

MODULE DESCRIPTION

General

School	Geotechnical Sciences
Department	Forest and Natural Environment Sciences

Module Information

Title	Digital Design (3D)
Course Code	OPT.12
Level of Studies	Undergraduate
Teaching Period	Spring semester (6 th)
Attendance Type	Optional course
Prerequisites	None

Orientation	Weekly Hours		Year	Semester	ECTS
	Lectures	Laboratory work			
Landscape Architecture & Restoration	1	2	3 rd	6 th	3

Faculty Instructor

Athanasios D. STYLIADIS

Type of Module

- General Foundation
- Specific Foundation / Core
- Knowledge Deepening / Consolidation

Mode of Delivery

- Face to face
- Distance learning

Digital Module availability

- E-Study Guide
- Departments Website
- E-Learning

Language

	Teaching	Examination
Greek	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
English	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Erasmus

- The course is offered to exchange programme students

Learning Outcomes

- Familiarization of students with the basic theoretical principles of 3D Computer Graphics in a digital environment.
- Familiarization of students with the VRML language.
- Introduction to creative design and virtual worlds in natural environments.
- Development of graphic information - Algorithms (three dimensions).
- Geometric transformations of the graphic information (three dimensions).
- Virtual reality (VR) and augmented reality (AR) applications in Forest and Natural Environment sciences.

List of General Competences

- Apply knowledge in practice
- Work autonomously
- Work in teams
- Work in an international context
- Work in an interdisciplinary team
- Respect natural environment
- Advance free, creative and causative thinking

Module Content (Syllabus)

- Computer graphics algorithms in three dimensions (Vector vs. Raster transformation, Scan-conversion algorithms).
- Geometric and viewing transformations in three dimensions.
- Basic transformations in three dimensions.
- Lighting, immediate mode libraries (OpenGL, Direct3D, etc.), scene chart, retained mode libraries (Java3D, VRML / X3D), etc.
- VRML: introduction, syntax, implementations, basic tools, geometry, transformations, node reuse, external references.
- Materials, textures, colors, lighting, viewpoints, background, sound, text, billboards, HUDs, animation, video, scripting, computer graphics programming techniques.

Educational Material Types

- Book
- Notes
- Slide presentations
- Video lectures
- Multimedia
- Interactive exercises

Other:

Use of Information and Communication Technologies

- Use of ICT in Course Teaching
- Use of ICT in Laboratory Teaching
- Use of ICT in Communication with Students
- Use of ICT in Student Assessment

Module Organization

Please fill in the workload of each course activity

Course Activity	Workload (hours)
Lectures	10
Laboratory work	10
Field Trip/Short Individual Assignments	20
Independent Study	35
Total	75

* 1 ECTS unit corresponds to 25 hours of workload

Student Assessment Methods

- Written Exam with Multiple Choice Questions
- Written Exam with Short Answer Questions
- Written Exam with Extended Answer Questions
- Written Assignment
- Report
- Oral Exams
- Laboratory Assignment

Suggested Bibliography (Eudoxus and additional bibliography)

- Athanasios D. Styliadis, «Computer Graphics», Ziti Publications, Thessaloniki, ISBN: 960-431-510-2, Eudoxus code: 11193.
- Athanasios D. Styliadis, «Programming the User Interface in Human-Computer Interaction – A Computing GIS Perspective», Ziti Publications, Thessaloniki, ISBN: 960-431-768-7, Eudoxus code: 10971.
- Zhigang Xiang, Roy A. Plastock, Schaum's, «Outline of computer graphics», McGraw-Hill Professional, ISBN: 0071357815.