

**COURSE DESCRIPTION****1. Program Information**

1.1 University	“Alexandru Ioan Cuza” University of Iași
1.2 Faculty	Faculty of Computer Science
1.3 Department	Computer Science
1.4 Study Domain	Computer Science
1.5 Study Cycle	Bachelor Degree
1.6 Study Program / Qualification	Computer Science

2. Course Information

2.1 Course Name	Cloud Computing						
2.2 Course Teacher	Associate Professor Lenuta Alboaic, PHD						
2.3 Seminary Teacher	Associate Professor Lenuta Alboaic, PHD						
2.4 Study Year	3	2.5 Semester	2	2.6 Evaluation	EC	2.7 Course Status*	OP

* OB – Compulsory / OP – Optional

3. Total estimated hours (hours per semester and didactic activities)

3.1 Hours per week	4	in which: 3.2 course	2	3.3 seminary/laboratory	2
3.4 Hours in curriculum	56	in which: 3.5 course	28	3.6 seminary/laboratory	28
Time Distribution					hours
Manual study, Course support, Bibliography, and others					40
Supplementary Documentation in library, in electronic forums, and on the field					0
Seminaries/laboratories preparation, homeworks, reports, portfolios and essays					46
Tutoring (not applicable)					
Evaluation (evaluation during the course + final evaluation)					4
Other activities (consultations per student)					4
3.7 Total hours individual study [ST + DS + PS]					86
3.8 Total hours per semester [numar credite x 30 = T + E + C +TI]					150
3.9 Credits					5

Obs. T = C + S

4. Preconditions (if necessary)

4.1 Of Curriculum	Previous Courses Attended: Operational Systems, Computer Networks, Web Technologies
4.2 Of Skills	

5. Conditions (if necessary)

5.1 For Course Operation	
5.2 For Seminary/Laboratory Operation	



6. Specific Skills Acquired (Definitions of the following concepts can be found here: <http://docis.acpart.ro/uploads/Fisiere/Metodologie%20CNCIS.pdf>)

Professional Skills	<p>C1. Knowledge of basic concepts on Cloud Computing</p> <p>C2. Knowledge of IaaS, PaaS, SaaS characteristics</p> <p>C3. Ability to work and design systems based on different technologies offered by cloud systems (Azure, Google App Engine, Amazon(EC2, S3) et al.)</p> <p>C4. Knowledge of security issues in the Cloud.</p> <p>C5. Knowledge of private Cloud characteristics</p> <p>C6. Obtaining a general view over the domain</p>
Transversal Skills	<p>CT1. The ability to communicate and collaborate with colleagues in the team.</p> <p>CT2. The ability to assess previous experiences obtained in the design and the use of various distributed systems, and the ability to adapt to emerging needs.</p>

7. Course Objectives (from the grid of specific skills acquired) [More details here: http://docis.acpart.ro/uploads/Fisiere/Metodologie%20CNCIS.pdf](http://docis.acpart.ro/uploads/Fisiere/Metodologie%20CNCIS.pdf)

7.1 General Objectives	<ul style="list-style-type: none"> • Ability to understand architectural pattern of distributed systems • Ability to design and to program applications that performs distributed processing using different cloud platforms • Ability to identify the advantages and disadvantages of choosing a cloud technology for a given situation
7.2 Specific Objectives	<p>On successful completion of this course, students will be able to:</p> <ul style="list-style-type: none"> • Explain the concepts associated with Cloud Systems • Identify and describe functions and relations between the structural components of a Cloud System • Design and implement applications in Cloud systems, with various characteristics.

8. General Description

8.1	Course	Teaching Methods	Observations (hours and bibliographic references)
1.	Cloud Computing- Overview	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
2.	Cloud Computing - Characteristics	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
3.	Infrastructure as a Service(IaaS)	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography



4.	Platform as a Service(PaaS)	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
5.	Google App Engine	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
6.	Cloud Technologies (Node. js, Redis)	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
7.	Cloud Computing- Business Aspects	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
8.	Architectural aspects in Cloud	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
9.	Microsoft - Azure	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
10.	Architectural aspects in Cloud	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
11.	Architectural aspects in Cloud	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
12.	Cloud Computing - private cloud and security aspects	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography
13.	Cloud Computing - Vision	Interactive presentations (video). Online access to additional resources via the course website.	2, see bibliography

