CI/CD CLOUD COMPUTING

COURSE SYLLABUS

Code and name of specialty	121 Software Engineering	**Institute / faculty**	Faculty of Computer Science and Software Engineering
Program name	“Software Engineering”	**Department**	Software Engineering and Management Information Technologies
Type of program	Educational and Professional	**Language of instruction**	Ukrainian, English

LECTURER

Full name, *e-mail*	**Volodymyr Burdaev, *Volodymyr.Burdaev@khpi.edu.ua***

Ph.D., Senior Research Fellow, Associate Professor of Software Engineering and Information Technology Management. Prepared and published more than 192 publications, 6 monographs, 9 collective monographs, google scholar: https://scholar.google.com/citations?user=&user=RX9JedIAAAAJ, ORCID: https://orcid.org/0000-0001-9848 -9059, 2 articles in publications indexed in Scopus: https://www.scopus.com/authid/detail.uri?authorId=6507982230, https://www.scopus.com/authid/detail.uri?authorId=57224197566**.**
Leading lecturer of the courses: Artificial Intelligence Systems (in Ukrainian, English, bachelor), Organization and technology of cloud computing (in Ukrainian, English, bachelor / master), Data warehouses (in Ukrainian, English, bachelor), Database technology and knowledge bases (in Ukrainian, English, bachelor), Business Analytics Systems (in Ukrainian, English, bachelor).

GENERAL DESCRIPTION OF THE COURSE

Summary	The discipline "CI/CD Cloud Computing" is a discipline of the cycle of professional compulsory training in the specialty 121 "Software Engineering". It is taught in the fifth semester in the amount of 90 hours (3 ECTS credits), in particular: lectures - 16 hours, laboratory - 32 hours, independent work - 42 hours. The course provides two content modules and one module test. The discipline ends with a credit.
Course objectives	Teaching students theoretical knowledge and acquiring practical skills in the use of cloud computing technologies, cloud deployment models, basic models of cloud computing services, development of web applications for research in the cloud environment
Types of classes and control	Lectures, laboratory classes. Continuous assessment – laboratory works, intermediate modular assessment. Final assessment – credit.
Term	5

Student workload (credits) / Type of course	3 / Mandatory	**Lectures (hours)**	16	**Laboratory classes (hours)**	32	**Self-study (hours)**	42

Program competences	GC 05. Ability to learn and master modern knowledge. GC 06. Ability to search, process and analyze information from various sources. PC24. Ability to carry out the system integration process, apply change management standards and procedures to maintain the integrity, overall functionality and reliability of the software. PC25. Ability to reasonably select and master software development and maintenance tools.

Learning outcomes	**Teaching and learning methods**	**Forms of assessment (continuous assessment CAS, final assessment FAS)**
PO01. Analyze, purposefully search for and select the necessary information and reference resources and	Interactive lectures with presentations, discussions, laboratory classes, teamwork, case method, student feedback method, problem-based learning	Written individual assignments for laboratory works (CAS), assessment of knowledge in laboratory classes (CAS), express surveys (CAS), online tests (CAS),

knowledge to solve professional problems, taking into account modern advances in science and technology. PO07. Know and apply in practice the fundamental concepts, paradigms and basic principles of operation of language, tools and computing software engineering. PO15. Being motivated to choose programming languages and development technologies to solve problems of software design and maintenance. PLO18. Know and be able to apply information technology processing, storage and transmission of data. PO21. Know, analyze, select, skillfully apply the means of information security (including cybersecurity) and data integrity in accordance with the applied tasks and software systems.		final/semester control in the form of a semester exam, according to the schedule of the educational process (FAS)

ASSESSMENT AND GRADING

Ranges of points corresponding to grades

core (points) for all types of learning activities	ECTS grading scale	The national grading scale
90-100	A	excellent
82-89	B	good
74-81	C	
64-73	D	satisfactory
60-63	E	
35-59	FX	Unsatisfactory (with the exam retake option)
0-34	F	Unsatisfactory (with mandatory repetition of the course)

Allocation of grade points

100% Final assessment as a result of Final credit (30%) and Continuous assessment (70%).
30% Final credit
70% Continuous assessment:
Module №1 (10%)
Module №2 (20%)
Laboratory works (40%)
Laboratory work №1 (4%)
Laboratory work №2 (4%)
Laboratory work №3 (4%)
Laboratory work №4 (4%)
Laboratory work №5 (6%)
Laboratory work №6 (6%)
Laboratory work №7 (6%)
Laboratory work №8 (6%)

Course policy	Students must attend all classes according to the study schedule and adhere to the norms of academic ethics. To study the course, students need to have their personal computer and (or) use computers of the computer center at the department. Students must work with compulsory and recommended reading, including Internet resources. Students must complete and submit all laboratory works during the semester in which the course is taught, before the examination session. The final assessment is not carried out without the personal presence of students.

