

COURSE TITLE: **COMPUTER GRAPHICS**

Institute/Division: Chair of Technical Informatics
Faculty of Electrical and Computer Engineering

Course code: EcGraph

Erasmus subject code: 061 , (old)11.3

Number of contact hours: 45

Course duration: 1 semester (winter)

ECTS credits: 6

Course description: The course comprises lectures, laboratory exercises and individual project. It is designed to provide the student with knowledge of the basic concepts of computer graphics algorithms used to image generation and processing as well as data compression. The part of the lecture concerns the advantages and disadvantages of vector graphics, means of its representation, and examples of practical application. Raster graphics related to the graphics memory problems will be presented with their details. Several examples of how graphic was represented in the '80s and '90s will be shown and described, this includes the simulation of real images on different computer systems.

The topics of the lectures include:

Basic concepts of raster and vector graphics. Simulations of different computer systems from the '80s and '90s. Algorithms for line, circle and ellipse rasterization. Algorithms for filling the area. Transformations, visualization and anti-aliasing. Physical and physiological aspects of human perception of images. Basic information about color and color models. Simple algorithms of lossless compression: ByteRun, RLE, LZW, Huffman, LZ77, Golomb and Rice code.

Laboratory exercises and individual project are aimed to supply additional practical knowledge in the area of computer graphics and data compression.

Course type: Lectures (20h), computer laboratory (20h) and project (5h)

Literature: A. P. Godse: *Computer Graphics*, Technical Publications, 2009.
J.Gomes, L.Velho, *Image Processing for Computer Graphics*, Springer-Verlag, 1997
M. J. Laszlo: *Computational Geometry and Computer Graphics in C++*, Prentice-Hall, 2009.
A. Drozdek: *Data Structures and Algorithms in C++*, Brooks/Cole Pub Co, 2000.
S. Sahni: *Data Structures, Algorithms, and Applications in Java*, McGraw Hill College Div, 2001.

Assessment method: Project and laboratory exercises.

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