

NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY ITN 257 - CLOUD COMPUTING: INFRASTRUCTURE AND SERVICES (3 CR.)

Course Description

Focuses on cloud infrastructure, deployment, security models, and the key considerations in migrating to cloud computing. Covers the technologies and processes required to build traditional, virtualized, and cloud data center environments, including computation, storage, networking, desktop and application virtualization, business continuity, security, and management. Lecture 3 hours per week.

General Course Purpose

Cloud computing is becoming increasingly popular in the field of information technology. Companies in the industry are relying on various cloud computing services for storage, processing power, and an alternative to on-premises solutions. Students will gain an introduction to the cloud-computing environment and various services offered. The course is intended for people interested in the IT legal and IT marketing fields, business analysts, project managers, and other IT-related professionals.

Course Prerequisites/Corequisites:

None

Course Objectives

Upon completion of this course, students will be able to:

- a) Define cloud services and the basic global cloud infrastructure
- b) Describe the key services on the cloud platform and their common features
- c) Describe basic cloud architectural structures
- d) Describe basic security and compliance aspects of the cloud platform and the shared security model
- e) Define vendor support, account management and pricing models

Major Topics to be Included

1. Define basics, cloud services and the basic global cloud infrastructure
 - 1.1. Computing models
 - 1.1.1. Traditional on-premises computing
 - 1.1.2. Cloud computing
 - 1.1.3. Hybrid – connecting on-premises with cloud computing
 - 1.2. Cloud Architecture and Data Centers
 - 1.2.1. Physical Security
 - 1.2.2. Redundant power, networking, and connectivity in separate facilities
 - 1.2.3. Fault tolerance to remain operational during component failure
 - 1.3. Cloud Concepts
 - 1.3.1. Scalability, Elasticity
 - 1.3.2. Auto Scaling
 - 1.3.3. Load Balancing
 - 1.3.4. Reliability, Fault Tolerance
 - 1.3.5. Automation
 - 1.3.6. Decoupling
 - 1.4. Cloud Benefits
 - 1.4.1. Resource Management
 - 1.4.2. Agility, Experimentation, Innovation

- 1.4.3. Reliability
- 1.4.4. Costs
- 1.5. Describe basic/core characteristics of deploying and operating in the AWS Cloud
- 2. Describe the key services on the cloud platform and their common features.
 - 2.1. IaaS
 - 2.2. PaaS
 - 2.3. Examples of Hardware, Operating Systems, and Software Images
 - 2.4. Elastic Computing, Scalability and Auto Scaling
 - 2.5. Load Balancing
 - 2.6. Disaster Recovery
 - 2.7. Storage
 - 2.7.1. Elastic Storage
 - 2.7.2. SSD vs. Magnetic Storage
 - 2.7.3. Cold Storage
 - 2.7.4. Availability and Durability
 - 2.7.5. Replication
 - 2.7.6. Caching Services
 - 2.7.7. Data Transfer from on-prem to cloud
 - 2.8. Databases
 - 2.8.1. Relational Databases
 - 2.8.2. Data Warehousing
 - 2.8.3. Database Migration Services
 - 2.8.4. Data Transfer from on-prem to cloud
 - 2.8.5. Other database options, if applicable
 - 2.9. Monitoring
 - 2.9.1. System Monitoring
 - 2.9.2. Performance Monitoring
 - 2.9.3. Cost Monitoring
 - 2.9.4. Optimization
 - 2.9.5. Notifications
 - 2.9.6. Threshold Limits
 - 2.9.7. Automation
 - 2.10. Event-driven computing, events and listeners
 - 2.11. Tagging / Labeling of Products for ease of management
 - 2.12. "Serverless" Architecture
 - 2.13. Debugging
 - 2.14. Queueing
 - 2.15. Content Delivery and/or Web Front-End Features
 - 2.16. Optional – Additional Features, as applicable
 - 2.17. Software Development Kits and APIs
 - 2.18. Deployment
 - 2.18.1. Process(es) for Deployment
 - 2.18.2. Use of templates or other mechanism for controlled, repeatable deployment
 - 2.19. Optional - Any additional important features or services, if applicable
- 3. Describe basic cloud architectural structures.
 - 3.1. High Availability
 - 3.2. Fault Tolerance
 - 3.3. Services and Features
- 4. Describe basic security and compliance aspects of the cloud platform and the shared security model
 - 4.0 Customer Responsibilities vs. Vendor Responsibilities
 - 4.1. Access Control & Management
 - 4.1.1. Security Groups, Roles, and/or Accounts
 - 4.1.2. Principle of Least Privilege
 - 4.2. Malware, Vulnerability Scanning and Protection

4.3. Security Compliance Industry Standards

- 5. Define vendor support, account management and pricing models
 - 5.1. Pricing Plans
 - 5.2. Vendor Support Models
 - 5.3. Cost Exploration Tools
 - 5.4. Identify sources of documentation or technical assistance (e.g., whitepapers, support tickets)

Required Time Allocation per Topic

In order to standardize the core topics of this course so that a course taught at one campus is equivalent to the same course taught at another campus, the following student contact hours per topic are required. Each syllabus should be created to adhere as closely as possible to these allocations. Sections of the course that are given in alternative formats from the standard 16-week section still meet for the same number of contact hours. **The final exam time is not included in the time table.**

Topic	Hours	Percent
Cloud Basics and the global cloud infrastructure	3	6.5%
Cloud Services and Common Features	27	61%
Cloud Architecture Structures	3	6.5%
Security in the Cloud	3	6.5%
Vendor Support, Account Management and Pricing Model Examples	3	6.5%
Quizzes and/or Exams, to demonstrate knowledge	6	13%
Total:	45	100%