COURSE STRUCTURE AND CONTENT					
Topic 1	Basic concepts of cloud computing systems.	**Laboratory work 1**	Deploy ASP.NET Web Applications in Azure Application Service with Visual Studio.	**Self-study**	Classification of services provided by providers of information and communication resources: vision server, virtual hosting, virtual vision server, grid system.
Topic 2	Basic components of cloud computing.	**Laboratory work 2**	Deploy a database in Microsoft Azure.		Application and operating system layer virtualization
Topic 3	Stacks of cloud platforms.	**Laboratory work 3**	Creating a database in Microsoft Azure (infographic model, inquiries).		The concept of business model software for rent.
Topic 4	Microsoft Azure cloud platform. Features of the platform.	**Laboratory work 4**	Creating a database based on the IDEF1X model.		Technologies supported by the Microsoft Azure cloud.
Topic 5	SQL Server database migration to Microsoft Azure with Data Migration Assistant	**Laboratory work 5**	Creation and deployment web application tools Azure Devops (vsts) Microsoft Azure platform.		The Microsoft Azure cloud platform. Linear methods of machine learning.
Topic 6	Amazon infrastructure. Architecture and basic services.	**Laboratory work 6**	Construction of prognostic models in Microsoft Azure ML Studio (regression model).		AWS cloud supported technologies. Examples of application.
Topic 7	IBM Cloud infrastructure. Features of the platform. Architecture and basic services.	**Laboratory work 7**	Construction of prognostic models in Microsoft Azure ML Studio (model classification).		Classic IBM technologies for cloud solutions.

Topic 8	IBM Cloud infrastructure. Features of the platform. Watson Studio.	**Laboratory work 8**	Construction of prognostic models in Microsoft Azure ML Studio (clustering model).		IBM Watson Studio is a cloud platform for developing artificial intelligence applications.

RECOMMENDED READING

Compulsory

1. Petrenko, O. O., Petrenko, A. I. (2016). Modeling of service system architecture. Proceedings of the international conference "Modeling-2016". Kyiv.
2. Petrenko, A. I., Roenko, N. V. (2016). Personal healthcare platform for chronic diseases with mobile self-management support. The 4th International Virtual Conference on Advanced Scientific Results. Slovakia. Retrieved from: www.scieconf.com
3. Kopnyak, N, Korytska, G., Litvinova, S., Nosenko, Yu., Poida, S., Sedoy, V. …Shishkina, M. (2015). Modeling and integration of services of cloud-oriented learning environment: monograph. Kyiv: SP «Comprint».
4. Yashchuk, A. A., Savarin, P.V. (2016). Grid systems and technologies of cloud computing : lecture notes for the specialty 8.05010101 "Information control systems and technologies" full-time. Lutsk: Lutsk NTU.
5. Yenina, I. (2017). Protection ways of saving information in cloud services. Materials between people. scientific practice. conf. "Applied scientific and technical research". Academy of Technical Sciences of Ukraine (May 5, 2017). Ivano-Frankivsk: Symphony forte.

Recommended

6. Ray, Partha Pratim. (2018). "An Introduction to Dew Computing: Definition, Concept and Implications - IEEE Journals & Magazine". IEEE Access. 6: 723–737. doi:10.1109/ACCESS.2017.2775042. S2CID 3324933.
7. Montazerolghaem, Ahmadreza, Yaghmaee, Mohammad Hossein, Leon-Garcia, Alberto (September 2020). "Green Cloud Multimedia Networking: NFV/SDN Based Energy-Efficient Resource Allocation". IEEE Transactions on Green Communications and Networking, 4(3), 873–889. doi:10.1109/TGCN.2020.2982821. ISSN 2473-2400. S2CID 216188024.
8. Ristov, S., Cvetkov, K., Gusev, M. (2016). Implementation of a horizontal scalable balancer for dew computing services. Scalable Comput. Pract. Exper., 17(2), 79-90.
9. W. Shi, J. Cao, Q. Zhang, Y. Li Xu. (2016). Edge computing: Vision and challenges. IEEE Internet Things J., 3(5), 637-646.
10. Cloud computing: examples of use and benefits. Retrieved from://onbiz.biz/cloud-usage-examples/
11. Cloud computing and virtualization. Retrieved from: https://stud.com.ua/20576/informatika/hmarni_obchislennya_virtualizatsiya
12. What are cloud technologies and why they are needed. Retrieved from: https://edin.ua/shho-take-xmarni-texnologi%D1%97-i-navishho-voni-potribni/

Academic integrity

Students must adhere to the Code of Ethics of Academic Relations and Integrity of NTU "KhPI": to show discipline, politeness, friendliness, honesty, responsibility

The content of this syllabus is consistent with the course program.