



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:

SISTEMSKA ADMINISTRACIJA

Course title:

SYSTEM ADMINISTRATION

Študijski program in stopnja
Study programme and level

Študijska smer
Study field

Letnik
Academic year

Semester
Semester

PREDMETNI UČITELJ Enovit magistrski študijski program druge stopnje	PREDMETNI UČITELJ	4.	8.
SUBJECT TEACHER Five-year master's degree program Subject Teacher	SUBJECT TEACHER		

Vrsta predmeta / Course type

Obvezni / Compulsory

Univerzitetna koda predmeta / University course code

UR14

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	0	45	0	0	75	5

Nosilec predmeta / Lecturer:

JANEZ BREST

Jeziki /

Predavanja / Lectures:

Slovenščina / Slovene

Languages:

Vaje / Tutorial:

Slovenščina / Slovene

**Pogoji za vključitev v delo oz. za opravljanje študijskih
obveznosti:**

Prerequisites:

• Ni pogojev

• None

Vsebina:

- Uvod: operacijski sistemi, aplikacije, administrativna opravila.
- Nameščanje, konfiguriranje in upravljanje operacijskih sistemov.
- Skriptno programiranje: primeri bash, ...
- Storitve, ki jih ponuja internet: upravljanje storitev, konfiguriranje storitev.
- Upravljanje in konfiguriranje: upravljanje in konfiguriranje omrežij, upravljanje in konfiguriranje stikal in usmerjevalnikov, upravljanje in konfiguriranje mobilnih omrežij.
- Upravljanje računalniških sistemov in podatkovnih baz.
- Računalniška varnost, pogoste napake pri programiranju.
- Programska oprema: programska oprema za analizo omrežnega prometa, programska oprema za ugotavljanje vdorov.
- Kriptografija.
- Uporabniki: tehnična podpora uporabnikom.
- Odpornost na napake: metode, študij primerov.

Content (Syllabus outline):

- Introduction: operating systems, applications, administrative activities.
- Installation, configuration and management of operating systems.
- Script programming: examples: bash, ...
- Internet services: service management, service configuration.
- Management and configuration: networks management and configuration, management and configuration of switches and routers, management and configuration of mobile networks.
- Management of computer systems and databases.
- Computer security, common programming mistakes.
- Software: software tools for network traffic analysis, intrusion detection systems.
- Cryptography.
- Users: technical support.
- Fault tolerance: methods, case study.

Temeljna literatura in viri / Readings:

- M. Burgess: Principles of Network and System Administration, Second Edition, John Wiley & Sons, Ltd, West Sussex, 2004
- Nemeth, E. (2018). UNIX and Linux system administration handbook (5th ed., p. XLVI, 1180). Addison-Wesley.
- Matotek, D., Turnbull, J., & Lieverdink, P. (2017). Pro Linux System Administration. Apress. <https://doi.org/10.1007/978-1-4842-2008-5>
- Stallings, W. (2013). Koncepti operacijskih sistemov z Linuxovo lupino in programiranjem v Bashu (Custom book ed., p. VIII, 795). Pearson.
- Binnie, C. (2016). Linux Server security: hack and defend (p. XVIII, 126). Wiley.

Cilji:

Cilj predmeta je seznaniti študente z osnovnimi principi sistemske administracije in varnosti

Objectives:

The objective of this course is to acquaint students with the basic principles of computer system administration and security

Predvideni študijski rezultati:Znanje in razumevanje:

- prikazati sposobnost namestitve vsaj enega izmed operacijskih sistemov
- izkazati sposobnost vzdrževanja različnih operacijskih sistemov
- ločevati med storitvami na serverju in odjemalcu
- uporabiti različne operacijske sisteme in analizirati ter priporočati določen operacijski sistem za določene potrebe
- identificirati, opisati in analizirati situacije, kjer so potrebne administrativne aktivnosti

Prenosljive/ključne spretnosti in drugi atributi:

- Spretnosti komuniciranja: ustni zagovor laboratorijskih vaj, pisno izražanje pri pisnem izpitu.
- Uporaba informacijske tehnologije: uporaba programskih orodij in skript za avtomatizacijo opravil v sistemske administraciji.
- Reševanje problemov: načrtovanje, namestitve in vzdrževanje računalniških sistemov.

