

804130 - BETMA6-M - Specialization Block in Applied Multimedia Technologies VI

Coordinating unit: 804 - CITM - Image Processing and Multimedia Technology Centre
 Teaching unit: 804 - CITM - Image Processing and Multimedia Technology Centre
 Academic year: 2019
 Degree: BACHELOR'S DEGREE IN MULTIMEDIA STUDIES (Syllabus 2009). (Teaching unit Optional)
 ECTS credits: 6 Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: Bolarín Molina, Salvador
 Others: González García, Iñaki

Degree competences to which the subject contributes

Specific:

4. (ENG) Analitzar l'evolució i l'estat de l'art i identificar probables i/o desitjables escenaris futurs, de l'aplicació de les tecnologies multimèdia als àmbits de: la formació, la salut, l'oci o l'entreteniment i els negocis i activitats professionals.
5. (ENG) Aplicar nous coneixements teòrics i pràctics, relacionats amb la creació de continguts i aplicacions interactives multimèdia orientades al seu ús als àmbits de: la formació, la salut, l'oci o l'entreteniment i els negocis i activitats professionals.

Transversal:

1. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
2. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
3. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

Teaching methodology

(eng)

Learning objectives of the subject

(eng)

Study load

Total learning time: 150h	Hours large group:	0h	0.00%
	Hours medium group:	60h	40.00%
	Hours small group:	0h	0.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%



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Content

<p>Tema 1: Introduction to the CGI world.</p>	<p>Learning time: 2h 30m Practical classes: 1h Self study : 1h 30m</p>
<p>Description: (ENG) 1. Introduction to: Photography, Cinematography, Color, Geometry, Animation, Motion Graphic, and Visual Effects.</p> <p>Related activities: Ejercicios propuestos en la Práctica P01. Still Image Creation</p>	
<p>(ENG) Tema 2: Mathematical Concepts.</p>	<p>Learning time: 10h Practical classes: 4h Self study : 6h</p>
<p>Description: (ENG) 1. Vector calculation. 2D and 3D vectors. 2. Cross Product. Dot Product. 3. Notions of Trigonometry. 4. Matrices</p> <p>Related activities: Ejercicios propuestos en la Práctica P02. Plane extrusion for land creation.</p>	
<p>(ENG) Tema 3: Introduction to Nodal Work: Houdini.</p>	<p>Learning time: 10h Practical classes: 4h Self study : 6h</p>
<p>Description: (ENG)1.Command Line Tool 2. Textport (Hscript) 3. Vex & VOPS 4. Houdini Interface 5. Contextos y Operadores.</p> <p>Specific objectives: Ejercicios propuestos en la práctica P03. Exercises with VOPS</p>	

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<p>(ENG) Tema 4: Procedural Work</p>	<p>Learning time: 15h Practical classes: 6h Self study : 9h</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. Expressions, Variables, Functions, Arguments and Attributes. 2. Classes: Points, Primitives, Vertex, Detail. 3. Types: Integers, Floating, Vectors, String. 4. Intro Proceduralism. 5. Basic Operators <p>Related activities:</p> <p>(ENG) . Exercicis proposats en la Pràctica P04. Procedural Modeling</p>	
<p>(ENG) Tema 5: Animation</p>	<p>Learning time: 10h Practical classes: 4h Self study : 6h</p>
<p>Description:</p> <ol style="list-style-type: none"> 1. TAB en sceneView/ TAB in network. 2. Animación, Keyframe, AutoKey, RealTime, Global Animation Option. 3. Time-Dependent Node, Geo Node, Transform Node, Pivot Transform, Line Node. 4. Effector Spline. 5. Scope Parameters, Animation Editor. 6. Real-Time. <p>Related activities:</p> <p>(ENG) Exercises proposals en la Pràctica P05. Organic growth of geometry.</p>	
<p>(ENG) Tema 6: Lighting, Shading and Render I (Mantra)</p>	<p>Learning time: 12h 30m Theory classes: 7h 30m Practical classes: 5h</p>
<p>Description:</p> <p>(ENG)</p> <ol style="list-style-type: none"> 1. Lights 2. Material Settings 3. Principled Shader 4. Mantra Surface Shader 5. Render Setting <p>Related activities:</p> <p>Ejercicios propuestos en la Práctica P06. Look Dev Exercise I -II</p>	

