

# e516 - Engineering Cloud Computing for Engineering, Data Science, and Computer Science Students

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Editor

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<https://cloudmesh-community.github.io/book/vonlaszewski-cloud.epub>

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# **E516 - ENGINEERING CLOUD COMPUTING**

Gregor von Laszewski

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# **1 SYLLABUS**

Mon Aug 12 19:45:00 EDT 2019 

## **1.1 SYLLABUS ENGINEERING CLOUD COMPUTING**

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- Instructor: Gregor von Laszewski
- Contact: gvonlasz@indiana.edu

Office hours: By appointment

### **1.1.1 Audience**

- We recommend you know one programming language.
- Knowledge of python is of advantage but not required. Python is easy.

### **1.1.2 Course summary**

This class will introduce you to state-of-the-art cloud computing concepts and engineering approaches. This will include virtual machines, containers and Map/Reduce. The course will have a Lab in which you can practically explore these concepts. You will for example have the option to create a cloud as part of this course and explore cloud computing tools and frameworks.

### **1.1.3 References**

The course does not have required readings. We will provide the following references as pointers to what we will discuss:

### **1.1.4 Tools**

You will be required to have a computer to log into the cloud. We will give you access to an OpenStack cloud. Access to Azure, AWS, Google and others can be achieved through their free tier,

### **1.1.5 Course Schedule**

<b>Week</b>	<b>References</b>
1	Course Introduction
2	Cloud Data Centers
3	Python for Cloud Computing, Start of Project Selection
4	Cloud Architectures
5	Virtualization I - OpenStack
6	Virtualization II - AWS, Azure, Google
7	Multi Cloud Environment
8	Cloud Technology Presentation - Project Review
9	Containers - Docker, Kubernetes
10	Map Reduce
11	Messaging
12	REST
13	GO
14	Project Work
15	Projects Due
16	Project Improvements

For each of the topics you will find one or more relevant chapters or sections in our online book.

### **1.1.6 Attendance**

Attendance accounts for 10% of your final grade. If you need to skip class for any reason, you need to notify the instructor and TAs

### **1.1.7 Assignments**

This course will not have exams. Instead, we have the following graded assignment categories:

- Lab Assignments (pass/fail) are assignments that will be conducted on a weekly basis. They will help you making sure you not only understand the material theoretically, but try them out.
- Cloud Technology Review and Examples (Graded): (This can be substituted for more programming in your project). This is a document about a Cloud technology that is not yet included in our handbook to introduce an interested party to it. It should not contain advertisements but be a rational description of the technology with examples that you have tried yourself. You will have to give a non plagiarized presentation and document about it.
- Project Assignments (Graded): The most important part of the class for which you will be working throughout the semester. Up to three students can work in a project. In case of group projects, the project deliverables are increased.

The project has three submissions that are spread throughout the semester. Each submission builds on the previous one and modifies previous documents into a consistent project report and documentation for your project.

- Project Outline

A description of what your project is about and how it relates to cloud computing and address:

- What is the problem you try to address?
- What are you doing to address this problem?
- How are you addressing this problem?
- What is the architecture that addresses the problem that you will implement?

- Code and Documentation Review

- You will be asked to have a meeting with the TA's and/or instructor to showcase your code and have at least one review prior to your final submission.
- This will usually take place through the Lab hours on regular

basis.

- A first project discussion must have been done at least once at midterm time.
- Final Project Submission
  - All code and documentation must be checked into GitHub well before the semester is over. This allows us to give you feedback for improvements.

Please note that the syllabus is subject to change. Students in this class often come from a wide variety of backgrounds and experiences. As such, the instructor reserves the right to change the content of the course to accommodate the needs and expectations of the students.

### **1.1.8 Project Examples**

- <https://cloudmesh.github.io/cloudmesh-manual/projects/index.html>

### **1.1.9 Statement on Academic Misconduct**

Students will be expected to uphold and maintain academic and professional honesty and integrity as outlined in the Code of Student Rights, Responsibilities, and Conduct. Cases of academic misconduct will be handled according to the student disciplinary procedures described in IU's policies.