**CO2016 Multimedia and Computer Graphics**

**Credits:** 10  
**Convenor:** Dr. M. Hoffmann  
**Semester:** 2nd

**Prerequisites:** Essential: CO1003, CO1005

**Assessment:**  
Coursework: 50%  
Two hour exam in May/June: 50%

**Lectures:** 15 hours  
**Laboratories:** 15 hours  
**Private Study:** 45 hours

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**Subject Knowledge**

**Aims**  
This module teaches the principles and technical details of multimedia data and 3D-environments.

**Learning Outcomes**  
Students should be able to demonstrate understanding of: the basic representation and handling of multimedia data (sound, pictures and animation), the basic components of a 3D-environments.

**Methods**  
Class sessions together with course notes, recommended textbook, worksheets, and some additional hand-outs and web support.

**Assessment**  
Marked coursework, written examination.

**Skills**

**Aims**  
Produce animation. Create a 3D representation

**Learning Outcomes**  
Students will be able to: reason about different multimedia formats, write short animation; write Java 3D components and reason about their behavior; create dynamic 3D environment.

**Methods**  
Class sessions together with worksheets.

**Assessment**  
Marked coursework, written examination.

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**Explanation of Prerequisites**  
It is essential that students have a good working knowledge of Java, up to and including the use of abstract classes and exceptions. No specific knowledge about multimedia data is required. It is beneficial if students taking this module have a very rudimentary understanding of a 3 dimensional space.

**Course Description**  
The area of multimedia includes a wide variety of data. In this module we will deal with pictures, animation, audio and 3D landscapes. Images are built out of pixels. Each pixel has a certain color or grey tone. Handling Images on the level will allow us to analyse and manipulate images. On the practical side we will program these effects in Java, but also understand what information, if any, is lost by certain effects. Bringing images to life, e.g. placing an animation, we will use the recent established Internet standard SVG. Images in SVG are described using XML documents. This allows scalability and animation. SVG has similar features to FLASH. Completing the introduction to multimedia data we draw our attention to audio data. The understanding of how to digitalize sound and how to deal with sound in the digitalized format (e.g. placing sound effects) and its practical implementation will be the focus here. In the last part of this module we will create virtual landscapes using Java 3D. Apart from the basic concepts these landscapes contain different forms of lighting and lighting effects, moving objects and objects with different behaviors (e.g. collision behaviors) The main computer language for this module is Java including Java3D.

**Detailed Syllabus**

1. Image analysis
2. Image resizing and dithering
3. Audio data handling

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4. Basic SVG concepts
5. Scene graphs in Java3D
6. Textures, lighting in Java3D
7. Rotation and movement of 3D objects
8. Behaviors of 3D objects

Reading List


Resources Course notes, departmental web page, study guide, worksheets, handouts, lecture rooms with projection facilities and OHPs, example examination papers.

Module Evaluation Course questionnaires, course review.