1 Course Description
Cloud computing promises significant cost savings via economies of scale that typically are not achievable by a single organization. These cost savings, as well as the inherent flexibility of resources, are the primary reasons many organizations are moving toward cloud computing. This course examines cloud computing in detail and introduces the security concerns associated with cloud computing. Key topics include service models for cloud computing, virtualization, storage, management, and data processing. Fundamental security principles are introduced and applied to cloud computing environments. The format of this course includes lectures and hands-on assignments. Students will complete a project and present it as part of the course.

2 Prerequisites
Operating Systems (EN.600.318, EN.600.418, or equivalent)

3 Instructor
Name  Joel Coffman
Office  Johns Hopkins University Applied Physics Laboratory
Phone  240 228-0544 or 443 778-0544 (office)
Email  joel.coffman@jhu.edu (preferred)
        joel.coffman@jhuapl.edu
Website  http://pages.jh.edu/~jcoffma2
Office Hours  By appointment

4 Meetings
Tuesdays and Thursdays, 4:30–5:45pm

5 Textbook
A variety of papers pertaining to cloud computing and cloud computing security will serve as the texts for the course.

6 Online Resources
Please log in to Blackboard for all materials related to this course.

7 Course Topics
- Introduction to cloud computing
- Cloud computing concepts and models
- Data centers
- Virtualization
- Virtualization security
- Introduction to information assurance (IA)
- Overview of cloud security
- Information leakage
- Side channels
- OpenStack and Amazon Web Services (AWS)
- Cloud management
- Secure computation
- Data storage
- Big data
- Data security / privacy
- MapReduce
8 Course Expectations & Grading
Students are expected to read the assigned material in preparation for each class. Quizzes review key material and emphasize its synthesis across the various topics covered throughout the course. There will be periodic assignments throughout the course to gain experience with the course topics. Students are also expected to research a topic pertaining to cloud computing and present their work to the class.

Final grades will be determined using the following weighting and standard grading scale—i.e.,

<table>
<thead>
<tr>
<th>Item</th>
<th>%</th>
<th>Grade</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>30</td>
<td>A</td>
<td>90–100</td>
</tr>
<tr>
<td>Final</td>
<td>20</td>
<td>B</td>
<td>80–89</td>
</tr>
<tr>
<td>Assignments</td>
<td>40</td>
<td>C</td>
<td>70–79</td>
</tr>
<tr>
<td>Participation</td>
<td>10</td>
<td>...</td>
<td>± may be applied at the discretion of the instructor.</td>
</tr>
</tbody>
</table>

Students may bring laptops or other computing devices to class as long as they are not distracting to other students. Smartphones may also be used during class with the aforementioned caveat. Students should also be aware that recent research suggests that smartphones may actually be detrimental to learning.¹

9 Ethics
The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

You can find more information about university misconduct policies on the web at these sites:
- Undergraduates: e-catalog.jhu.edu/undergrad-students/student-life-policies/
- Graduate students: e-catalog.jhu.edu/grad-students/graduate-specific-policies/

10 Students with Disabilities
Any student with a disability who may need accommodations in this class must obtain an accommodation letter from Student Disability Services, 385 Garland, (410) 516-4720, studentdisabilityservices@jhu.edu.