1. Course title: COMPUTER GRAPHICS
2. Course code: CG


4. Level of studies: first degree

5. Model of studies: stationary

6. Field of study: INFORMATICS

7. Profile of studies: general academic

8. Programme: COMPUTER GRAPHICS AND SOFTWARE

9. Semester: 4

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

11. Course instructor: Ph.D. Ewa Lach

12. Course classification: specialty subjects

13. Course status: obligatory

14. Language: english


16. Course objectives:
The course aims to provide the practical skills of the 3D computer graphics algorithms, and selected topics of 2D computer graphics. The project will enable students to get in touch with modern solutions in the field photo-realistic and interactive 3D graphics offered in world literature, create their own solutions to the projects as well as understanding fundamental conditions of modern computer animation.

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>Reference code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge of methods and tools used during the implementation of graphic applications.</td>
<td>Project</td>
<td>Project</td>
<td>K1A_W11, K1A_W13, K1A_W14, K1A_W22, K1A_U08, K1A_U12, K1A_U21, K1A_K02</td>
</tr>
<tr>
<td>2</td>
<td>Ability to apply basic raster graphics algorithms.</td>
<td>Project</td>
<td>Project</td>
<td>K1A_W11, K1A_W13, K1A_W14, K1A_W22, K1A_U08, K1A_U12, K1A_U21, K1A_K02</td>
</tr>
</tbody>
</table>

1 należy wskazać ok. 5 – 8 efektów kształcenia
<table>
<thead>
<tr>
<th></th>
<th>Ability to use different lighting models</th>
<th>Project</th>
<th>Project</th>
<th>K1A_W11, K1A_W13, K1A_W14, K1A_W22, K1A_U08, K1A_U12, K1A_U21, K1A_K02</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Ability to implement simple 3D transformations.</td>
<td>Project</td>
<td>Project</td>
<td>K1A_W11, K1A_W13, K1A_W14, K1A_W22, K1A_U08, K1A_U12, K1A_U21, K1A_K02</td>
</tr>
<tr>
<td>5</td>
<td>Ability to implement a simple computer animation.</td>
<td>Project</td>
<td>Project</td>
<td>K1A_W11, K1A_W13, K1A_W14, K1A_W22, K1A_U08, K1A_U12, K1A_U21, K1A_K02</td>
</tr>
</tbody>
</table>

18. Teaching modes and hours
Lecture / BA / MA Seminar / Class / Project / Laboratory:
0/0/0/0/30/0

19 Syllabus description:
The project presents practical knowledge concerning creation of simple graphical applications. In this way, students have the opportunity to test in practice the knowledge acquired during previous Computer Graphics courses. Presented issues implemented within the framework of projects, are following: raster algorithms, clipping and windowing, affine transformations and representation of objects, elimination of invisible surfaces, lighting models, raytracing, curves and parametric surfaces, computer animation, skeleton animation techniques, collision detection, particle effects, vertex and pixel programs.

20. Exam: no

21. Primary sources:

22. Secondary sources:
- A series of books: Graphics Gems
- Sumanta Guha: Computer Graphics Through OpenGL: From Theory to Experiments,
- Richard S. Wright Jr., Benjamin Lipchak: OpenGL. Księga eksperta. Helion
- OpenGL Programming Guide
- K. Dempski, DirectX. Rendering w czasie rzeczywistym, Helion.
### 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>-/-</td>
</tr>
<tr>
<td>2</td>
<td>Classes</td>
<td>-/-</td>
</tr>
<tr>
<td>3</td>
<td>Laboratory</td>
<td>-/-</td>
</tr>
<tr>
<td>4</td>
<td>Project</td>
<td>15/15</td>
</tr>
<tr>
<td>5</td>
<td>Seminar</td>
<td>-/-</td>
</tr>
<tr>
<td>6</td>
<td>Other</td>
<td>-/-</td>
</tr>
<tr>
<td></td>
<td>Total number of hours</td>
<td>15/15</td>
</tr>
</tbody>
</table>

### 24. Total hours: 30

### 25. Numbers of ECTS: 2

### 26. Number of ECTS credits allocated for contact hours: 1

### 27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2

### 26. Comments:

Approved:

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