

ECE4150 Course Syllabus

ECE4150

Cloud Computing (2-0-3-3)

CMPE Degree

This course is Elective for the CMPE degree.

EE Degree

This course is Elective for the EE degree.

Lab Hours

0 supervised lab hours and 3 unsupervised lab hours

Course Coordinator

Madiseti, Vijay K

Prerequisites

CS1301 or equivalent

Corequisites

None

Catalog Description

Cloud computing technologies, computation models, and applications; design methodologies for cloud applications; use of cloud-based languages and tools in developing advanced applications.

Textbook(s)

Arshdeep Bahga, Vijay Madiseti, *Cloud Computing: A Hands-On Approach* (1st edition), CreateSpace Independent Publishing Platform, 2013. ISBN 9781494435141 (required)

Course Outcomes

Upon successful completion of this course, students should be able to:

1. Distinguish between several alternatives for cloud solutions and make a choice based on key performance metrics
2. Analyze different choices for implementation and deployment and recommend a suitable solution for an enterprise client.
3. Predict the impact of design choices for storage, computing and networking options on security, cost, performance and reliability of cloud-based implementations

Student Outcomes

In the parentheses for each Student Outcome:

"P" for primary indicates the outcome is a major focus of the entire course.

"M" for moderate indicates the outcome is the focus of at least one component of the course, but not majority of course material.

"LN" for "little to none" indicates that the course does not contribute significantly to this outcome.

1. (LN) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2. (LN) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. (M) An ability to communicate effectively with a range of audiences
4. (LN) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. (M) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. (P) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. (P) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topical Outline

Covers an introduction to cloud computing and the basic technologies

Introduction to Cloud Computing

Cloud Models

Cloud Compute, Storage and Database Services

Cloud Application Services

Content Delivery Services

Case Studies

Virtual Machines and Compute Services

Amazon EC2 Scaling and Load Balancing

Amazon Virtual Private Cloud

Cloud Application Services

Python Restful Web APIs

Python Web Frameworks ? Django

Serverless Applications

AWS Lambda

Severless Models

Amazon Storage Services (S3, EFS, EBS)

AWS Storage Gateways

SQL and No-SQL Databases

Amazon Redshift, DynamoDB, HBase, MongoDB, Neo4j

Queues and Connectors

Cases Studies ? Air Monitoring using different AWS solutions

Batch and Stream Analytics

HDFS, MapReduce, Hadoop, Pig, Ozzie

Case Studies

Real-Time Analytics ? Apache Spark, Storm, and Flink

Cloud Benchmarking

Cloud Security

AWS Well-Architected Framework ? Reliability, Security, Operational

AWS Cloud Services ? Route 53, CloudFront, Trusted Advisor, SNS, SW

Case Studies Illustrating WAF