Intended learning outcomes:Knowledge and understanding:

- illustrate the ability to install at least one operating system
- demonstrate the ability to support various operating systems
- distinguish between server and client services
- demonstrate knowledge and understanding of various operating systems, analyse and recommend a particular operating system to satisfy given needs
- identify, describe and analyse situations, which interfere with administrative activities

Transferable/Key skills and other attributes:

- Communication skills: oral lab work defence, manner of expression at written examination.
- Use of information technology: use of software tools and scripts to automate routine tasks in system administration.
- Problem solving: designing, installing and managing of computer systems

Metode poučevanja in učenja:

- Predavanja: pri predavanjih študentje spoznajo teoretične vsebine predmeta. Predavanja se izvajajo kot klasična predavanja v frontalni obliki z diskusijo ob primerih uporabe sistemske administracije.
- Seminarske vaje: pri seminarskih vajah se študentje seznajajo s potekom računalniških vaj.
- Računalniške vaje: pri računalniških vajah študentje uporabljajo usvojeno znanje na konkretnih problemih.

Learning and teaching methods:

- Lectures: in lectures students get to know the theoretical contents of the course. Lectures are conducted as classical lectures in frontal form interleaved with discussions on practical examples of system administration.
- Tutorials: in tutorial exercises students are informed about lab work.
- Lab work: in laboratory exercises students work on individual programming tasks.

Načini ocenjevanja:

Računalniško delo - 50%
Pisni izpit - 50%

Assessment:

Computer skills - 50%
Written exam - 50%

Opombe: Pisni izpit se lahko nadomesti s kolokviji v enakem deležu 50 %.

Comments: The exam may be replaced by midterm examinations in the weight of 50 %.

Reference nosilca / Lecturer's references:

- HERZOG, Jana, BREST, Janez, BOŠKOVIČ, Borko. Analysis based on statistical distributions: A practical approach for stochastic solvers using discrete and continuous problems. Information Sciences. [Online ed.]. Available online 15 March 2023, 49 str. ISSN 1872-6291. DOI: 10.1016/j.ins.2023.03.081. [COBISS.SI-ID 145298947]
- POPIČ, Jan, BOŠKOVIČ, Borko, BREST, Janez. Improving mutation strategies in differential evolution with a new pbest selection mechanism. Applied soft computing. [Online ed.]. Dec. 2025, vol. 185, part b, [article no.] 113978, 17 str., ilustr. ISSN 1872-9681. <https://dk.um.si/IzpisGradiva.php?id=95839>, DOI: doi.org/10.1016/j.asoc.2025.113978. [COBISS.SI-ID 255045123] project: The authors acknowledge the financial support from the Slovenian Research and Innovation Agency (Research Core Funding No. P2-0041 – Computer Systems, Methodologies, and Intelligent Services).
- PŠENIČNIK, Blaž, MLINARIČ, Rene, BREST, Janez, BOŠKOVIČ, Borko. Dual-step optimization for binary sequences with high merit factors. Digital signal processing. Oct. 2025, vol. 165, [article no.] 105316, 9 str., ilustr. ISSN 1095-4333. DOI: 10.1016/j.dsp.2025.105316. [COBISS.SI-ID 236425219] project: The authors (J.B. and B.B.) acknowledge the financial support from the Slovenian Research and Innovation Agency (Research Core Funding No. P2-0041 -- Computer Systems, Methodologies, and Intelligent Services). The authors would like to acknowledge the Slovenian Initiative for National Grid (SLING) for using computational resources for performing some experiments in this paper.
- BREST, Janez, SEPESY MAUČEC, Mirjam. Comparative study of modern differential evolution algorithms : perspectives on mechanisms and performance. Mathematics. 2025, vol. 13, iss. 10, [article no.] 1556, 21 str. ISSN 2227-7390. DOI: 10.3390/math13101556. [COBISS.SI-ID 235619075] project: This work was supported by the Slovenian Research and Innovation Agency (research core funding No. P2-0069—Advanced Methods of Interaction in Telecommunications and P2-0041— Computer Systems, Methodologies, and Intelligent Services).