ITT Technical Institute

SD4680T

Cloud Computing with Google App Engine and Microsoft Windows Azure

Onsite and Online Course

SYLLABUS

Credit hours: 4.5

Contact/Instructional hours: 56 (34 Theory Hours, 22 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisite: SD4555T Development for Web Analytics Applications or equivalent

Course Description:

This course examines strategies and techniques applicable to the development environment for cloud-based applications

COURSE SUMMARY

COURSE DESCRIPTION

This course examines strategies and techniques applicable to the development environment for cloud-based applications.

MAJOR INSTRUCTIONAL AREAS

1. Definition, Value Proposition and Cloud Architecture
2. Services, Applications, Virtualization and Capacity Planning
3. Platform as a Service and Service Oriented Architecture
4. Google Web Services
5. Amazon Web Services
6. Microsoft Cloud Services
7. Managing the Cloud and Cloud Security
8. Moving Applications to the Cloud and Cloud-Based Storage
9. Working with Productivity Software, Webmail Services, Communicating with the Cloud and Using Media and Streaming
10. Working with Mobile Devices and Mobile Web Services

COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Define cloud computing and its architecture.
2. Explain cloud services and applications and the methods for capacity planning.
3. Explain service-oriented architecture (SOA) and platform as a service.
4. Compare and contrast cloud services from major providers such as Google, Amazon, and Microsoft.
5. Analyze how to effectively manage the operation and security of the cloud services.
6. Explain how to migrate services to the cloud and how to provision cloud storage services.
7. Identify strategies for working with productivity software, mail, and media rich services.
8. Identify strategies for working with mobile Web services and mobile devices.

MODULE 1: CLOUD BUSINESSDRIVERSAND CONCEPTS

COURSE LEARNING OBJECTIVES COVERED

- Define cloud computing and its architecture.
- Explain cloud services and applications and the methods for capacity planning.
- Explain service-oriented architecture (SOA) and platform as a service.
- Compare and contrast cloud services from major providers such as Google, Amazon, and Microsoft.

TOPICS COVERED

- Providers and Consumers
- Business Drivers
- Roles and Boundaries
- Cloud Characteristics
- Delivery and Deployment Models

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Erl, Mahmood & Puttini, Chapters 3-4	No	6 hrs
Reading: ITT Tech Virtual Library>Basic Search>*Amazon Web Services For Dummies>Chapters 1-3*	No	5 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled “Cloud Services.”	Yes	N/A
Lab: Complete the lab titled “Explore Amazon Web Services.”	Yes	N/A
Project: Read and begin the project.	No	1hr

Total Out-Of-Class Activities: 14 Hours

MODULE 2: INFRASTRUCTURE, SECURITY, AND PaaS

COURSE LEARNING OBJECTIVES COVERED

- Explain service-oriented architecture (SOA) and platform as a service.
- Compare and contrast cloud services from major providers such as Google, Amazon, and Microsoft.
- Analyze how to effectively manage the operation and security of the cloud services.

TOPICS COVERED

- Enabling Technologies
- Cloud Security Threats

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Erl, Mahmood & Puttini, Chapters 5-6	No	7 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled “Benefits of PaaS.”	Yes	N/A
Analysis: Submit the analysis titled “Security Risks.”	Yes	3hrs
Lab: Complete the lab titled “Exploring Azure.”	Yes	0.5 hr
Project: Continue work on Project Part 1.	No	2.5 hrs

Total Out-Of-Class Activities: 15 Hours

MODULE 3: CLOUD MECHANISMS

COURSE LEARNING OBJECTIVES COVERED

- Define cloud computing and its architecture.
- Explain cloud services and applications and the methods for capacity planning.
- Explain service-oriented architecture (SOA) and platform as a service.
- Compare and contrast cloud services from major providers such as Google, Amazon, and Microsoft.
- Analyze how to effectively manage the operation and security of the cloud services.
- Explain how to migrate services to the cloud and how to provision cloud storage services.

