1. Course title: OPERATING SYSTEMS

2. Course code: OS


4. Level of studies: BA, BSc programme

5. Mode of studies: INTRAMURAL STUDIES

6. Field of study: INFORMATICS

7. Profile of the studies: comprehensive

8. Specialty: ALL

9. Semester: IV, V

10. Faculty teaching the course: Faculty of Automatic Control, Electronics and Computer Science

11. Course instructor: Błażej Adamczyk
   Laboratory course instructor: Aleksandra Gruca

12. Course classification: common courses

13. Course status: obligatory

14. Language of instruction: English

15. Pre-requisite qualifications: Theory of computer science, Fundamentals of computer programming

16. Course objectives: The goal of the course is to introduce students into the subject of modern operating systems that are considered as robust resource management environment and user interface layer. During this course students will obtain the basic knowledge on configuring and administering of operating systems and solving classical resource management problems with a particular focus on processor and memory related tasks.

17. Description of learning outcomes:

<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 of fundamentals on general purpose operating systems</td>
<td>exam, final test</td>
<td>lecture</td>
<td>K1A_W10 K1A_W11 K1A_W14 K1A_W16</td>
</tr>
<tr>
<td>2.</td>
<td>Student acquires practical knowledge about Linux and Windows operating systems</td>
<td>laboratory task</td>
<td>laboratory</td>
<td>K1A_U08 K1A_U21 K1A_U29</td>
</tr>
<tr>
<td>3.</td>
<td>Student acquires knowledge and basic skills in installation and configuring operating systems</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 operating systems and managing its resources</td>
<td>laboratory tasks</td>
<td>laboratory</td>
<td>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>

Lectures
Topics are related to the general purpose operating systems and to the general problems present in any kind of modern operating systems:

1. Basic operating systems concepts such as definition and fundamental functionality, efficiency criteria, processes, resources, types and architectures of operating systems
2. Structure of operation systems, kernel, drivers, tools, subsystems, interfaces and utilities
3. Resource and process management: inter-process communication (IPC), concurrency, interference, mutual exclusion, process synchronization and communication means, semaphores, mailboxes
4. Algorithms and mechanisms of CPU time sharing
5. Memory organization and allocation, virtual memory, memory protection
6. I/O devices management in operating systems
7. File systems – physical and logical representation
8. Hard disk head movement planning
9. Fundamental concepts or real-time and distributed operating systems
10. Description of Windows and Linux operating systems

Laboratory:
1. Linux - installation and basic configuration
2. Linux - users, groups and permissions
3. Linux - basics of bash programming
4. Linux - software management
5. Linux - network configuration
6. Linux - processes
7. Windows - installation
8. Windows - users, groups and permissions
9. Windows - basic configuration
10. Windows - network configuration
11. Windows - system services
12. Windows - remote access

19. Examination: yes (written)

20. Primary sources:

21. Secondary sources:
5. Linux manual
8. Dokumentacja w internecie, np.: debian.org, linuxquestions.org

22. 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>30/20</td>
</tr>
<tr>
<td>2.</td>
<td>Classes</td>
<td>-/</td>
</tr>
<tr>
<td>3.</td>
<td>Laboratory</td>
<td>30/30</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>
</tbody>
</table>

Total number of hours: 70/60
<p>| | |</p>
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<tr>
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</thead>
<tbody>
<tr>
<td>23. Total hours:</td>
<td>130</td>
</tr>
<tr>
<td>24. Number of ECTS credits:</td>
<td>5(3 - sem.4; 2 - sem.5)</td>
</tr>
<tr>
<td>25. Number of ECTS credits allocated for contact hours:</td>
<td>3</td>
</tr>
</tbody>
</table>
| 26. Number of ECTS credits allocated for in-practice hours  
(laboratory classes, projects): | 2 |
| 27. Comments: | - |

Approved:

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

1 ECTS credit – 25-30 student workload hours