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| <b>1. Subject name</b>   | <b>Digital Image Processing</b>                              |                                 |                     |                         |            |
| <b>2. Subject name in Hungarian</b>  | Képfeldolgozás   |                                 |                     |                         |            |
| <b>3. Code</b>   | <b>BMEKOALD002</b>   | <b>4. Evaluation type</b>       | <b>exam grade</b>   | <b>5. Credits</b>       | <b>4</b>   |
| <b>6. Weekly contact hours</b>   | <b>2 (0) Lecture</b>   | <b>2 (0) Practice</b>           | <b>0 (0) Lab</b>    |                         |            |
| <b>7. Curriculum</b>   | <b>PhD Programme</b>   | <b>8. Role</b>                  | <b>Basic course</b> |                         |            |
| <b>9. Working hours for fulfilling the requirements of the subject</b>   |  |                                 |                     |                         | <b>120</b> |
| <b>Contact hours</b>   | 56   | <b>Preparation for seminars</b> | 12                  | <b>Homework</b>         | 15         |
| <b>Reading written materials</b>   | 5  | <b>Midterm preparation</b>      | 12                  | <b>Exam preparation</b> | 20         |
| <b>10. Department</b>  | <b>Department of Material Handling and Logistics Systems</b> |                                 |                     |                         |            |
| <b>11. Responsible lecturer</b>  | Dr. Szirányi Tamás   |                                 |                     |                         |            |
| <b>12. Lecturers</b>   | Dr. Szirányi Tamás, Rózsa Zoltán                             |                                 |                     |                         |            |
| <b>13. Prerequisites</b>   |  |                                 |                     |                         |            |
| <b>14. Description of lectures</b>   |  |                                 |                     |                         |            |
| The aim of the course is to give students the opportunity to discover novel laws in one of the following topics: computer analysis, correction and processing of two- and three-dimensional images and videos; recognition and classification of figurative shapes; mathematical methods of image processing and evaluation, manipulation.   |  |                                 |                     |                         |            |
| <b>15. Description of practices</b>  |  |                                 |                     |                         |            |
| During the computer practice the students are programming and solving examples about the topic of the <a href="#">lectures</a> .   |  |                                 |                     |                         |            |
| <b>16. Description of laboratory practices</b>   |  |                                 |                     |                         |            |
| <b>17. Learning outcomes</b>   |  |                                 |                     |                         |            |
| A. Knowledge   |  |                                 |                     |                         |            |
| <ul style="list-style-type: none"> <li>• Knowing the processes and basic elements of image processing, enhancement and manipulation.</li> <li>• Having comprehensive knowledge about the different topics of image acquisition.</li> <li>• Knowing the computer description of images and basic properties.</li> <li>• Knowing the basics of shape recognition.</li> <li>• Knowing the basic properties of human vision.</li> <li>• Knowing the principles of decision making.</li> <li>• Having comprehensive about convolution and application areas.</li> <li>• Knowing the methods of motion-analysis and tracking.</li> <li>• Knowing the basic methods of texture characterization.</li> </ul> |  |                                 |                     |                         |            |
| B. Skills  |  |                                 |                     |                         |            |
| <ul style="list-style-type: none"> <li>• Being able to apply the knowledge in tasks related to image processing, enhancement and manipulation.</li> <li>• Application of decision making methods.</li> <li>• Being able to apply of different shape recognition algorithms.</li> <li>• Being able to solve tracking and motion analysis problems.</li> <li>• Being able to solve the problems alone or in group and efficiently transfer the knowledge.</li> <li>• Having original/innovative ideas.</li> </ul>  |  |                                 |                     |                         |            |
| C. Attitudes Working efficiently alone and in group. Seeking for relations to other subjects. Being open to use mathematical and informatic tools. Seeking to know and learn the necessary tools.  |  |                                 |                     |                         |            |
| D. Autonomy and Responsibility   |  |                                 |                     |                         |            |
| <ul style="list-style-type: none"> <li>• Seeking to solve the problems accurately and error-free.</li> <li>• Finding solutions alone.</li> <li>• Taking into considerations the effects of the decisions.</li> <li>• Applying systematic approach.</li> </ul>  |  |                                 |                     |                         |            |
| <b>18. Requirements, way to determine a grade (obtain a signature)</b>   |  |                                 |                     |                         |            |
| The evaluation of the learning results is based on the written ( <a href="#">homework</a> ) and oral (oral exam) performance.  |  |                                 |                     |                         |            |

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### 19. Opportunity for repeat/retake and delayed completion

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The [homework](#) can be corrected until the end of the week of examinations.

The oral exam can be re-take first free of charge. The second and higher re-take of the same subject has charge regulated by the university.

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### 20. Learning materials

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Online notes provided by the department; Bernd Jahne: Digital Image Processing, 5st edition, Springer, Heidelberg, 2002; W. K. Pratt: Digital Image Processing, Wiley, 2001.; Kató Zoltán, Czúni László: Számítógépes látás, Typotex, 2011

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| <b>Effective date</b> | 27 November 2019 | <b>This Subject Datasheet is valid for</b> | Inactive courses |
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