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<p>(ENG) Tema 7: Lighting, Shading and Render II (Redshift)</p>	<p>Learning time: 15h Practical classes: 6h Self study : 9h</p>
<p>Description: (ENG)</p> <ol style="list-style-type: none"> 1. Lights 2. Material Settings 3. Principled Shader 4. Redshift Surface Shader 5. Render Setting <p>Related activities: Ejercicios propuestos en la Práctica P07. Look Dev Exercise I -II</p>	
<p>(ENG) Tema 8: Introduction to Point-Based Effects Design</p>	<p>Learning time: 15h Practical classes: 6h Self study : 9h</p>
<p>Description: (ENG)</p> <ol style="list-style-type: none"> 1. Points, points and points. 2. Effects animating points with noise without Simulation 3. Effects animating points with Simulation (Particles) 4. Intro to Particles Operators (POPS) 5. Enter Dynamics Context (DOPS) <p>Related activities: (ENG) Exercises proposals en la Pràctica P08. Creation of clouds with Volumes.</p>	

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<p>Tema 09: Introduction to the design of Volume-based Effects.</p>	<p>Learning time: 12h 30m Theory classes: 5h Self study : 7h 30m</p>
<p>Description:</p> <p>355/5000</p> <ul style="list-style-type: none"> - Static volumes without Simulation <ul style="list-style-type: none"> - With noise at SOP level - Creation of Fog and Clouds - Volumes with Simulation <ul style="list-style-type: none"> -Creation of Volume in SOP -> DOPS (Smoke Solver) > SOP -Volumen Field (Density, Velocity, Temperature) - Houdini Native Volume vs VDB Volume - Vops Volume and Wrangle Volume <p>Related activities: Exercicis proposats en la Pràctica P09. Explosion and Fading Simulation.</p>	
<p>(ENG) Tema 10: Introduction to Fluid Design</p>	<p>Learning time: 15h Practical classes: 6h Self study : 9h</p>
<p>Description:</p> <ul style="list-style-type: none"> - Theoretical Foundations - Flip Fluid Solver = Pop Solve+Smoke Solver - Point, Surface Field, and Velocity Field - Whitewater: Foam, Spray, and Bubble. <p>Related activities: (ENG) . Exercicis proposats en la Pràctica P10. Fluid Simulation with Voxels I</p>	

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<p>(ENG) Tema 11: Introduction to L-System.</p>	<p>Learning time: 15h Practical classes: 6h Self study : 9h</p>
<p>Description:</p> <ul style="list-style-type: none"> - Fractal Properties. <ul style="list-style-type: none"> - Syntax rules. - Turtle Command. - Branches. - Use of multiple L-System Rules. - Inputs. <p>Related activities:</p> <p>Exercises proposals en la Pràctica P11. Creating a model with L-SYSTEM.</p>	
<p>(ENG) Tema 12: Operator Review</p>	<p>Learning time: 9h Practical classes: 3h Self study : 6h</p>
<p>Description:</p> <p>(ENG)</p> <ul style="list-style-type: none"> - Geometry: Geometry, File, Sphere, Box, Torus, Grid, Tube, Line, Merge, Transform, Circle, Color, Mountain, Facet, Clip, Add, Visualize, Trail, Attribute Create, Attribute Randomize, Scatter, Copy, Copy To Points, Attribute Delete, PolyExtrude, Delete, Divide, Group, Blast, Boolean, PolyBevel, Null, Resample, UVTexture, Polyframe, Skin , Vdb , From Polygons, Visibility, VDB Visualize Tree, Volumen Visualization. -Attribute Wrangle : Attribute vs Variable, Functions Points(), Length(), fit(), fit01(), set(), rand(), cos(), sin(), dot() ,cross() -PointVop: VectorToFloat, FloatToVector, Add, AANoise, Lenght, Fit, Cross, Dot, Normalize, Sin, Cos, Mix, Abs, Ramp Parameter. - Volumen Vop: VectoFloat, Fit, Add, AANoise, Volumen Sample File, Ramp Parameters, Mulconst, Multiply. - Object Merge, DopImport, GroupDelete, DopImportField, Rop Geometry Output. - DOP Network: PopSolver, PopObject, PopSource, PopForce, PopDrag, GroundPlane, Gravity. - Smoke Solver, Smoke Object, VolumenSource, GasResizeFluidDynamic, - Cam - Mantra - Principled Shader <p>Related activities:</p> <p>(ENG) . Exercises proposals en la Pràctica P12. Dynamic Creation of a City.</p>	

