### COURSE DESCRIPTION

<table>
<thead>
<tr>
<th>Nr</th>
<th>Learning outcomes description</th>
<th>Method of assessment</th>
<th>Teaching methods</th>
<th>Learning outcomes reference code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Student acquires knowledge on fundamentals of specific and distributed operating systems operating systems</td>
<td>final test</td>
<td>lecture</td>
<td>K1A_W10 K1A_W11 K1A_W13 K1A_W14 K1A_W13</td>
</tr>
<tr>
<td>2</td>
<td>Student acquires practical knowledge about Linux and Windows operating systems</td>
<td>laboratory tasks</td>
<td>laboratory</td>
<td>K1A_U08 K1A_U21 K1A_U29</td>
</tr>
<tr>
<td>3</td>
<td>Student acquires practical knowledge and basic skills in configuring operating systems for server-related tasks</td>
<td>laboratory tasks</td>
<td>laboratory</td>
<td>K1A_U19 K1A_U21</td>
</tr>
<tr>
<td>4</td>
<td>Student acquires knowledge and basic skills in administering and managing server operating systems</td>
<td>laboratory tasks</td>
<td>laboratory</td>
<td>K1A_U10 K1A_U19 K1A_U21</td>
</tr>
<tr>
<td>5</td>
<td>Student acquires knowledge and basic skills in reading reference literature and technical documentation</td>
<td>laboratory tasks</td>
<td>laboratory</td>
<td>K1A_U01</td>
</tr>
</tbody>
</table>
18. **Teaching modes and hours**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Classes</th>
<th>Laboratory</th>
<th>Project</th>
<th>BA/MA Seminar</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>-</td>
<td>30</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

19. **Syllabus description:**

**Lectures:**

The aim of the course is to introduce students to the concepts of general and specific-purpose operating systems, their functions, architectures, resource management methods, process synchronization, file systems and communication protocols. Subject covers the basic concepts of distributed (network) operating systems and specific-purpose systems such as virtualization systems, real-time operating systems, multimedia operating systems and distributed systems. In particular, the following aspects of operating systems are discussed: problems of time management in distributed, real-time and multimedia operating systems. Techniques of clock synchronization in computer systems. Resource management methods, scheduling and synchronization in distributed and specific-tasks operating systems. Issues related to security and reliability of operating systems. Real-time processes and processing time requirements. Selected algorithms dedicated to processor and memory management in real-time and distributed systems. QNX as an example of real-time operating system. Concepts of virtualization systems including details about Xen Hypervisor. Basic concepts related to multimedia operating systems. Multimedia streaming, compression, QoS (quality of service) parameters. Multimedia operating systems requirements, methods of processor and memory management. Basic concepts, function and architecture of embedded operating systems.

**Laboratory:**

1. Linux - access control list (ACL)
2. Programming in Linux
3. Linux - dualboot configuration
4. Linux - event logging and system security
5. Linux - X-Window System
6. Linux - kernel
7. Windows - remote installation
8. Windows - Active Directory
9. Windows - application programming interface (API)
10. Windows - PowerShell framework
11. Windows - RAID data storage
12. Windows - event logging

20. **Examination:** no

21. **Primary sources:**


22. **Secondary sources:**

5. Linux manual
8. Internet documentation, np.: debian.org, linuxquestions.org
23. Total workload required to achieve learning outcomes

<table>
<thead>
<tr>
<th>Lp.</th>
<th>Teaching mode:</th>
<th>Contact hours / Student workload hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lecture</td>
<td>30/5</td>
</tr>
<tr>
<td>2</td>
<td>Classes</td>
<td>----</td>
</tr>
<tr>
<td>3</td>
<td>Laboratory</td>
<td>30/15</td>
</tr>
<tr>
<td>4</td>
<td>Project</td>
<td>----</td>
</tr>
<tr>
<td>5</td>
<td>BA/ MA Seminar</td>
<td>----</td>
</tr>
<tr>
<td>6</td>
<td>Other</td>
<td>10/10</td>
</tr>
<tr>
<td></td>
<td>Total number of hours</td>
<td>70/30</td>
</tr>
</tbody>
</table>

24. Total hours: 100

25. Number of ECTS credits: 3 (1 - sem. 5, 2 – sem 6)

26. Number of ECTS credits allocated for contact hours: 2

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 1

26. Comments:

Approved:

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(date, Instructor’s signature) (date, the Director of the Faculty Unit signature)