

BASIC DETAILS:

Subject:	MODELADO Y ANIMACIÓN		
Id.:	30089		
Programme:	GRADUADO EN INGENIERÍA INFORMÁTICA. PLAN 2008 (BOE 15/12/2008)		
Module:	INFORMATICA GRAFICA		
Subject type:	OPTATIVA		
Year:	3	Teaching period:	Primer Cuatrimestre
Credits:	3	Total hours:	75
Classroom activities:	36	Individual study:	39
Main teaching language:	Inglés	Secondary teaching language:	Castellano
Lecturer:		Email:	

PRESENTATION:

The subject covers an summarized approach to 3D computer graphics rendering and animation techniques.

Such fundamentals are meant to achieve a better understanding of visual data manipulation and the basic skills involved to achieve such behaviours using a commercial engine.

PROFESSIONAL COMPETENCES ACQUIRED IN THE SUBJECT:

General programme competences	G01	Leadership capacity to be able to influence a group so they achieve some specific objectives collectively and efficiently.
	G02	Innovative capacity to propose and find new and efficient ways to undertake any task and/ or function within the professional environment - highly motivated by quality.
	G03	Capacity to work in multidisciplinary teams to achieve common objectives, placing group interests before personal ones.
	G04	Capacity to always commit to working responsibly - creating a strong sense of duty and fulfilment of obligations.
	G05	Capacity to adapt to different environments while being positive and optimistic, orienting your behaviour towards the achievement of goals.
	G06	Capacity to analyse and find a solution to complex problems or unforeseen situations which may arise while working in any type of socio-economic organisation.
	G07	Capacity to work flexibly and with versatility to adapt to the needs and requirements of the work situation.
	G08	Ability to communicate effectively about different matters in a variety of professional situations and with the different media available.
	G11	Ability to get on in a multicultural or international environment, interacting with people of different nationalities, languages and cultures.
	G13	Capacity to use individual learning strategies aimed at continuous improvement in professional life and to begin further studies independently.
Specific programme competences	G15	Capacity to structure reality by means of linking objects, situations and concepts through logical mathematical reasoning.
	E02	Capacity to apply the intrinsic engineering principles based on mathematics and a combination of scientific disciplines.
	E03	Capacity to recognise the technical principles and apply the appropriate practical methods satisfactorily to analyse and solve engineering problems.
	E04	Capacity to maintain an open mind to innovation and creativity within the framework of the engineering profession.
	E06	Capacity to apply quality assurance processes to processes and products.
	E07	Capacity to work effectively in project teams, where appropriate assuming executive responsibilities, and consider the human, technological and financial sides.
	E08	Capacity to communicate productively with clients, users and colleagues both orally and in writing, so as to pass on ideas, solve conflicts and achieve agreements.
	E09	Capacity to maintain professional competences through independent learning and continuous improvement.

	E11	Capacity to remain up-to-date in the technological and business worlds in the area of information and communication technologies.
	E12	Capacity to manage complexity through abstraction, modelling, 'best practices', patterns, standards and the use of the appropriate tools.
	E13	Capacity to identify, assess and use current and emerging technologies, considering how they apply in terms of individual or organisational needs.
	E15	Capacity to understand and go along with the strategic objectives of the company where you are pursuing your professional career.
	E17	Capacity to identify and analyse user needs with the intention of designing effective, usable IT solutions which can be incorporated into the user's operating environment.
	E18	Capacity to identify and define the requirements to be satisfied by IT systems to cover the stated needs of organisations or individuals.
	E22	Capacity to undertake implementation tasks which require a high degree of technical awareness in different spheres (programming, configuration of hardware and communications equipment, etc.).
	E23	Capacity to design and implement security policies in order to preserve the integrity of the operational environment.
	E24	Capacity to draw up and develop effective project plans for systems based on information and communication technologies.
	E27	Capacity to write and maintain descriptive documentation of the origin, production and operability of IT systems.
Learning outcomes	R01	Handle terms related to computer animation.
	R02	Know and understand the basic techniques used in computer animation.
	R03	Use different computer 3D animation applications and discuss their potential and disadvantages.
	R04	Know the distinct areas where computer animation is applied.

PRE-REQUISITES:

The pre-requisites include object oriented programming knowledge and basic calculus, linear algebra and algorithmics. Being familiar with C# and Unity is a plus, but it is not strictly required.

SUBJECT PROGRAMME:

Subject contents:

1 - General Introduction
1.1 - Initial Overview, Basic Mathematics Review and Unity Basics
2 - Scene Features Setup
2.1 - Inclusion of Models, Illumination and Real Time Visualization
3 - Rendering and Shading Basics
3.1 - Introduction to Shading and Processing Approaches
4 - Animation Overview
4.1 - Basic Principles on Direct and Inverse Kinematics

Subject planning could be modified due unforeseen circumstances (group performance, availability of resources, changes to academic calendar etc.) and should not, therefore, be considered to be definitive.

TEACHING AND LEARNING METHODOLOGIES AND ACTIVITIES:

Teaching and learning methodologies and activities applied:

Theory/ Practice Sessions:

During these sessions, the contents featured in the subject will be exposed using resources like whiteboards, slideshows, etc., to show examples and illustrate properly the different sections. Additionally, active involvement will be encouraged through theoretical or real life case discussion. These sessions will be supported by different exercises.

Individual/ Team Exercises:

A significant part of the overall score will depend on individual exercises dealing with the different sections studied. These exercises will involve programming or tool usage and they are meant not to be independent, but interrelated, as new content is presented/ added in the course. Each exercise will consist of a set of instructions and certain results to be delivered before a specific date. Apart from individual work, a group activity will be developed forming teams and under similar conditions.

Presentations/ Individual Report Tests:

The main purpose of presentations is evaluating the knowledge acquired and underlying the processes and cases studied and explored in both lectures and exercises.

Tutorials:

The students will take part, on demand, in tutorials to be conducted on Wednesdays at 11:00 AM, but schedules may vary according to particular necessities or circumstances. The main goal pursued is to clear up doubts, and help students strengthen the knowledge and skills to be acquired. Just like with other subjects, the PDU is a useful communication tool to ask for/ share information on the course.

Student work load:

Teaching mode	Teaching methods	Estimated hours
Classroom activities	Master classes	16
	Practical work, exercises, problem-solving etc.	2
	Debates	1
	Coursework presentations	2
	Films, videos, documentaries etc.	1
	Laboratory practice	12
	Assessment activities	2
Individual study	Tutorials	4
	Individual study	7
	Individual coursework preparation	8
	Group coursework preparation	13
	Research work	4
	Recommended reading	3
Total hours:		75

ASSESSMENT SCHEME:

Calculation of final mark:

Individual coursework:	30	%
Group coursework:	30	%
Final exam:	20	%
Daily Observation:	10	%
Individual Report Test:	10	%
TOTAL	100	%

*Las observaciones específicas sobre el sistema de evaluación serán comunicadas por escrito a los alumnos al inicio de la materia.

BIBLIOGRAPHY AND DOCUMENTATION:

Basic bibliography:

HUGHES, John F., VAN DAM, Andries, MCGUIRE, Morgan, SKLAR, David.F, FOLEY, James D., FEINER, Steven K.,

AKELEY, Kurt. Computer Graphics. Principles and Practice. Third Edition. Madrid: Addison-Wesley, 2013.

Recommended bibliography:

OKITA, Alex. Learning C# Programming with Unity 3D. First Edition: Routledge, 2014

Recommended websites:

Unity Technologies	https://unity3d.com/es
Unity Asset Store	https://www.assetstore.unity3d.com/

* Guía Docente sujeta a modificaciones