Course Syllabus

Course from study programme for the cycle: 2022/2023

I. General Information

Course name	Methods and algorithms for computer graphics
Programme	Informatics
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	BA
Form of studies (full-time, part-time)	full-time
Discipline	Informatics
Language of instruction	english

Course coordinator	dr Armen Grigoryan

Type of class *(use only the types mentioned below)*	Number of teaching hours	Semester	ECTS Points
lecture	30	IV	5
tutorial			
classes			
laboratory classes	30	IV	
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	Fundamentals of algorithms and programming Computer graphics Mathematical basics for computer graphics

II. Course Objectives

Presentation of the basic algorithms used in applied in computer graphics.
Presentation of advanced techniques used in three-dimensional computer graphics.

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	The student knows basic algorithms of computer graphics.	K_W11
W_02	The student knows advanced techniques of three-dimensional computer graphics	K_W11
SKILLS		
U_01	Ability to analyse basic computer graphics algorithms.	K_U02, K_U04, K_U25
U_02	Application of three-dimensional computer graphics basic methods.	K_U02, K_U04, K_U25
SOCIAL COMPETENCIES		
K_01	The student is aware of his knowledge and skills and understands the need for lifelong learning.	K_K01

IV. Course Content

Raster algorithms. De Casteljau algorithm. Introduction to OpenGL: compatibility and core profiles. Rendering methods. Modifiers and their applications. Particle systems. Texturing (also procedural texturing). Applications of physical models in computer graphics.

V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods *(choose from the list)*	Forms of assessment *(choose from the list)*	Documentation type *(choose from the list)*
KNOWLEDGE			
W_01	Conventional lecture	Test	Protocol
W_02	Conventional lecture	Test	Protocol
SKILLS			
U_01	Laboratory classes design thinking	Test	Protocol
U_02	Laboratory classes design thinking	Test	Protocol
SOCIAL COMPETENCIES			
K_01	Laboratory classes design thinking	Test	Protocol

VI. Grading criteria, weighting factors.....

Classes: graded pass based on a test result:
91 – 100% - 5,
81 – 90% - 4.5,
71 – 80% - 4.0,
61 – 70% - 3.5,
50 – 60% - 3.0,
0 - 49% -2.0

Lecture: graded pass based on a test result (only for those who have completed the classes):
91 – 100% - 5,
81 – 90% - 4.5,
71 – 80% - 4.0,
61 – 70% - 3.5,
50 – 60% - 3.0,
0 - 49% -2.0

Detailed assessment rules are given to students with each subject edition.

VII. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	Lecture 30 Laboratory 30 Consultations 30
Number of hours of individual student work	60

VIII. Literature

Basic literature
1. Foley, J., Van Dam, A., et al, “Computer graphics : principles and practice”, Addison-Wesley; 2014. 2. OpenGL Architecture Rewiew Board: M. Woo, J. Neider, T. Davis, "OpenGL Programming Guide", Second Edition, Addison-Wesley Developer Press, Sydney, Bonn, Amsterdam, Tokyo, 1997. 3. Simonds, B., “Blender master class; a hands-on guide to modeling, sculpting, materials, and rendering”, Portland: Ringgold, Inc, 2013. 4. opengl.org 5. blender.org
Additional literature
1. Flavell, L., ”Beginning Blender Open Source 3D Modeling, Animation, and Game Design”, Berkeley, CA : Apress : Imprint: Apres, 2012. 2. Agoston, M. K., ”Computer Graphics and Geometric Modelling Implementation & Algorithms”, London : Springer London : Imprint: Springer; 2005.