

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Operacijski sistemi
Course title: Operation Systems

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Informatika v sodobni družbi, visokošolski strokovni in univerzitetni študijski program prve stopnje	-	Drugi ali tretji	Četrty ali šesti
Informatics in Contemporary Society, first cycle Professional Study Programme and Academic Study programme	-	Second or third	Fourth or sixth

Vrsta predmeta / Course type

Izbirni / Elective

Univerzitetna koda predmeta / University course code:

1-ISD-VS,UN-IP-OS-2016-10-01

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	-	15	-	30	105	6

Nosilec predmeta / Lecturer:

Jeziki / Languages:

Predavanja / Lectures:

Slovenski, angleški / Slovene, English

Vaje / Tutorial:

Slovenski, angleški / Slovene, English

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

Študent/študentka mora pred pristopom k izpitu tekoče izpolnjevati obveznosti z vaj ter pripraviti in uspešno zagovarjati svoj projekt.

Prerequisites:

The prerequisite is enrolment into the first year of the study. Student has to pass all requirements given at the exercises, defend the homeworks, and prepare and defend the seminar work.

Vsebina:

- Uvod in osnovni pojmi.
- Upravljanje procesov (procesni komunikacija med njimi, niti, razporejanje, sinhronizacija, smrtni objem).
- Upravljanje pomnilnika (glavni pomnilnik, navidezni pomnilnik).
- Shranjevanje podatkov (datotečni sistemi, vmesniki za dostop do njih, izvedba in upravljanje, masovno shranjevanje, vhodno izhodni sistemi).
- Zaščita in varnost sistema (dodeljevanje in upravljanje pravic, grožnje in obramba, uporaba kriptografije in požarnih pregrad ..).
- Porazdeljeni sistemi (porazdeljene strukture, datotečni sistemi, koordinacijski mehanizmi).
- Primerjava dveh večjih (eden temelječ na Windows in drugi na Unix osnovi) in enega manjšega operacijskega sistema (npr. Symbian).

Content (Syllabus outline):

- Introduction to operating systems (OS): and basic OS terms.
- Management of processes (processes and communication between them, threads, scheduling, synchronization, deadlocks).
- Memory management (main memory, virtual memory).
- Data management (file systems, interfaces to data access, execution and management, mass storage, input and output).
- Protection and Safety System (allocation and management of rights, threats and defence, the use of cryptography and firewalls ..).
- Distributed systems (distributed structure, file systems, coordination mechanisms).
- Comparison of the two major (one based on Windows and other Unix based), and a small operating system (eg. Symbian).

Temeljni literatura in viri / Readings:

- SILBERSCHATZ, Avi, GALVIN, Peter Baer, GAGNE, Greg. Operating System Concepts, 7. izdaja, John Wiley & Sons 2004.
- TANENBAUM, Andrew S. Modern Operating Systems, 3. izdaja, Prentice Hall 2007.

Cilji in kompetence:

Učna enota prispeva k razvoju naslednjih splošnih in predmetno-specifičnih kompetenc:

- razvoj kritične in samokritične presoje
- sposobnost za reševanje konkretnih problemov z uporabo znanih orodij in metod
- sposobnost uporabe informacijsko-komunikacijske tehnologije in sistemov na različnih področjih
- razvoj veščin in spretnosti pri uporabi znanja na področju tehničnih ved s pomočjo reševanja teoretičnih ali empiričnih problemov

Objectives and competences:

The instructional unit contributes to the development of the following general and subject-specific competences:

- development of critical and self critical evaluation
- competence for solving specific problems with the use of known tools and methods
- the competence to use information communication technology and systems in various fields.
- development of abilities and skills for the use of knowledge in the field of technical sciences with the aid of solving theoretic or empirical problems

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent/študentka:

- se seznani z osnovnimi zakonitostmi operacijskih sistemov, ki stojijo za vsakim računalniškim sistemom
- poglobljeno razume zgradbo in delovanje računalnika
- spozna mehanizme, ki (med drugim) omogočajo delovanje sodobnih visoko zmogljivih aplikacij
- razume kompleksnost problemov, ki jih mora reševati sodoben operacijski sistem (večpredstavnost, hitra omrežja, večje število procesorjev, hitra obdelava ogromne količine podatkov...)
- pozna in razume varnostna tveganja operacijskega sistema in se zaveda omejitev, ki jih postavlja odpravljanje tveganj zgolj na nivoju operacijskega sistema
- uporablja dva prevladujoča operacijska sistema

Intended learning outcomes:

Knowledge and understanding:

The student:

- becomes familiar with the basic laws of operating systems that stand behind every computer system
- will thoroughly understand the structure and functioning of the computer
- learn about the mechanisms that (among other things) allow for the functioning of modern high-performance applications
- understands the complexity of the problems to be solved by a modern operating system (multimedia, high-speed network, increasing the number of processors, high-speed processing of massive amounts of data ...)
- knows and understands the safety risks of operating system and is aware of the limitations imposed by addressing risks only at the level of the operating system
- uses two well-known operating systems

Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov)
- *vaje*, kjer bodo študentje pri konkretnih problemih ponovili, utrdili in dodatno osvetlili pojme in metode, spoznane na predavanjih
- *vaje v računalniški učilnici*: pri teh vajah bodo študentje spoznali konkretne protokole in orodja, o katerih so se učili na predavanjih. te vaje bodo potekale v manjših skupinah, tako da bo imel vsak študent na razpolago en računalnik
- *projekt*: v okviru samostojnega dela ali dela v parih bo študent samostojno preučil določeno vsebinsko področje ali rešil konkreten problem ter ga ustrezno predstavil

Learning and teaching methods:

- *lectures* with active student participation (explanation, discussion, questions, examples, problem solving)
- *tutorials* where students will rehearse, revise and lit up concepts, and methods encountered at lectures
- *tutorials in computer labs*, during which students will learn about specific protocols and tools that have been learned in class. these exercises will take place in small groups so that each student will have available a single computer
- *seminar work*, is an individual assignment for each student, in order to independently examine a specific subject or solve a specific problem, and present it to the rest of the class

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt): • pisni izpit • projekt • vaje	50 20 30	Type (examination, oral, coursework, project): • written exam • project • tutorials