

System Administration (E765025)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 170 h**

Course offerings and teaching methods in academic year 2023-2024

A (semester 2)	Dutch	Gent	lecture seminar
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Lecturers in academic year 2023-2024

Volckaert, Bruno	TW05	lecturer-in-charge
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Offered in the following programmes in 2023-2024

Master of Science in Information Engineering Technology	crdts	offering
	6	A

Teaching languages

Dutch

Keywords

Windows Server, Powershell, Active Directory, System administration, Infrastructure as Code, Cloud

Position of the course

Thorough study of modern usage and management of systems in datacenters and clouds

Contents

- Windows Server
- Powershell
- Desired State Configuration (DSC)
- Active Directory, Active Directory Federation Services (ADFS), Azure AD
- File systems
 - Cloud file systems like OneDrive, Google drive
 - Storage virtualisation, Software Defined Storage, distributed storage, IOPS, redundancy (SAN, NAS, archiving, object storage, etc.)
- Cloud
 - IAAS, PAAS, SAAS, FAAS, MAAS
 - Public cloud (e.g. Amazon AWS / Google Cloud / Microsoft Azure)
 - Private cloud
 - Hybrid cloud
- Virtualisation
 - Hypervisors (e.g. VSphere, VMWare, Esxi, Hyper-V, KVM)
 - Storage management (e.g. LUNS / storage arrays / vplex)
 - Backup and disaster recovery (strategies and concepts)
 - High availability
 - Containers and container orchestration (advanced concepts): Docker, Kubernetes, OpenShift
 - Scripting: automation, logging
- Monitoring: alerting – metrics (e.g. SCOM Microsoft, Zabbix, ELK stack: Elasticsearch / Logstash / Kibana, Telegraf/Influxdb/Grafana)
- Patch management
- Automation, configuration management (e.g. Ansible, Saltstack)
- Provisioning tools (e.g. Puppet / Chef)
- Infrastructure as Code (e.g. Terraform or AWS CloudFormation)
- Remote execution
- ITIL4

Initial competences

- Knowing the basic principles of computer architecture and of the architecture of operating systems.
- Being able to configure network interfaces.
- Being able to use and debug static and dynamic IP routing, in mixed IPv4/IPv6 environments.

Final competences

- 1 Being able to configure Windows Server systems and manage them by means of Powershell
- 2 Being able to manage and configure file systems (local / cloud)
- 3 Knowledge of IaaS, PaaS, SaaS, FaaS and MaaS Cloud-concepts and advanced virtualisation techniques
- 4 Being able to apply Infrastructure as Code and automation tools
- 5 Being able to configure and deploy a monitoring stack for system administration

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, Seminar, Lecture

Extra information on the teaching methods

Lecture, seminar: practical PC room classes (or on a laptop)

Learning materials and price

Slides on the electronic learning platform

References

Windows Server 2019 Inside Out, Orin Thomas, 5/26/2020, 1st Edition, ISBN 978-0-13549227-7

Course content-related study coaching

Interactive support via the electronic learning environment; assistant-guided labs; contact with professor and assistants through mailing list and personally by means of an appointment.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment

Examination methods in case of periodic assessment during the second examination period

Written assessment

Examination methods in case of permanent assessment

Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

- First term:
 - PE1: written exam with open questions
 - NPE1: evaluation of result labs based on report / scripts
- Second term:
 - PE2: written exam with open questions
 - NPE2: evaluation of result labs based on report / scripts

Calculation of the examination mark

- 50% of the final grade is determined by the answers to the written exam
- 50% of the final grade is determined by evaluation of the result of the labs
- To pass, a student needs to receive at least 9/20 for both the PE and NPE. If this is not the case and the calculated result is 10 or more, the final grade will be changed and the student receives 9/20.