TOPICS COVERED

- Compute, Storage, and Network
- Monitoring and Replication
- Specialized Mechanisms
- Management Mechanisms

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Erl, Mahmood & Puttini, Chapters 7-9	No	10.5 hrs
Reading: ITT Tech Virtual Library>Basic Search>*Fundamentals of Communications and Networking>Chapter 7*	No	2.5 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled “Advantages of Cloud.”	Yes	N/A
Lab 1: Complete the lab titled “Creating Virtual Data Center.”	Yes	N/A
Lab 2: Complete the lab titled “Using Azure Tables and Azure SQL.”	Yes	1.5 hrs
Project: Submit Project Part 1.	Yes	3.5 hrs

Total Out-Of-Class Activities: 20 Hours

MODULE 4: SECURITY AND FUNDAMENTAL ARCHITECTURES

COURSE LEARNING OBJECTIVES COVERED

- Define cloud computing and its architecture.
- Explain cloud services and applications and the methods for capacity planning.
- Explain service-oriented architecture (SOA) and platform as a service.
- Compare and contrast cloud services from major providers such as Google, Amazon, and Microsoft.
- Analyze how to effectively manage the operation and security of the cloud services.
- Explain how to migrate services to the cloud and how to provision cloud storage services.

TOPICS COVERED

- Security Mechanisms
- Fundamental Cloud Architectures
- Azure Cloud Services

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Erl, Mahmood & Puttini, Chapters 10-11	No	6 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled "Security Mechanisms in Cloud Service."	Yes	N/A
Analysis: Submit the analysis titled "Choose an Architecture."	Yes	3 hrs
Lab 1: Complete the lab titled "Exploring Google Cloud Platform."	Yes	N/A
Lab 2: Complete the lab titled "Building Azure Cloud Services."	Yes	1 hr
Project: Begin work on Project Part 2.	No	3 hrs

Total Out-Of-Class Activities: 15 Hours

MODULE 5: ADVANCED AND SPECIALIZED DELIVERY MODELS

COURSE LEARNING OBJECTIVES COVERED

- Define cloud computing and its architecture.
- Explain cloud services and applications and the methods for capacity planning.
- Explain service-oriented architecture (SOA) and platform as a service.
- Compare and contrast cloud services from major providers such as Google, Amazon, and Microsoft.
- Explain how to migrate services to the cloud and how to provision cloud storage services.
- Identify strategies for working with productivity software, mail, and media rich services.

TOPICS COVERED

- Advanced Architectures
- Specialized Architectures
- Azure Blobs
- Azure Queues
- Cloud Delivery Models

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Erl, Mahmood & Puttini, Chapters 12-14	No	10 hrs
Lesson: Study the lesson for this module.	No	2 hrs
Discussion: Participate in the discussion titled “Architecture and Service Providers.”	Yes	N/A
Analysis: Submit the analysis titled “Addressing Storage Requirements in Cloud.”	Yes	3 hrs
Lab 1: Complete the lab titled “Using Azure Queues and Blobs.”	Yes	2 hrs
Lab 2: Complete the lab titled “Exploring Productivity Services.”	Yes	N/A
Project: Continue work on Project Part 2.	No	2.5 hrs

Total Out-Of-Class Activities: 19.5 Hours

MODULE 6: MOBILE SERVICES AND COST ESTIMATION

COURSE LEARNING OBJECTIVES COVERED

- Define cloud computing and its architecture.
- Explain cloud services and applications and the methods for capacity planning.
- Explain service-oriented architecture (SOA) and platform as a service.
- Compare and contrast cloud services from major providers such as Google, Amazon, and Microsoft.
- Analyze how to effectively manage the operation and security of the cloud services.
- Explain how to migrate services to the cloud and how to provision cloud storage services.
- Identify strategies for working with productivity software, mail, and media rich services.
- Identify strategies for working with mobile Web services and mobile devices.

