



## Course Syllabus

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS Credits</b>
COMP-521DL	Cloud Computing	10
<b>Prerequisites</b>	<b>Department</b>	<b>Semester</b>
COMP-515DL	Computer Science	Fall
<b>Type of Course</b>	<b>Field</b>	<b>Language of Instruction</b>
Elective	Computer Science	English
<b>Level of Course</b>	<b>Lecturer(s)</b>	<b>Year of Study</b>
2 <sup>nd</sup> Cycle	Dr. Nicholas Loulloudes	1 <sup>st</sup> or 2 <sup>nd</sup>
<b>Mode of Delivery</b>	<b>Work Placement</b>	<b>Corequisites</b>
Distance Learning	N/A	N/A

### Course Objectives:

The main objectives of the course are to:

- Introduce the background and concepts of cloud computing
- Compare and contrast cloud computing with other computing paradigms
- Cover in detail the different technologies used in cloud computing including: virtualization, scalability, elasticity, and load balancing
- Expose the students to cloud services and platforms
- Make students aware of problems and challenges when designing and developing applications using cloud computing technology
- Expose the students to development tools/environments/frameworks to develop applications using cloud computing infrastructure
- Cover in detail how to secure cloud infrastructures and applications.
- Learn how to design and deploy Cloud applications over the infrastructure of currently established providers

**Learning Outcomes:**

After completion of the course students are expected to be able to:

1. Describe the concept, benefits, principals, architecture, and implementation technology of cloud computing
2. Compare and contrast the cloud computing with other computing paradigms
3. Explain in details aspects of the cloud computing including: virtualization, scalability, elasticity, and load balancing
4. Explain fundamental architecture, models, services, and platforms that are used in the cloud computing domain
5. Be aware of problems and challenges as to avoid them when designing and developing cloud based applications
6. Design and develop cloud based applications to be hosted by various cloud computing infrastructures
7. Summarize what is needed in order to secure the cloud infrastructure and applications hosted on a cloud infrastructure
8. Demonstrate the ability to select an appropriate technology/platform/environment in order to provide a cloud computing based application that fulfills the design requirements.
9. Explain in detail the concept of Big Data analytics and how fundamental concepts of it are supported by Cloud technologies
10. Understand how the demand for cloud resources changes in the course of time and the need to elastically adapt resource demand and offer based on the utilization.

**Course Content:**

1. Introduction to Cloud Computing
2. Principles of Parallel and Distributed Computing
3. Cloud Concepts and Technologies
4. Virtualization in Depth
5. Cloud Architecture, Services and Platforms
6. MapReduce and Hadoop
7. Design of Cloud Applications
8. IaaS Providers (Amazon Web Services)

9. Cloud Application Development
10. Cloud Security
11. Big Data Analytics
12. Resource Elasticity

### Learning Activities and Teaching Methods:

Distance Learning Lectures, Videos, Presentations, Tutorials, Theoretical Exercises and Assignments

### Assessment Methods:

- Assignments
- Course Project (programming, individual project)
- Final Examination

### Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Mastering Cloud Computing, Foundations and Applications Programming	R. Buyya, C. Vecchiola, S. T. Selvi	Elsevier	2013	978-0-12-411454-8
Cloud Computing: A Hands-On Approach	A. Bahga, V. Madiseti	CreateSpace	2013	978-1494435141

### Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Cloud Computing: Concepts,	T. Erl, R. Puttini, Z. Mahmood	Prentice Hall	2013	978-0133387520

Technology & Architecture				
Cloud Computing Strategies	D. N. Chorafas	CRC Press	2010	978-1439834534
Pro Amazon EC2 and WS: Elastic Computing Cloud and Web Services Development with Java	M. Yankelevich, M. Malamud, D. Mahaya	APRESS	2011	978-1430224471