


**KAPITAŁ LUDZKI**  
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez  
 Unię Europejską w ramach  
 Europejskiego Funduszu  
 Społecznego

**UNIA EUROPEJSKA**  
 EUROPEJSKI  
 FUNDUSZ SPOŁECZNY


<b>Course title</b>		<b>ECTS code</b>	
3D Graphics 2		11.3.1745	
<b>Name of unit administrating study</b>			
Faculty of Mathematics, Physics and Informatics			
<b>Studies</b>			
<b>faculty</b>	<b>field of study</b>	<b>type</b>	second tier studies (MA)
Faculty of Mathematics, Physics and Informatics	Informatics	<b>form</b>	full-time
		<b>specialty</b>	all
		<b>specialization</b>	all
<b>Teaching staff</b>			
prof. UG, dr hab. Piotr Arłukowicz			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>	
<b>Forms of classes</b>		7	
Laboratory classes, Lecture			
<b>The realization of activities</b>			
classroom instruction, online classes			
<b>Number of hours</b>			
Lecture: 30 hours, Laboratory classes: 30 hours			
<b>The academic cycle</b>			
2021/2022 summer semester			
<b>Type of course</b>		<b>Language of instruction</b>	
an elective course		- english in 5.00% - polish in 95.00%	
<b>Teaching methods</b>		<b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>	
- Making independent materials for further work - e.g. photos, videos, etc.  Analyzing and acquiring network resources for the purpose of the subject. - a reverse lecture method - conducting experiments - critical incident (case) analysis - designing experiments - multimedia-based lecture - problem solving		<b>Final evaluation</b> - Graded credit - Examination  <b>Assessment methods</b> - assignment work – project or presentation - assignment work – completing a specific practical assignment - graded course credit based on individual grades obtained during the semester - written exam (test) - oral exam - A rather unusual, although possible way to pass the exam is to bring your artwork and present it. Depending on the interview and the level of understanding of the topic and the quality of the work, a final grade may be issued.	
		<b>The basic criteria for evaluation</b>	
		1. Quality, wow-factor and advancement of a dedicated graphic design. 2. Techniques used to implement the project.	
<b>Method of verifying required learning outcomes</b>			
<b>Required courses and introductory requirements</b>			
<b>A. Formal requirements</b>			
There are no formal requirements for the preceding items for this course.			

