30234 - Graphic IT

Syllabus Information

Academic Year: 2019/20
Subject: 30234 - Graphic IT
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 439 - Bachelor's Degree in Informatics Engineering
ECTS: 6.0
Year: 4
Semester: First semester
Subject Type: ---
Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as:

1. Presentation of the theoretical contents of the syllabus by the teachers.
2. Autonomous development of two practical assignments, guided by the teachers, that build on top of the theoretical concepts.
3. Oral presentation of both assignments.

4.2.Learning tasks

The course includes the following learning tasks:

- Presentation of the theoretical contents of the syllabus by the teachers.
- Autonomous development of two practical assignments, guided by the teachers, that build on top of the theoretical concepts.
- Oral presentation of both assignments.

4.3.Syllabus

The course will address the following topics:

Computer Graphics

- What is Computer Graphics?
    - Introduction
    - Applications
- Geometry and modelling.
    - Transformations
    - Implicit geometries
- Light transport physics.
    - Render equation
    - Light source models
    - BRDF and material models
- Real-time
    - Rasterization
    - Projection matrices
    - Local lighting models (Gouraud, Phong,...)
- Render algorithms
    - Ray tracing
    - Path tracing
    - Photon mapping
- Participating media
    - Scattering
    - Light transport simulation
    - Translucency, subsurface scattering, skin
- Latest breakthroughs

Computational imaging

- What is an image?
    - Introduction
    - Applications
- Color spaces
- Convolutions and applications
- Dynamic range:
    - Color resolution.
    - High dynamic range images.
    - Tone mapping.
- Latest breakthroughs

4.4.Course planning and calendar

The calendar and schedule of theoretical classes will be provided by the EINA. Deadlines for both practical assignments and the date for the oral presentation will be announced with sufficient anticipation. The date for the (voluntary) global exam is also officially provided according to EINA's calendar.

4.5.Bibliography and recommended resources

No bibliography is needed