Politechnika Świętokrzyska
WYDZIAŁ ELEKTROTECHNIKI, AUTOMATYKI I INFORMATYKI

COURSE DESCRIPTION

Course code	full-time studies	
	part-time-studies	
Course name	**Metody programowania grafiki komputerowej**	
Course name in English	**Methods of computer graphics programming**	
Valid from academic year	**2022/23**	

PLACEMENT IN THE TEACHING PROGRAM

Field of study	**Computer Science**
Level of education	**1st degree**
Studies profile	**General**
Form and method of teaching classes	**Full-time and part-time studies**
Specialization	**Information systems**
Organizational unit responsible for the course	**Department of Computer Systems**
Course coordinator	**Grzegorz Łukawski**
Approved by	**Dean of the Faculty of Electrical Engineering, Automatic Control and Computer Science Roman Deniziak, KUT prof., DSc, PhD**

GENERAL CHARACTERISTIC OF THE COURSE

Course affiliation		**Speciality course**
Course status		**Selectable**
Language		**English**
Semester	full-time studies	**7th**
	part-time-studies	**8th**
Requirements		**Basics of the computer graphics 1 & 2**
Exam (YES/NO)		**NO**
ECTS		**6**

Course form		lecture	classes	laboratory	project	other
Hours per semester	full-time studies	**30**		**15**	**30**	
	part-time-studies	**18**		**9**	**18**	

LEARNING RESULTS

Category	Result Symbol	Learning Results	References to the field of study results
Knowledge	W01	Student knows and understands the basics of 3D graphics programming using proper interfaces.	INF_W13
Knowledge	W02	Student knows and understands advantages of direct programming of the graphics processor. Knows and understands basics of a shader language.	INF_W13
Skills	U01	Student is able to program realistic 3D graphics with the help of a selected 3D interface.	INF_U13
Skills	U02	Student is able to program a graphics processor with the help of the a shader language.	INF_U13
Social competence	K01	Student is ready to analyse a programming problem, divide it into elements and cooperate in a team during its implementation.	INF_K1 INF_K2

COURSE CONTENT

Course Form	Content
lecture	1. Basics of 3D graphics programming using a proper interface.
lecture	2. Basics of graphics processor programming with a shader language.
lecture	3. Implementation of special effects in 3D graphics.
laboratory	Basics of graphics processor programming with a shader language.
project	Preparation of an application that realizes 3D graphics rendering with the help of specific tools, libraries and interfaces.

LEARNING RESULTS VERIFICATION METHODS

Result Symbol	Learning results verification methods					
	Oral Exam	Written Exam	Midterm	Project	Report	Other
W01			X			
W02			X			
U01			X			X
U02			X			X
K01				X	X	

ASSESSMENT FORMS AND CRITERIA

Course Form	Assessment Form	Assessment Criteria
lecture	Passing grade	The student should obtain at least 50% of points at the final test.
laboratory	Passing grade	The student should obtain at least 50% of points from laboratory classes and the final test, midterms or the final test and midterms.
project	Passing grade	The student should obtain at least 50% of points for the project task and report.

STUDENT'S VOLUME OF WORK

<table>
<tr><td colspan="13" align="center">ECTS Balance</td></tr>
<tr><td rowspan="3">No.</td><td rowspan="3">Activity Type</td><td colspan="10" align="center">Student Involvement</td><td rowspan="3">Unit</td></tr>
<tr><td colspan="5" align="center">full-time studies</td><td colspan="5" align="center">part-time-studies</td></tr>
<tr><td>Lec</td><td>C</td><td>Lab</td><td>P</td><td>S</td><td>Lec</td><td>C</td><td>Lab</td><td>P</td><td>S</td></tr>
<tr><td>1.</td><td>Participation in classes according to the schedule</td><td>30</td><td></td><td>15</td><td>30</td><td></td><td>18</td><td></td><td>9</td><td>18</td><td></td><td>h</td></tr>
<tr><td>2.</td><td>Other (consultations, exams)</td><td>2</td><td></td><td>2</td><td>2</td><td></td><td>2</td><td></td><td>2</td><td>2</td><td></td><td>h</td></tr>
<tr><td>3.</td><td>Total with the direct assist of an academic teacher</td><td colspan="5" align="center">81</td><td colspan="5" align="center">51</td><td>h</td></tr>
<tr><td>4.</td><td>Number of ECTS, that students obtains with the direct assist of an academic teacher</td><td colspan="5" align="center">3,24</td><td colspan="5" align="center">2,04</td><td>ECTS</td></tr>
<tr><td>5.</td><td>Hours of unassisted student work</td><td colspan="5" align="center">69</td><td colspan="5" align="center">99</td><td>h</td></tr>
<tr><td>6.</td><td>Number of ECTS that student obtains working unassisted</td><td colspan="5" align="center">2,76</td><td colspan="5" align="center">3,96</td><td>ECTS</td></tr>
<tr><td>7.</td><td>Practical classes volume of work</td><td colspan="5" align="center">45</td><td colspan="5" align="center">27</td><td>h</td></tr>
<tr><td>8.</td><td>Number of ECTS obtained by student at practical classes</td><td colspan="5" align="center">1,8</td><td colspan="5" align="center">1,08</td><td>ECTS</td></tr>
<tr><td>9.</td><td>Total student's volume of work expressed in hours</td><td colspan="5" align="center">150</td><td colspan="5" align="center">150</td><td>h</td></tr>
<tr><td>10.</td><td>ECTS</td><td colspan="10" align="center">6</td><td>ECTS</td></tr>
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BIBLIOGRAPHY

1. Foley, James D.; van Dam, Andries; Feiner, Steven K.; Hughes, John: "Computer Graphics: Principles and Practice in C (2nd ed.)". Addison-Wesley 1995
2. Pavlidis, Theo: "Algorithms for Graphics and Image Processing", Berlin-Heidelberg-New York, Springer-Verlag 1982.
3. Randi J. Rost: "OpenGL Shading Language (3rd Edition)", Addison-Wesley Professional, 2009.
4. John Kessenich, Graham Sellers, Dave Shreiner: "OpenGL Programming Guide: The Official Guide to Learning OpenGL, 9th Edition", 2016.