



COURSE SPECIFICATION			
NAME OF COURSE: Modeling and animation 1		COURSE CODE:	
STATUS: (main,optional, Free Choice) main	LEVEL: (F,A,P,1,2,3,M) M	UNIT VALUE: 7 ECTS	TERMS TAUGHT: 1 st term
Department offering course: Computer Science	Course Co-ordinator: Selma Rizvic Aida Sadzak	Date of course commencement: September 2008.	
Degree Programmes in which to be offered: Computer Graphics for the Media Industry			
Pre-requisites: Entry requirement	Indicate whether a new course or name of course being replaced: new	Total Contact Hours: 40 Lectures: 10 Tutorials: 10 Lab Sessions: 20	
AIMS OF THE COURSE: This course aims to develop skills in creating 3D models, rigging, illuminating the scene, creating materials and texturing, creating cameras and basic rendering. Students will learn advanced computer modeling skills using the Maya software system.			

INTENDED LEARNING OUTCOMES
1. Design and create detailed computer models, including character models, rig them using skeletons and calculate kinematics
2. Create and texture the materials
3. Illuminate the scene using lights
4. Create cameras
5. Understand the basic principles of scene visualisation - rendering using Maya default renderers



LEARNING AND TEACHING STRATEGIES TO BE USED:
1. lectures and tutorial on room design
2. lectures and tutorial on shaders and textures
3. lectures and tutorial on lighting effects
4. lectures and tutorial on camera position planning
5. lectures and tutorials on rendering and visualisation techniques



ASSESSMENT CRITERIA (SHOULD LINK EXPLICITLY TO INTENDED LEARNING OUTCOMES):
1. Lab. project 20%
2. Lab. project 20%
3. Lab. project 20%
4. Lab. project 20%
5. Lab. project 20%

TRANSFERABLE SKILLS AND OTHER ATTRIBUTES
1. 3D modeling
2. Understanding rigging and kinematics
3. Creating, illuminating and rendering 3D scenes



LEARNING AND TEACHING STRATEGIES USED:
1. Lectures and tutorials
2. Lectures and tutorials
3. Lectures and tutorials



ASSESSMENT CRITERIA (SHOULD LINK EXPLICITLY TO INTENDED LEARNING OUTCOMES):
1. lab. projects
2. lab. projects
3. lab. projects

COURSE OUTLINE/SYLLABUS:

- Basic modeling concepts – space, objects and structures; building with numbers; points, lines and surfaces; file formats for modeling
- Basic modeling techniques – geometric primitives, sweeping, free-form objects, basic modeling utilities, real-time polygonal models
- Advanced modeling techniques – free-form curved surfaces, subdivision surfaces, logical operators and trimmed surfaces, advanced modeling utilities, procedural descriptions and physical simulations, photogrammetry and image-based modeling
- Character modeling – representing body geometry, geometry data acquisition, geometry deformation, layered approach to human figure modeling
- Skeletons and kinematics - bone systems, forward and inverse kinematics, rigging
- Materials and texturing – surface shading techniques, surface shaders, image mapping, surface reflectivity, surface color, surface texture, surface transparency, environment dependent shading
- Scene illumination – lighting strategies and mood, types of light sources, basic components of a light, lighting the scene, basic positions of light sources
- Cameras –types of cameras, the pyramid of vision, types of camera lenses, camera animations
- Scene visualisation - basic rendering concepts: light, camera and materials; color; steps in rendering process; hidden surface removal; Z-buffer; ray tracing, global illumination and radiosity, image-based rendering; non-photorealistic rendering; hardware rendering; file formats for rendering

KEY TEXTS AND/OR OTHER LEARNING MATERIALS:

Isaac Victor Kerlow “The Art of 3-D Computer Animation and Effects”, Third Edition, John Wiley and Sons, 2004.

Rick Parent “Computer Animation”, Second Edition: Algorithms and Techniques, Morgan Kaufmann Publishers, 2001.