



Course: Cloud Computing – 0907523 (3 Cr. – Elective Course)

Course Description: Cloud computing has transformed the traditional IT industry into an agile, elastic, and economical IT paradigm. This course covers the principles of distributed systems and cloud computing. The course will familiarize students with cloud characteristics, deployment models, and enabling technologies; hypervisors and virtual machines, secure data centers architecture, and service-oriented architecture. Students, also, will gain hands-on experience with Amazon Web Services (AWS) such as EC2, S3, Dynamo database, and Amazon EMR to leverage the latest Big data processing platforms (Apache Hadoop). Additionally, students will be exposed to GENI infrastructure and Microsoft's Azure and conduct experiments that leverage cutting-edge cloud services. Advanced topics related to cloud architecture and applications security will be discussed.

Prerequisites by Course: 0907422 Computer Networks.

Prerequisites by Topic: Students must have the basics of computer networks and familiarity with Python.

Textbook:

- Cloud Computing: A Comprehensive Guide to Cloud Computing, Austin Young, 1st edition, 2019.
- Cloud Computing: Master the Concepts, Architecture and applications with Real-world examples and Case studies, Kamal Kant Hiran et al., 1st edition, BPB, 2019.

References:

- Amazon Web Services: A Beginner's Guide to Cloud Computing, app Development and Big Data Storage with AWS, Paul Wood, EuroSolutions2Ltd, 2018.
- Cloud Computing Concepts, Technology & Architecture, Thomas Erl, Zaigham Mahmood, and Ricardo Puttini, 1st edition, Prentice hall, 2013.
- Amazon Web Services Website, <http://aws.amazon.com>

Minimum Student Material: Textbook, class handouts, some instructor keynotes, Labs instructions, and access to a personal computer and Internet.

Minimum College Facilities: Classroom with whiteboard and projection display facilities, library.

Course Objectives: The objectives of this course are:

1. Introduce students to cloud computing concepts and fundamentals.[2][6]
2. Familiarize students with cloud deployment models, platforms, and vendors.[2][6]
3. Introduce students to cloud-enabling technologies such as virtualization. [6][7]
4. Hands-on-experience with AWS and GENI.[6][7]

Course Topics:

1. Cloud characteristics, fundamentals, and deployment models (private, hybrid, and public cloud) and their advantages and disadvantages
2. Cloud providers and services: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and finally Anything as a Service (XaaS)
3. AWS services: Elastic Cloud Computing (EC2), Simple Storage Service (S3), Virtual Private Cloud (VPC), CloudFront, load balancing services, auto-scaling, and RDMS.
4. Virtualization: Hypervisors, Virtual Machines Managers (VMMs) and Virtual Machines (VMs)
5. Cloud and IoT
6. Cloud security: vulnerabilities, threats, and attacks.
7. Web services

Policies

- **Attendance is mandatory and required. Class attendance will be taken every class and the university's policies will be enforced in this regard.**
- **Students are not allowed to move between any of the seven sections.**
- **Personal excuses are not accepted and will be counted towards the absence limit (15% of the total number of classes).**
- **All submitted work must be yours. Cheating will not be tolerated. We will select random assignments and check them for plagiarism, and we will change your mark to zero for these assignments due to cheating at any time during the semester. The same applies to exams. We will apply JU policies and regulations in this regard.**
- Join the MS Teams group of this course.

Grading policy

Grading	
AWS Labs & HW	30%
Midterm exam	30%
Final exam	40%

Instructor:

Dr. Samah

Rahamneh

Program Outcomes (PO) Program Outcomes (PO)

[1]	an ability to identify, formulate, and solve complex engineering problem engineering, science, and mathematics
[2]	an ability to apply engineering design to produce solutions that meet sp public health, safety, and welfare, as well as global, cultural, social, env
[3]	an ability to communicate effectively with a range of audiences
[4]	an ability to recognize ethical and professional responsibilities in engine informed judgments, which must consider the impact of engineering sol environmental, and societal contexts
[5]	an ability to function effectively on a team whose members together prc collaborative and inclusive environment, establish goals, plan tasks, an
[6]	an ability to develop and conduct appropriate experimentation, analyze engineering judgment to draw conclusions
[7]	an ability to acquire and apply new knowledge as needed, using appro

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[1]	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
[2]	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]	an ability to communicate effectively with a range of audiences

