

### DESCRIPTION OF A STUDY COURSE – SYLLABUS

|   |   |                 |  |                     |   |
|---|---|-----------------|--|---------------------|---|
| <b>Title of a course</b>  | <b>Operating Systems</b>  |                 |  |                     |   |
| <b>Head of course</b>   | <b>PhD Bernard Vukelić, College Professor</b>   |                 |  |                     |   |
| <b>Study programme</b>  | <b>Professional undergraduate study Information Science</b>   |                 |  |                     |   |
| <b>Status of a course</b>   | Obligatory  |                 |  |                     |   |
| <b>Year of study</b>  | 2   | <b>Semester</b> | III  | <b>ECTS credits</b> | 6 |
| <b>Teaching plan<br/>(L + E + S+ Pr)</b>  | 2+3+0+0   |                 |  |                     |   |
| <b>Goals of a course</b>  |   |                 |  |                     |   |
| The aim of the course is to gain knowledge about operating system concepts, their purpose and the mechanisms by which they are realized. Students will apply the adopted methods and techniques to practical assignments.   |   |                 |  |                     |   |
| <b>Conditions for enrolling course</b>  |   |                 |  |                     |   |
| Completed Computer Hardware course  |   |                 |  |                     |   |
| <b>Learning outcomes on a level of a study programme which includes course</b>  |   |                 |  |                     |   |
| Outcome 1: Describe the architecture and working principle of computers and components, and the basic features of operating systems.  |   |                 |  |                     |   |
| Outcome 12: Apply engineering methods and principles in information science.  |   |                 |  |                     |   |
| <b>Expected learning outcomes on a level of a course</b>  |   |                 |  |                     |   |
| <ol style="list-style-type: none"> <li>1. Define basic concepts and characteristics of operating systems.</li> <li>2. Describe the structure of operating systems.</li> <li>3. Apply algorithms for the allocation of processors to processes, as well as synchronization algorithms among them, across multiple systems.</li> <li>4. Apply algorithms for the operation of working, virtual and secondary memory.</li> <li>5. Describe the elements of operating systems in the operation of I/O devices.</li> </ol>   |   |                 |  |                     |   |
| <b>Content of a course</b>  |   |                 |  |                     |   |
| <p>Operating systems as an integral part of the computer. Classification of the operating system. Definition and types of operating systems. Functions and characteristics. History, development, set up and operation. Interrupt processing. Parallel processes. Structure of operating system. Memory management, control of input and output devices, databases and processors. Distributed systems. Main characteristics and comparison of the most popular operating systems. Development trends.</p> <p>Exercises are carried out in groups of students. Through discussions students note the differences between various operating systems (MS Windows, OS/2, Unix)</p> |   |                 |  |                     |   |
| <b>Teaching modes</b>   | <input checked="" type="checkbox"/> lectures<br><input type="checkbox"/> auditory exercises<br><input checked="" type="checkbox"/> seminars and workshops<br><input type="checkbox"/> distance learning<br><input type="checkbox"/> field classes |                 | <input checked="" type="checkbox"/> individual assignments<br><input type="checkbox"/> multimedia and network<br><input type="checkbox"/> laboratory<br><input type="checkbox"/> supervisor's work<br><input type="checkbox"/> other _____ |                     |   |
| <b>Comments</b>   |   |                 |  |                     |   |
| <b>Students' obligations</b>  |   |                 |  |                     |   |
| Submit homework and present it.   |   |                 |  |                     |   |
| <b>Grading, evaluation and monitoring of students' work continuously during lectures and exams</b>  |   |                 |  |                     |   |
| Grading is based upon evaluation of course's learning outcomes' adoption. Grading is performed continuously during lectures and/or during exam, in compliance with the provisions of Regulation on the assessment of students.  |   |                 |  |                     |   |

**Continuous check-up:**

| Outcomes           | Written test | Home assignment | Threshold | Max   |
|--------------------|--------------|-----------------|-----------|-------|
| Outcome 1          | 20%          |                 | 10%       | 20%   |
| Outcome 2          |              | 10%             | 5%        | 10%   |
| Outcome 3          | 25%          |                 | 12,5%     | 25%   |
| Outcome 4          | 25%          |                 | 12,5%     | 25%   |
| Outcome 5          | 20%          |                 | 10%       | 20%   |
| Percentage of ECTS | 5,4          | 0,6             | -         | -     |
| Total              | 90%          | 10%             | 50 %      | 100 % |

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

**Exam term:**

| Outcomes           | Written exam | Oral exam | Max   |
|--------------------|--------------|-----------|-------|
| Outcome 1          | 20%          |           | 20%   |
| Outcome 2          |              | 10%       | 10%   |
| Outcome 3          | 25%          |           | 25%   |
| Outcome 4          | 25%          |           | 25%   |
| Outcome 5          | 20%          |           | 20%   |
| Percentage of ECTS | 5,4          | 0,6       | -     |
| Total              | 90%          | 10%       | 100 % |

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

**Grading:**

A student has passed the exam if he has acquired at least 50% of anticipated credits of a specific learning outcome.

If a student has passed learning outcomes of all courses, the accomplished credits (percentages) of all passed learning outcomes are being added, while the final grade is defined upon following table:

| Range of credits (percentages) | Numerical grade  | ECTS grade |
|--------------------------------|------------------|------------|
| 90,00 – 100,00                 | Excellent (5)    | A          |
| 75,00 – 89,99                  | Very good (4)    | B          |
| 60,00 – 74,99                  | Good (3)         | C          |
| 50,00 – 59,99                  | Sufficient (2)   | D          |
| 0,00 – 49,99                   | Insufficient (1) | F          |

**Obligatory literature**

1. OPERACIJSKI SUSTAVI, Prof. dr. sc. Leo Budin, FER, Zavod za elektroniku, mikroelektroniku, računalne i inteligentne sustave, Element, Zagreb 2011.

**Additional literature**

1. OPERATING SYSTEM CONCEPTS, Silberschatz, Galvine, Gagne, Sixth Edition, John Wiley & Sons, Inc. 2003.; MODERN OPERATING SYSTEMS,
2. Andrew S. Tanenbaum, Second Edition, Prentice Hall, Inc, 2001.; OPERATING SYSTEMS - Design and Implementation, Andrew S. Tanenbaum, Albert S. Woodhull, Second Edition Prentice Hall, Inc.