<b>B. Prerequisites</b> Computer skills, file transfer, searching for information on the Internet, it is advisable to use 2D graphics programs.	
<b>Aims of education</b> The aim of education is to familiarize students with the methods of creating three-dimensional graphics, and later with animation and simulation.	
<b>Course contents</b> <ol style="list-style-type: none"> <li>1. Introduction, familiarization, organizational matters, in the second part: the basics of using Blender, and a lot of useful information on how to start and how to understand the rules of working in the program.</li> <li>2. GRS transformations, snapping, aligning, objects management, some general matters</li> <li>3. Modifiers (selected!): Subsurf, Bevel, Solidify, Simpledeform, Boolean, Mirror and others</li> <li>4. Editing operators for objects: split, join, extrude, fill, etc.</li> <li>5. Editing curves: NURBS, Path, Bezier, text objects</li> <li>6. Stage lighting: light types, ambient, environment, indirect light, models of light: 2-point and 3-point studio, etc.</li> <li>7. Simple materials: BSDF diffuse and specular shaders, mirror + transparency</li> <li>8. Materials: procedural and bitmap textures, HDR techniques</li> <li>9. Materials: advanced effects: shadowing, stencil map, bumpmap, reflection map, etc.</li> <li>10. Mapping in UV space: mapping spaces + skinning, unwrapping</li> <li>11. Advanced UV mapping: projection painting</li> <li>12. Baking: normal mapping, shadow burn-in, texture compositing</li> <li>13. Node editor: scene postprocessing and special effects</li> <li>14. Special Effects: dupliframes, dupliframes, clay, edge rendering, other renderers</li> <li>15. Reserved for additional content</li> </ol>	
<b>Bibliography of literature</b> No up-to-date literature on the topic. I recommend online courses that are up-to-date (the field changes so quickly that any book you buy from a bookstore is outdated at least a year). Recommended sites: <ol style="list-style-type: none"> <li>1. <a href="http://polskikursblendera.pl">http://polskikursblendera.pl</a></li> <li>2. <a href="http://cgcookie.com">http://cgcookie.com</a></li> <li>3. <a href="http://blenderguru.com">http://blenderguru.com</a></li> <li>4. <a href="http://vimeo.com/groups/piotao">http://vimeo.com/groups/piotao</a></li> </ol> In addition, it is worth downloading materials from Open Projects such as Elephants Dream, The Big Buck Bunny, Sintel or others - these are Open Source productions made in Blender. All materials are available free of charge. In order to read about general graphics and graphics technologies, you can read the following books: <ol style="list-style-type: none"> <li>1. Introduction to Computer Graphics: A Practical Learning Approach (Chapman &amp; Hall/CRC Computer Graphics, Geometric Modeling, and Animation), ISBN-13: 978-1439852798</li> <li>2. Learning Blender: A Hands-On Guide to Creating 3D Animated Characters 2nd Edition, ISBN-13: 978-0134663463</li> <li>3. The Complete Guide to Blender Graphics: Computer Modeling &amp; Animation 6th Edition, ISBN-13: 978-0367536190</li> <li>4. Modeling and Animation Using Blender: Blender 2.80: The Rise of Eevee 1st ed. Edition, ISBN-13: 978-1484253397</li> <li>5. The Illusion of Life: Disney Animation, ISBN-10 : 0786860707</li> <li>6. Blender Quick Start Guide: 3D Modeling, Animation, and Render with Eevee in Blender 2.8, ISBN-13 : 978-1789619478</li> </ol>	
<b>The learning outcomes (for the field of study and specialization)</b>  As a result, the student will be able to create various types of 3D graphics in which, among others, physically mapped light reflections and properties of various physical surfaces will be used.	<b>Knowledge</b>  K_W01: the student is able to create and implement his own artistic concepts and have the skills needed to express them K_W03: has in-depth knowledge of programming paradigms and advanced programming structures; knows the current trends in programming languages K_W06: knows well the rules of occupational health and safety in the IT profession P_W01: the student knows what is the animation based on the keyframe system P_W02: the student understands the rules of interpolation of motion curves and their impact on animation, its pace and dynamics P_W03: the student knows the concepts of 'shapekeys', 'drivers', 'ease-in / out', 'rig', 'armature', 'pose-mode', 'bvh', and many others. P_W04: the student understands the so-called 12 rules of animation developed by the Disney studio P_W05: the student knows what is the difference between the overtaking kinematics and the inverse one in bone-based rigs.
	<b>Skills</b>  K_U03: designs, analyzes in terms of correctness and computational complexity, and builds algorithms using advanced programming techniques and data structures K_U08: can obtain information from professional literature, databases, the Internet and other sources, integrate them, evaluate their credibility, make interpretations

and draw conclusions and formulate opinions

K\_U10: can determine the directions of further learning and implement the process of self-education

P\_U01: the student is able to model the structure of a simple object from his surroundings, such as a monitor, keyboard, chair or table.

P\_U02: the student is able to illuminate a 3D scene in accordance with the rules used in photo studios

P\_U03: the student correctly selects the shaders used to map a specific type of surface

P\_U04: the student designs materials that use the advanced properties of the Cycles rendering engine

#### **Social competence**

K\_K01: knows the limitations of his own knowledge and understands the need for further learning

K\_K03: can and is ready to formulate opinions on basic IT issues

P\_K01: the student is sensitive to the visual harmony and arrangement of elements

P\_K02: student exhibits creativity in the creative process and openness to criticism and assessment of other

P\_K03: the student practices the pursuit of honesty, responsibility and honesty in creative areas

#### **Contact**

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