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Planning of activities

<p>(ENG) PRÁCTICA P01: Still Image Creation. Houdini.</p>	<p>Hours: 12h Practical classes: 2h Self study: 10h</p>
<p>Description: (ENG) El ejercicio consiste en realizar una serie de imágenes mediante el uso de luz y materiales.</p> <p>Support materials: Hoja de Práctica P01 cmapus CITM</p> <p>Specific objectives: (ENG) 1. Use of textures 2. Lighting Configuration 3. Application of Materials 4. Introduction to Rendering</p>	
<p>(ENG) PRÁCTICA P02: Extrusion of the land creation plan.</p>	<p>Hours: 12h Practical classes: 2h Self study: 10h</p>
<p>Description: (ENG) The exercise consists of making extrusions on a subdivided plane, to which we apply color information creating as a final image a pixelated terrain known as the 3D Pixel Landscapes effect. The use of depth of field helps to enhance this effect.</p> <p>Support materials: (ENG) Hoja de Práctica P02 cmapus CITM</p> <p>Specific objectives: (ENG) 1. Use of the camera 2. Use of Depth of Field 3. Units in Houdini 4. Extensive use of the extrusion tool 5. Rendering</p>	
<p>(ENG) PRÁCTICA P03: VOPS works</p>	<p>Hours: 12h Practical classes: 2h Self study: 10h</p>
<p>Description: (ENG) Series of exercises consisting of exploring the creative possibilities of the tools in the VOPS Context</p> <p>Support materials: (ENG) Hoja de Práctica P03 campus CITM</p>	

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Specific objectives:

(ENG)

1. Works with Command Line Tool
2. Use of Textport (Hscript)
3. Differences between Vex & VOPS
4. Houdini Interface
5. Contexts and Operators.

(ENG) PRÁCTICA P04: Procedural Modeling

Hours: 15h

Practical classes: 5h

Self study: 10h

Description:

(ENG) The exercise consists in the realization of a facade of a building in a procedural way.

Support materials:

(ENG)

Hoja de Práctica P03
campus CITM

Specific objectives:

(ENG)

Exercise to make contact with Procedural Modeling and important terms to understand:

1. Expressions, Variables, Functions, Arguments and Attributes.
2. Classes: Points, Primitives, Vertex, Detail.
3. Types: Integers, Floating, Vectors, String.
4. Intro Proceduralism.
5. Basic Operators

(ENG) PRÁCTICA P05: Organic Geometry
Growth

Hours: 12h

Practical classes: 2h

Self study: 10h

Description:

(ENG)

In this practice the student analyzes and applies the knowledge to manage and apply geometry growth techniques.

Support materials:

(ENG)

- Hoja de Práctica 5
- campus CITM

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Specific objectives:

(ENG)

Parameters that will be used in the exercise:

1. TAB in scene view / TAB in the network.
2. Animation, Keyframe, AutoKey, RealTime, Global Animation Option.
3. Time-Dependent Node, Geo Node, Transform Node, Pivot Transform, Line Node.
4. Effector Spline.
5. Scope Parameters, Animation Editor.
6. Real-Time.

PRÀCTICA P06: LookDev CPU Mantra

Hours: 14h

Practical classes: 4h

Self study: 10h

Description:

(ENG) The exercise involves the visual development of a scene using a CPU-based render engine. Mantra Render.

Support materials:

(ENG) Hoja de pràctica P03
campus CITM

Specific objectives:

Extensive use of:

1. Lights
2. Material Settings
3. Principled Shader
4. Mantra Surface Shader
5. 3D Reconstruction.

Qualification system

Practical exercises.

- Completion of between 5 to 8 Exercises with a weight of 30% of the course.
- Final practice with a 20% weighting

Partial exams.

- 2 Test exams with a weighting of 20% each.

The attitude of Learning and Participation of the student: 10% of the final mark of the subject.

Regulations for carrying out activities

(eng)

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Bibliography

Complementary:

Susan Zwerman y Jeffrey A. Okun. The VES Handbook of Visual Effects: Industry Standard VFX Practices and Procedures. Focal Press, 2014.

Eran Dinur. The Filmmaker's Guide to Visual Effects: The Art and Techniques of VFX for Directors, Producers, Editors and Cinematographers. Focal Press, 2017. ISBN 9781849696685.

Craig Zerouni. Houdini On the Spot: Time-Saving Tips and Shortcuts from the Pros. 2012. ISBN 978-1138133211.

William Michael Cunningham. The Magic of Houdini. Focal Press, ISBN 978-1598630824.

Others resources: