Uniwersytet Gdański

KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego

UNIA EUROPEJSKA
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FUNDUSZ SPOŁECZNY

Course title	ECTS code
3D Graphics	11.3.1567

Name of unit administrating study

Faculty of Mathematics, Physics and Informatics

Studies

faculty	field of study	type	second tier studies (MA)
Faculty of Mathematics, Physics and Informatics	Informatics	form	full-time
		specialty	all
		specialization	all

Teaching staff

prof. UG, dr hab. Piotr Arłukowicz

Forms of classes, the realization and number of hours	ECTS credits
Forms of classes	7
Lecture, Workshops	
The realization of activities	
classroom instruction, online classes	
Number of hours	
Lecture: 30 hours, Workshops: 30 hours	

The academic cycle

2021/2022 summer semester

Type of course	Language of instruction
an elective course	- polish in 95.00%
	- english in 5.00%

Teaching methods	Form and method of assessment and basic criteria for eveluation or examination requirements

Teaching methods

- 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

Form and method of assessment and basic criteria for eveluation or examination requirements

Final evaluation

- Graded credit
- Examination

Assessment methods

- 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.

The basic criteria for evaluation

1. Quality, wow-factor and advancement of a dedicated graphic design.
2. Techniques used to implement the project.

Method of verifying required learning outcomes

Required courses and introductory requirements

A. Formal requirements

There are no formal requirements for the preceding items for this course.

B. Prerequisites

Computer skills, file transfer, searching for information on the Internet, it is advisable to use 2D graphics programs.

Aims of education

The aim of education is to familiarize students with the methods of creating three-dimensional graphics, and later with animation and simulation.

Course contents

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.
2. GRS transformations, snapping, aligning, objects management, some general matters
3. Modifiers (selected!): Subsurf, Bevel, Solidify, Simpledeform, Boolean, Mirror and others
4. Editing operators for objects: split, join, extrude, fill, etc.
5. Editing curves: NURBS, Path, Bezier, text objects
6. Stage lighting: light types, ambient, environment, indirect light, models of light: 2-point and 3-point studio, etc.
7. Simple materials: BSDF diffuse and specular shaders, mirror + transparency
8. Materials: procedural and bitmap textures, HDR techniques
9. Materials: advanced effects: shadowing, stencil map, bumpmap, reflection map, etc.
10. Mapping in UV space: mapping spaces + skinning, unwrapping
11. Advanced UV mapping: projection painting
12. Baking: normal mapping, shadow burn-in, texture composing
13. Node editor: scene postprocessing and special effects
14. Special Effects: dupliverts, dupliframes, clay, edge rendering, other renderers
15. Reserved for additional content

Bibliography of literature

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:

1. http://polskikursblendera.pl
2. http://cgcookie.com
3. http://blenderguru.com
4. http://vimeo.com/groups/piotao

In addition, it is worth downloading materials from Open Projects such as Elphants 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:

1. Introduction to Computer Graphics: A Practical Learning Approach (Chapman & Hall/CRC Computer Graphics, Geometric Modeling, and Animation), ISBN-13: 978-1439852798
2. Learning Blender: A Hands-On Guide to Creating 3D Animated Characters 2nd Edition, ISBN-13: 978-0134663463
3. The Complete Guide to Blender Graphics: Computer Modeling & Animation 6th Edition, ISBN-13: 978-0367536190
4. Modeling and Animation Using Blender: Blender 2.80: The Rise of Eevee 1st ed. Edition, ISBN-13: 978-1484253397
5. The Illusion of Life: Disney Animation, ISBN-10 : 0786860707
6. Blender Quick Start Guide: 3D Modeling, Animation, and Render with Eevee in Blender 2.8, ISBN-13 : 978-1789619478

The learning outcomes (for the field of study and specialization)	Knowledge
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.	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.
	Skills
	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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