Curriculum

Field of study: Cloud and DevOps Academy

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Postgraduate study programme

Basic information

Faculty name:	Faculty of Computer Science
Field of study:	Cloud and DevOps Academy
Level:	postgraduate
Number of ECTS credits necessary to complete studies at a given level:	36
Cycle start date:	2023/2024, winter semester
Duration of studies (number of semesters):	2

Recruitment conditions, including admission requirements

In order to enroll into program candidates must:
- have BS/MS diploma in engineering, IT, mathematics, or physics
- pass English test to confirm the required B2 level
- undergo the technical test and interview
- have experience with one of programming languages Java, JavaScript, C#, Python

Limit of admission to postgraduate studies along with an indication of the minimum number of people admitted, conditioning the launch of the edition of postgraduate studies

25 people (minimum 20)

Required documents and place of their submission

Required documents, i.e.
- application form;
- a copy of the university diploma certified by the University or the Diploma with the apostille for foreign students
- confirmation of the payment of the registration fee in the amount of PLN 500;
- confirmation of payment of the fee (or the first installment if approved by the head of the programm) for postgraduate studies for the first semester of studies, not later than within 14 days before starting the postgraduate studies should be submitted:
- electronically by e-mail to siwik@agh.edu.pl
And physically to the Secretariat of the Institute of Computer Science
AGH University of Science and Technology, Kawiory 21 st., Mld. D-17, Room 2.7

General goals of education within postgraduate studies

The main goals of the studies is to learn:
• DevOps methodology principles, assumptions, tools, and approaches
• software development lifecycle
• advanced Linux and Windows administration and management
• the basics of Python for DevOps
• computer networks concepts and approaches
• CI/CD tool-sets
• essentials of AWS infrastructure, tools, resources and services
• essentials of Azure infrastructure, tools, resources and services
• essentials of GCP infrastructure, tools, resources and services
• Terraform basic concepts, use cases, worklow, structure, syntax and modules
• Ansible architecture, connection types, inventory, playbook composition, tasks, modules and ad-hoc commands
• Docker architecture and application design
• Kubernetes' main functions, concepts, workflows, cluster and high-availability architecture

• DevOps Securuity challenges
• secure SDLC methodology and concepts
• security tools for code scanning, vulnerability assessing and security state verification in clouds

Postgraduate studies graduate profile

The graduate will be a person who:
• knows the DevOps KPIs and understands the DevOps methodology
• is able to keep the development lifecycle in an efficient manner
• has grounded skills in modern VCSs and Git as one of the most popular one
• obtains and improves skills in Windows and Linux administration and management
• obtains the basic knowledge of Python for DevOps
• has grounded knowledge of computer networks concepts and approaches
• is able to use CI/CD tool-sets effectively and knows how to automate the software development process and ensure quality and safety for continuous compliance
• has deep knowledge of cloud-based solutions that allow companies to scale their business and simultaneously enhance their efficiency by reducing costs and losses, providing predictable, stable maintenance and a reliable level of security
• knows essential AWS services
• has hands-on experience with managing resources in AWS
• has grounded knowledge of managing the infrastructure resources in AWS
• knows how to take advantage of selected virtualization services in Azure and use Azure storage and database services
• is able to choose and apply appropriate tools and services for building modern solutions for Azure cloud
• knows essential GCP services
• has hands-on experience with managing resources in GCP
• has grounded knowledge of managing the infrastructure resources in GCP
• knows how to deploy applications in GCP
• knows Terraform basic concepts, use cases and worklow
• has basic knowledge of Terraform syntax, structure of Terraform modules and functions of Terraform language, as well as know Terraform behaviour and features
• has basic knowledge of Ansible architecture, connection types, inventory, playbook composition, tasks, modules and ad-hoc commands
• has basic knowledge of secrets and cloud management with Ansible
• has grounded knowledge of Docker's architecture and application design
• develops skills to apply Docker for software development and lifecycle management
• has the basic knowledge of Kubernetes' main functions, basic concepts, and cluster and high-availability architecture
• is able to apply Kubernetes for basic infrastructure workflows and configurations
• knows DevOps Securuity challenges
• knows Secure SDLC methodology and concepts to build safe infrastructure and basic security frameworks
• is able to use security tools for code scanning, vulnerability assessing and verifying security state in cloud.

Rules for completing postgraduate studies, including the rules of participation in classes, rules for controling classes and rules for taking exams, rules for crediting and registering for the next semester

Cloud and DevOps Academy is a two-semester postgraduate study. The program is run fully in English and fully in online mode.
This course combines self-study materials, lectures, webinars, workshops, practical tasks, mentoring, and tasks done within a real project. The materials will be provided on the digital platform to let students study them reasonably and comfortably. The digital materials for self-paced study include texts, video recordings, infographics, and quizzes to provide different channels of information absorption.
Practical tasks include use cases closely related to professional daily activities. Students are also involved in collaborative activities to improve their team-working skills. Regardless of the form of the tasks, students will get personalized feedback on their practice tasks and progress. Quizzes in the program's modules let students focus on the most important aspects and components.
The final test and project-based practice let students consolidate gained knowledge and skills.

To complete the program, students must:
- participate in online lectures, webinars, workshops, and mentoring sessions,
- complete practical tasks
- complete project
- pass the final test

The duration rules and form of internships, including in particular the conditions for their implementation, the internship control system and their control (if required)

Cloud and DevOps Academy is a two-semester postgraduate study. Program consists of three main parts (Cloud and DevOps Academy Part I, Cloud and DevOps Academy Part I Part II andCloud and DevOps Academy - Project-based training) each of which lasts three months.

Conditions for completing postgraduate studies and obtaining a certificate of completion of postgraduate studies, including the conditions and requirements related to the preparation of final papers and the implementation of the diploma process, as well as related to the organization and course of the final exam (its scope, mode and manner of its conduct, rules for determining the exam grade) final, guidelines for its course), if required, the rules for determining the final result of their completion

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Learning outcomes

Field of study : Cloud and DevOps Academy

Knowledge

KEU symbol	Learning outcomes prescribed to a field of study	CEU symbol
CDASP_W01	Student knows and understands the terms and concepts related to the DevOps methodology	P6S_WG
CDASP_W02	Student knows and understands software development lifecycle	P6S_WG
CDASP_W03	Student knows and understands the principles and operation models of modern version control systems (in particular the GIT system)	P6S_WG
CDASP_W04	Student knows and understands advanced techniques of administration and management of Windows and Linux operating systems	P6S_WG
CDASP_W05	Student knows and understands the basics of Python for DevOps methodology	P6S_WG
CDASP_W06	Student knows and understands the basic concepts, assumptions and protocols of computer networks	P6S_WG
CDASP_W07	Student knows and understands the basic assumptions and tools of CI/CD	P6S_WG
CDASP_W08	Student knows and understands how to build and automate software development processes based on cloud solutions	P6S_WG
CDASP_W09	Student knows and understands the basic services, tools and resources of the AWS cloud	P6S_WG
CDASP_W10	Student knows and understands the basic services, tools and resources of the Azure cloud	P6S_WG
CDASP_W11	Student knows and understands the basic services, tools and resources of the GCP cloud	P6S_WG
CDASP_W12	Student knows and understands the basic concepts, use cases, workflow structure, syntax and modules of the Terraform platform	P6S_WG
CDASP_W13	Studen knows how to work effectively with the Ansible platform	P6S_WG
CDASP_W14	Studen knows how to work effectively with the Docker platform	P6S_WG
CDASP_W15	Studen knows how to work effectively with the Kubernetes platform	P6S_WG
CDASP_W16	Student knows and understands the security challenges and threats in the context of the DevOps methodology	P6S_WG

Skills

KEU symbol	Learning outcomes prescribed to a field of study	CEU symbol
CDASP_U01	Student is able to apply the DevOps methodology in practice	P6S_UW
CDASP_U02	Student is able to use version control systems in practice (in particular the GIT system)	P6S_UW
CDASP_U03	Student is able to manage Windows and Linux operating systems	P6S_UW
CDASP_U04	Student is able to use Python for DevOps methodology	P6S_UW
CDASP_U05	Student is able to make basic configurations of computer networks' protocols and connections	P6S_UW

KEU symbol	Learning outcomes prescribed to a field of study	CEU symbol
CDASP_U06	Student is able to use CI/CD tools and practices in practice	P6S_UW
CDASP_U07	Student is able to automate software development processes based on cloud solutions in practice	P6S_UW
CDASP_U08	Student is able to use, apply and work in practice with AWS cloud services, tools and resources	P6S_UW
CDASP_U09	Student is able to use, apply and work in practice with Azure cloud services, tools and resources	P6S_UW
CDASP_U10	Student is able to use, apply and work in practice with GCP cloud services, tools and resources	P6S_UW
CDASP_U11	Student is able to use, apply and work in practice with the Terraform platform	P6S_UW
CDASP_U12	Student is able to use, apply and work in practice with the Ansible platform	P6S_UW
CDASP_U13	Student is able to use, apply and work in practice with the Docker platform	P6S_UW
CDASP_U14	Student is able to use, apply and work in practice with the Kubernetes platform	P6S_UW
CDASP_U15	Student is able to find, analyze and solve in practice security threats (including cloud solutions) in the context of the DevOps methodology	P6S_UW

Social competence

KEU symbol	Learning outcomes prescribed to a field of study	CEU symbol
CDASP_K01	Student is ready for critical assessment of own knowledge and new solutions and techniques in the field of DevOps methodology	P6S_KK
CDASP_K02	Student is ready to use the acquired knowledge to achieve important goals for society or to conduct entrepreneurial activities	P6S_KO
CDASP_K03	Student is ready to work in the compliance of the law and ethical principles in projects related to DevOps methodology	P6S_KR
CDASP_K04	Student is ready to encourage culture of innovations in the organization	P6S_KR