply CI/CD using tools such as Jenkins and Git.
- Describe the role of monitoring and the ways in which it helps IT and business succeed.
- Demonstrate how to apply tools used for monitoring, alerting, and reporting such as Splunk, AppDynamics, Nagios.
Course Materials:

Required Texts:


Required Resources:


**Technology Tools:**

To complete the course successfully, your computer should be capable of running virtualized operating systems using **VMware Workstation, VMware Fusion, or Oracle's VirtualBox software** and should meet the following specifications:

1. **CPU Capabilities** – A dual core 64 bit CPU, with four threads (Intel hyper-threading) is required. An Intel i5 or i7 type chip or the AMD equivalent is recommended.
2. **Computer Memory** – 8 GB of RAM required, 16 GB or more recommended.
3. **Disk** – 500 GB of disk space for your coursework is required. A Solid-state disk is recommended.
4. **Operating System** – A recent version of Windows or Apple OS X.
5. **Internet connection** – A broadband Internet connection is required such as provided by cable connections or DSL.

You must have administrative rights on your computer in order to install software.

**Optional Materials:**


Pre-Assignment:

All: Read “The Phoenix Project”

**Online Format:** Sign on to D2L (Home Page) and become familiar with the course navigation of the Web Curriculum. Read Chapter One of text.

**Classroom-based Format:** Week one readings. Instructor will make assignments.

Pre-Assignment Due Dates:

**Classroom-based Format:** This assignment is due the first night of class.

**Online Format:** The instructor will specify the due date for this assignment.

Course Assignments and Activities:

<table>
<thead>
<tr>
<th>Topics</th>
<th>Readings</th>
<th>Activities Assignments and Associated Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Automation</td>
<td>Mullick 2016 DevOps – Traditional and Modern Approaches</td>
<td>Written assignment: • The Phoenix Project</td>
</tr>
<tr>
<td>Chapter</td>
<td>Title</td>
<td>Bibliography</td>
</tr>
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</tbody>
</table>
| 5       | Software Architecture | Bass 2015 Chapter 2 – The Cloud as a Platform  
Bass 2015 Chapter 4 – Overall Architecture  
Bass 2015 Chapter 13 – Migrating to Microservices  
Henthorne-Iwane 2015 – Clout Orchestration Vs. DevOps Automation | Written Assignment:  
• Annotated Bibliography  
– 2 entries |
| 6       | Continuous Integration / Continuous Deployment | Bass 2015 Chapter 5 – Building and Testing  
Bass 2015 Chapter 6 – Deployment  
Bass 2015 Chapter 12 – Implementing a Continuous Deployment Pipeline for Enterprises  
Fowler 2006 Continuous Integration | Lab #3:  
• Introduction to Node JS (Tutorialworks)  
Written Assignment:  
• Annotated Bibliography  
– 2 entries |
| 7       | Continuous Integration – Part 2 | Free 2015 Automated Servers and Deployments with Ansible and Jenkins. | Lab #4:  
• Continuous Integration and Deployment using Jenkins and Ansible |
| 8       | Monitoring and Management | Bass 2015 Chapter 7 – Monitoring  
Bass 2015 Chapter 8 – Security and Security Audits  
Haines 2015 Top 5 Java performance metrics, tips & tricks | Lab #5:  
• Environment monitoring using modern tools  
Written Assignment:  
• Annotated Bibliography  
– 2 entries |

**CC&IS Grading Scale**

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93 to 100</td>
<td>4.00</td>
</tr>
<tr>
<td>A–</td>
<td>90 to less than 93</td>
<td>3.67</td>
</tr>
<tr>
<td>B+</td>
<td>87 to less than 90</td>
<td>3.33</td>
</tr>
<tr>
<td>B</td>
<td>83 to less than 87</td>
<td>3.00</td>
</tr>
<tr>
<td>B–</td>
<td>80 to less than 83</td>
<td>2.67</td>
</tr>
<tr>
<td>C+</td>
<td>77 to less than 80</td>
<td>2.33</td>
</tr>
<tr>
<td>C</td>
<td>73 to less than 77</td>
<td>2.00</td>
</tr>
<tr>
<td>C–</td>
<td>70 to less than 73</td>
<td>1.67</td>
</tr>
<tr>
<td>D+</td>
<td>67 to less than 70</td>
<td>1.33</td>
</tr>
<tr>
<td>D</td>
<td>63 to less than 67</td>
<td>1.00</td>
</tr>
<tr>
<td>D–</td>
<td>60 to less than 63</td>
<td>.67</td>
</tr>
<tr>
<td>F</td>
<td>Less than 60</td>
<td>0</td>
</tr>
</tbody>
</table>

Additional information about grading can be found in the latest edition of the University Catalog, available at [http://www.regis.edu/Academics/Course%20Catalog.aspx](http://www.regis.edu/Academics/Course%20Catalog.aspx).
CC&IS Policies and Procedures

Each of the following CC&IS Policies & Procedures is incorporated here by reference. Students are expected to review this information each term, and agree to the policies and procedures as identified here and specified in the latest edition of the University Catalog, available at http://www.regis.edu/Academics/Course%20Catalog.aspx or at the link provided.

- The CC&IS Academic Integrity Policy.
- The Student Honor Code and Student Standards of Conduct.
- Incomplete Grade Policy, Pass / No Pass Grades, Grade Reports.
- The Information Privacy policy and FERPA. For more information regarding FERPA, visit the U.S. Department of Education.
- The HIPPA policies for protected health information. The complete Regis University HIPAA Privacy & Security policy can be found here: http://www.regis.edu/About-Regis-University/University-Offices-and-Services/Auxiliary-Business/HIPAA.aspx.

The CC&IS Policies & Procedures Syllabus Addendum summarizes additional important policies including, Diversity, Equal Access, Disability Services, and Attendance & Participation that apply to every course offered by the College of Computer & Information Sciences at Regis University. A copy of the CC&IS Policies & Procedures Syllabus Addendum can be found here: https://in2.regis.edu/sites/ccis/policies/Repository/CCIS%20Syllabus%20Addendum.docx.