TOPICS COVERED

- Cost Estimation and Pricing
- Azure Mobile Services

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Erl, Mahmood & Puttini, Chapter 15	No	3.5 hrs
Lesson: Study the lesson for this module.	No	1.5 hrs
Lab: Complete the lab titled “Exploring Azure Mobile Services.”	Yes	N/A
Project: Submit Project Part 2.	Yes	3 hrs
Final Exam: Prepare for the final exam.	No	5 hrs
Final Exam: Take the final exam.	Yes	N/A

Total Out-Of-Class Activities: 13 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

CATEGORY	WEIGHT
Discussion	10%
Analysis	15%
Lab	30%
Project	25%
Final Exam	20%
TOTAL	100%

GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

GRADE		PERCENTAGE
A	(4.0)	90-100%
B+	(3.5)	85-89%
B	(3.0)	80-84%
C+	(2.5)	75-79%
C	(2.0)	70-74%
D+	(1.5)	65-69%
D	(1.0)	60-64%
F	(0.0)	<60%

LEARNING MATERIALS AND REFERENCES

REQUIRED RESOURCES

COMPLETE TEXTBOOK PACKAGE

- Erl, T., Mahmood, Z. & Puttini, R. (2013). *Cloud Computing: Concepts, Technology & Architecture. Upper Saddle River, NJ: Prentice Hall.*

RECOMMENDED RESOURCES

- Books and Professional Journals
  - International Journal of Cloud Computing (http://www.inderscience.com/jhome.php?jcode=ijcc)
  - IT Professional (http://www.computer.org/Web/computingnow/itpro)
  - International Journal of Communication Networks and Distributed Systems (http://www.inderscience.com/jhome.php?jcode=ijcnds)
  - American Journal of Software Engineering (http://www.sciepub.com/journal/AJSE)
- Professional Associations
  - Cloud Security Alliance (https://cloudsecurityalliance.org)
  - Cloud Advisory Council (http://cloudadvisorycouncil.com/)
  - Cloud Industry Forum (http://www.cloudindustryforum.org/)
- Books and Professional Journals
  - Mahmood, Z. (2013). *Cloud Computing: Methods and Practical Approaches. London; New York: Springer.*
  - Antonopoulos, N, & Gilliam, L. (2010). *Cloud Computing: Principles, Systems and Applications. London: Springer.*
- ITT Tech Virtual Library(accessed via Student Portal | https://studentportal.itt-tech.edu)
  - Basic Search>
    - Golden, B. (2013). *Amazon Web Services For Dummies. Hoboken, NJ: John Wiley & Sons.*
    - Goralski, W. (2009). *How TCP/IP Works in a Modern Network. Burlington, MA: Morgan Kaufmann Publishers.*
    - Solomon, M, Kim, D. & Carrell, J. (2015). *Fundamentals of Communications and Networking. Burlington, MA: Jones and Bartlett Learning.*
    - Marks, E. & Lozano, B. (2010). *Executive's Guide to Cloud Computing. Hoboken, NJ: John Wiley & Sons.*
    - Krutz, R. & Vines, R. (2010). *Cloud Security: A Comprehensive Guide to Secure Cloud Computing. Norwood, MA: John Wiley & Sons.*
    - Ilyas, M. & Ahsan, S. (2011). *Cloud Computing and Software Services: Theory and Techniques. Boca Raton, FL: Auerbach Publications.*

- Marinescu, D. (2013). *Cloud Computing: Theory and Practice. Waltham, MA: Morgan Kaufmann Publishers.*

- Other References
  - Amazon Web Services (http://aws.amazon.com/)
  - Microsoft Azure (https://Azure.microsoft.com/en-us/)
  - Google Cloud Platform (https://cloud.google.com/)
  - MSDN (https://msdn.microsoft.com/)

INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, use of technology, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as such as guided discovery where you will start your information journey by being introduced to ideas and will be actively encouraged to research and reflect upon these ideas to further your own understanding. You will apply your understanding to complete the various assessments in this course to come up with practical industry-based deliverables. You can also use the discussions to share best practices, tips, and solutions with your classmates. The lessons in this course will focus on enabling you to think and reflect on your designs for the labs and the project. Your progress will be regularly assessed through a variety of assessment tools including discussions, analyses, labs, project, and final exam.

OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities, which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum, and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

ACADEMIC INTEGRITY

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic honesty policies, refer to the Student Handbook and the School Catalog.

INSTRUCTOR DETAILS

Instructor Name	
Office Hours	
Contact Details	

(End of Syllabus)