
Dr. Massimiliano Albanese, Department of Applied Information Technology

Fall 2013. Fridays, 4:30 pm - 07:10 pm, Nguyen Engineering Building 1110, Fairfax Campus

Office hours. By appointment

CATALOG DESCRIPTION

This course offers a survey of security and privacy issues in Cloud Computing systems, along with an overview of current best practices and available technologies. In this course, we examine cloud computing models, look into the threat model and security issues related to data and computation outsourcing, and explore practical applications of secure Cloud Computing.

COURSE GOALS

Upon successful completion of this course, students will:

- become familiar with the technology that enables and supports the effective use of Cloud Computing infrastructures;
- become familiar with an array of security and privacy issues in Cloud Computing systems, current best practices, and open problems;
- become familiar with legal and regulatory issues pertaining Cloud Computing;
- acquire experience in discussing and writing about Cloud Computing and security related issues.

PREREQUISITES

Registration in MS, Applied IT program or permission of Instructor.

COURSE FORMAT

The course will employ lectures, a mid-term exam to assess progress, and a final exam. Students will be required to write a technical paper on a topic which must be approved in advance by the instructor, and give a presentation at the end of the course.

TEXTBOOKS AND READING MATERIALS

Required Textbook

Securing the Cloud

The required textbook is available electronically through the Safari Tech Books Online collection. You can access this book by following these steps:

- Go to http://furbo.gmu.edu/dbwiz/alpha.php?start=s
- Click on the Safari Tech Books Online link near the top of the list. If you are off-campus, you will be asked to login using your Mason email user name and password.
- When the search screen opens, type the ISBN number (978-1-59749-592-9) of the book into the search box and click search, then click on the book title in the search results page. The next page that will open is the homepage for the book.
- Click on the Start Reading button to open the book.

Recommended Readings

Recommended readings include publications from standardization bodies such as NIST, government agencies, and the research community. Below is a tentative list of recommended readings.

- “NIST Cloud Computing Standards Roadmap”, NIST, July 2011

Additional readings and lecture slides will be made available by the instructor before class.

Course Outline

Below is an outline of the 15 weekly class meetings.

1. [08-30-2013] - Introduction to the course - Lecture 1: Introduction to cloud computing (Chapter 1)
2. [09-06-2013] - Lecture 2: Overview of networking concepts
4. [09-20-2013] - Lecture 4: Cloud computing architecture (Chapter 2)
5. [09-27-2013] - Lecture 5: Security Concerns and legal aspects (Chapter 3)
6. [10-04-2013] - Lecture 6: Securing the cloud: architecture (Chapter 4) - Review session
8. [10-18-2013] - **Lecture 7**: Securing the cloud: data (Chapter 5)
9. [10-25-2013] - **Lecture 8**: Securing the cloud: key strategies and best practices (Chapter 6)
10. [11-01-2013] - **Lecture 9**: Security criteria: building an internal cloud (Chapter 7)
11. [11-08-2013] - **Lecture 10**: Security criteria: selecting an external cloud provider (Chapter 8)
13. [11-22-2013] - **Lecture 12**: Operating a cloud (Chapter 10) - **Review session**
14. [12-06-2013] - **Student presentations**
15. [12-13-2013] - **Final exam**

**COURSE TOOLS**

The following tools will be used in this course.

- **Blackboard**: used to post class materials (slides, readings, etc.), and to grade individual class activities.
- **Piazza**: used to post sample quiz questions and solicit answers from students. Students can also post questions of general interest.

**ADDITIONAL RESOURCES & INFORMATION**

Below is a list of additional and useful resources.

- **University Catalog**
- **University Policies**
- **Honor Code**
- **Mason Diversity Statement**
- **Calendar of Religious Holidays**

**GRADING POLICY**

Grading will be based on class participation, assignments, and exams. Points for course activities will accrue as follow:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
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<tbody>
<tr>
<td>Class participation (≠ class attendance)</td>
<td>150</td>
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<tr>
<td>Mid-term exam</td>
<td>150</td>
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<tr>
<td>Presentation</td>
<td>100</td>
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<tr>
<td>Term paper</td>
<td>150</td>
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<tr>
<td>Final exam</td>
<td>150</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>700</strong></td>
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Final letter grades are assigned as follows. Breakpoints may be adjusted depending on overall class performance.
performance.

<table>
<thead>
<tr>
<th>Point % range</th>
<th>Letter grade</th>
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<tbody>
<tr>
<td>97% - 100%</td>
<td>A+</td>
</tr>
<tr>
<td>93% - 96.9%</td>
<td>A</td>
</tr>
<tr>
<td>90% - 92.9%</td>
<td>A-</td>
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<tr>
<td>87% - 89.9%</td>
<td>B+</td>
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<tr>
<td>83% - 86.9%</td>
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<td>80% - 82.9%</td>
<td>B-</td>
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<td>77% - 79.9%</td>
<td>C+</td>
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<td>73% - 76.9%</td>
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<td>70% - 72.9%</td>
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Students who wish to recover credits lost in other course activities can volunteer to give short presentations (4-5 content slides, 8-10 minutes) on a topic of their choice. Each short presentation will earn up to 30 points, for a maximum of two presentations per student during the entire course. Students must notify the instructor in advance of their intention to give a short presentation. Time and topic of the presentation must be approved by the instructor.

Regular attendance is strongly recommended. Students will be held responsible for all material covered in class. Exams are given on the dates specified on the course schedule. Absence from taking any exam will result in a score of zero, unless cleared in advance with the instructor and arranged for a makeup session. Excusable absences are normally related to unavoidable and documented emergency situations.