POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Computer graphics [S1IBio1>GK]

Course

Field of study
Biomedical Engineering

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other
15	15	0

Tutorials	Projects/seminars	
0	0	

Number of credit points

2,00

Coordinators

mgr inż. Arkadiusz Kroma
arkadiusz.kroma@put.poznan.pl

Lecturers

Prerequisites

A student starting this course should have basic knowledge of the computer science. Student should also be able to use the information obtained from the library and the Internet and be able to think logically. The learner understands the needs of learning and acquiring new knowledge.

Course objective

Learning the methods of image analysis and it's processing.

Course-related learning outcomes

Knowledge:
1. Knows the basic methods of techniques and tools in the area of computer graphics.
2. Has knowledge of three-dimensional graphics.

Skills:
1. Can use the methods of image analysis and processing to carry out tasks in the field of biomedical engineering.
2. Can use information and communication techniques appropriate to the implementation of tasks

typical for engineering activities.

Social competences:
1. Understands the need for lifelong learning; can inspire and organize the learning process of other people.
2. Can interact and work in a group, assuming different roles in it.
3. Can set priorities for the implementation of a task set by himself or others.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:
Completion of the course based on a test at the end of the semester. Passing in case of obtaining min. 50.1% correct answers. Up to 50.0% - 2.0, from 50.1% to 60.0% - 3.0, from 60.1% to 70.0% - 3.5, from 70.1 to 80.0 - 4.0, from 80.1% up to 90.0% - 4.5, from 90.1% - 5.0.
Laboratory exercises:
Passing on the basis of an oral or written answer concerning the content of each laboratory exercise, a report on each laboratory exercise according to the instructions of the laboratory teacher.
In order to pass the laboratories, all exercises must be passed (positive grade from the answers and the report).

Programme content

Program covers the basic principles of computer graphics processing (preparation, acquisition, editing, verification), and topics related to the properties of vision, with particular emphasis on color perception.

Course topics

Vision. Properties of sight. Color perception.
Introduction to computer graphics (definitions and purpose of computer graphics and graphics, historical outline of the development of computer graphics, basic types of computer graphics, characteristics, properties, applications of various types of computer graphics).
Raster graphics (the essence of building and creating raster graphics, software for creating and editing raster graphics, manipulating the shape and text in raster graphics, basic transformations and tools for transforming graphics, color attributes, color models in graphics, models and compression methods used in raster graphics, raster graphics file formats and their properties, usage of layers, paths and selections to create and process raster graphics).
Devices for the acquisition of real images (digital cameras, scanners) and data communication devices (including TV's, CRT/LCD screens, plasma, video projector), laser, inkjet printer, plotter, platesetter, photolab).
Digital image analysis methods.
Computer animation (essence, properties, application of animation, review of computer animation software, creating animation objects, preparing graphic and text objects for animation, idea and principles of creating animation, selection and setting of animation parameters).

Teaching methods

1. Lecture: multimedia presentation illustrated with examples given on the board.
2. Laboratory exercises: instruction for exercises, multimedia presentation and carrying out the tasks indicated by the teacher on computers - practical exercises.
3. Consultation: Individual work with the student in order to explain the problematic issues of the topics discussed during the classes.

Bibliography

Basic:
1. Foley J.D., An Introduction to Computer Graphics. WNT, Warsaw 2001
2. W. Pastuszak: Color in computer graphics, Wydawnictwo Naukowe PWN, Warsaw 2000
3. Fedak J., Digital photography from A to Z. Encyklopedia. MUZA SA, Warsaw 2006

Additional:

1. K. Skarbek: Multimedia - Compression algorithms and standards, Akademicka Oficyna Wydawnicza, Warsaw1998

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00

1. K. Skarbek: Multimedia - Compression algorithms and standards, Akademicka Oficyna Wydawnicza, Warsaw1998

Breakdown of average student's workload