Subject code	Credits
INF2008	6

Course title in Lithuanian

GRAFIKA IR VIZUALIZAVIMAS

Course title in English

GRAPHICS AND VISUALIZATION

Short course annotation in Lithuanian (up to 500 characters)

Dalykas skirtas supažindinti su programavimo įrankiais informacijos vizualizavimui. Kurso metu studentai sužinos apie įvairius 2D ir 3D objektų kūrimo bei valdymo, tikroviškumo sukūrimo, vaizdo kokybės gerinimo metodus ir priemones. Išklausius kursą studentai įgis kompiuterinės grafikos pagrindus reikalingus norint panaudoti šiuolaikinius 3D grafikos programavimo įrankius ir kuriant 2D ir 3D grafikos programas, susipažins su WebGL grafine biblioteka ir išmoks savarankiškai programuoti grafinius vaizdavimo uždavinius.

Short course annotation in English (up to 500 characters)

This course introduces students to computer programming tools for the visualization of information. The course covers various computer graphics techniques and algorithms used to form and manipulate 2D and 3D objects, create visual realism, enhance video quality. During the course students will learn fundamental algorithms and techniques and gain the knowledge necessary to understand and augment the latest innovations in computer graphics. WebGL graphics library is used through laboratory exercises to provide the students opportunity to gain practical experience in programming graphical applications.

Prerequisites for entering the course

Programming fundamentals

Course aim

Provide knowledge on fundamentals of 2D and 3D computer graphics and data visualization.

Content

No	Content (topics)
1.	Introduction to tools and api's for programming graphical applications.
2.	Graphics and visualization practical examples.
3	Creating virtual scene and graphical objects.
4.	Displaying virtual scene on computer screen.
5.	Modelling transformations.
6.	Colours. Colour models, spaces and profiles.
7.	Modelling the light. Light sources in computer graphics.
8.	Shading and illumination models.
9.	Curves and surfaces.
10.	Texture mapping techniques.

Distribution of workload for students (contact and independent work hours)

Lectures	**45 hours**
Laboratory work	**30 hours**
Individual students work	**85 hours**
Total:	**160 hours**

Structure of cumulative score and value of its constituent parts

Final written exam (30%), mid-term written exam (20%), and assessments of laboratory (practical) work (50%).

Recommended reference materials

No.	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	*Self-study rooms*	*Other libraries*
Basic materials						
1.	2003	R. Liutkevičius. Kompiuterinė grafika.	Vytautas Magnus University	10	unlimited, electronic book	1
2.	2012/ 2004	E. Lengyel. Mathematics for 3D game programming and computer graphics. 2/3ed.	Charles River Media	unlimited online content, through EBSCOhost	unlimited, electronic book	1

3.	2009	L. Benstead. Beginning OpenGL game programming.	Course Technology	unlimited online content, through EBSCOhost	unlimited, electronic book	
4.	2008	J. Dorsey, H. Rushmeier, F. Sillion. Digital modeling of material appearance.	Morgan Kaufman	unlimited online content, through EBSCOhost	unlimited, electronic book	
5.	2000	A. Watt. 3D Computer Graphics.	Pearson Education.			1
Supplementary materials						
1.	2012	T. Parisi. WebGL: Up and Running. Building 3D Graphics for the Web.	O'Reilly			

Course programme designed by

Dr. Andrius Davidsonas