Bibliography

- Cloud Computing, Navan Ruparelia, The MIT Press Essential Knowledge Series, 2016
- Mobile Cloud Computing, Debashis De, Architectures, Algorithms and Applications, Taylor & Francis CRC, 2016
- Cloud Computing Virtualization Specialist Complete - Certification Kit, Copyright © The Art Of Service
- Cloud Computing - Concepts, Technology & Architecture, Thomas Erl, Zaigham Mahmood, Ricardo Puttini , 2013
- Cloud Computing and SOA Convergence in Your Enterprise, Dvid S. Lintchium, 2010
- Cloud Computing: A Practical Approach, Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, McGraw-Hill Companies, 2010
- Grid and Cloud Computing A Business Perspective on Technology and Applications, Editors: Katarina StanoevskaSlabeva, Santi Ristol, Springer-Verlag Berlin Heidelberg 2010
- Grids, Clouds and Virtualization, Editors: Massimo Cafaro, Giovanni Aloisio, Springer, 2011
- Hadoop: The Definitive Guide, Tom White, O'Reilly Media, 2011
- The Cloud at Your Service, Jothy Rosenberg , Arthur Mateos, Manning Publications, 2011



- CLOUD COMPUTING, Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej Goscinski, Australia Wiley, 2011
- Cloud Computing Implementation, Management, and Security, John W. Rittinghouse, James F. Ransome, CRC Press Taylor & Francis Group, 2010

Additional references will be added during each course to the list above. Students have the obligation to consult the bibliography of the resources indicated during the course/ laboratory.

8.2	Seminary / Laboratory	Teaching methods	Observations (hours and bibliographic references)
1.	Web Services	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
2.	Web Services	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
3.	RESTFull APIs	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
4.	RESTFull APIs	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
5.	Cloud Applications Development using Google App Engine	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
6.	Cloud Applications Development using Google App Engine	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
7.	Cloud Applications Development using Windows Azure	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
8.	Cloud Applications Development using Windows Azure	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
9.	IoT and Cloud Applications Development	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
10.	IoT and Cloud Applications Development	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
11.	IoT and Cloud Applications Development	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
12.	Studying new trends and technologies in Cloud Computing	Direct interaction. Online access to additional resources via the course website.	2, see bibliography
13.	Studying new trends and technologies in Cloud Computing	Direct interaction. Online access to additional resources via the course website.	2, see bibliography

**Bibliography**

- Cloud Computing, Navan Ruparelia, The MIT Press Essential Knowledge Series, 2016
- Mobile Cloud Computing, Debashis De, Architectures, Algorithms and Applications, Taylor & Francis CRC, 2016
- Cloud Computing Virtualization Specialist Complete - Certification Kit, Copyright © The Art Of Service
- Cloud Computing and SOA Convergence in Your Enterprise, David S. Lintchium, 2010
- <http://www.windowsazure.com>
- Amazon Grants Program – <http://aws.amazon.com>
- <http://martinfowler.com/articles>
- <http://code.google.com/appengine/>

Additional references will be added during each course to the list above. Students have the obligation to consult the bibliography of the resources indicated during the course/ laboratory

9. Course content synchronization with the expectations of the community representatives, professional associations and employers from the program domain

The course is constantly updated to the current international trends of Cloud Computing. Specialists belonging to companies with great influential results in the field will be invited during lectures (Google, Microsoft, Amazon). Also, during the course students will have the opportunity to use academic licenses offered by the providers of the Cloud Services used. These licenses are obtained by the course leader after applying for academic grants supported by these companies.

10. Evaluation

Activity Type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 The weight of each evaluation form (%)
10.4 Course	Final Project (P)	Due date is last two weeks of the semester. The Final projects is marked with minimum 0 points and maximum 10 points. It weights 40% of the final grade. It is an evaluation method along the way and cannot be reassessed after the due date expires. Project bonuses for extra activities will be added accordingly.	40%
10.5 Seminary/ Laboratory	Laboratory Activity (L)	Completion of 5 applied knowledge assignments during the semester, which are marked with 10 points each. The evaluation of these assignments is done based on the results presented during the laboratory activities and on the source code uploaded at a proposed link by the course leader. All assignments are evidence of ongoing evaluation and must comply with the due date specified by the seminary/ laboratory lecturer.	50%



		<p>Mentions:</p> <ul style="list-style-type: none">• One assignment is the equivalent of half an hour presentation related to the topics of the course, which has previously been reviewed and accepted by the course leader.• One assignment is the equivalent of a published scientific paper related to the topics of the course (only with the prior acceptance of the course leader).	
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10.6 Minimal performance standards

The final grade is calculated as it follows: **$N = 0.4 * P + 0.5 * L + 1$**
The obtained mark must be greater than 5.

Date

Course Teacher
Lenuta AlboaicSeminary/Laboratory Teacher
Lenuta Alboaic

Department Date of Approval

Director of the Department