804225 - M3D - 3D Modelling

Coordinating unit: 804 - CITM - Image Processing and Multimedia Technology Centre
Teaching unit: 804 - CITM - Image Processing and Multimedia Technology Centre
Academic year: 2018
Degree: BACHELOR'S DEGREE IN VIDEO GAME DESIGN AND DEVELOPMENT (Syllabus 2014). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan, Spanish, English

Teaching staff
Coordinators: Belmonte Martínez, Pablo

Degree competences to which the subject contributes

Specific:
1. (ENG) Dissenyar, modelar, texturitzar i animar objectes, personatges i escenes 2D i 3D per la seva inclusió en projectes digitals, seqüències audiovisuals i videojocs.
2. (ENG) Dominar el gran abanico de herramientas profesionales del sector para la elaboración de contenidos digitales de todo tipo.
3. (ENG) Representar de forma esquemática i visual conceptes, idees i / o dades complexes a partir d'habilitats personals i referències externes, amb l'objectiu de transmetre atractiu, originalitat i creativitat.

Transversal:
4. 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.
5. 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.
6. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

Teaching methodology
(eng)

Learning objectives of the subject
(eng)
## 804225 - M3D - 3D Modelling

### Study load

<table>
<thead>
<tr>
<th><strong>Total learning time:</strong> 150h</th>
<th>Hours large group:</th>
<th>24h</th>
<th>16.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>16h</td>
<td>10.67%</td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>20h</td>
<td>13.33%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## Content

### 1. 3D Software introduction

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 12h 30m</th>
</tr>
</thead>
<tbody>
<tr>
<td>· DDC.</td>
<td>Practical classes: 3h</td>
</tr>
<tr>
<td>· 3D Software history.</td>
<td>Guided activities: 2h</td>
</tr>
<tr>
<td>· Professional Software.</td>
<td>Self study : 7h 30m</td>
</tr>
<tr>
<td>· Software interface.</td>
<td></td>
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<tr>
<td>· Menus Customization.</td>
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<tr>
<td>· Viewing Menus.</td>
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<tr>
<td>· Standar primitives creation.</td>
<td></td>
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<tr>
<td>· 3D software management.</td>
<td></td>
</tr>
</tbody>
</table>

**Specific objectives:**
P01

### 2. Poly modelling

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 10h 30m</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Copy / Instance / X Ref.</td>
<td>Practical classes: 3h</td>
</tr>
<tr>
<td>· Basic compound objects (loft, booleans).</td>
<td>Guided activities: 2h</td>
</tr>
<tr>
<td>· Components selection.</td>
<td>Self study : 5h 30m</td>
</tr>
<tr>
<td>· Loops &amp; rings.</td>
<td></td>
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<tr>
<td>· Poly modelling tools.</td>
<td></td>
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<tr>
<td>· Polycount.</td>
<td></td>
</tr>
<tr>
<td>· Modelling history.</td>
<td></td>
</tr>
<tr>
<td>· Lowpoly work.</td>
<td></td>
</tr>
<tr>
<td>· Work management techniques.</td>
<td></td>
</tr>
<tr>
<td>· HyperGraph and node working.</td>
<td></td>
</tr>
</tbody>
</table>

**Related activities:**
P02
### 3. Poly modelling techniques

**Learning time:** 12h 30m  
Practical classes: 3h  
Guided activities: 2h  
Self study: 7h 30m

**Description:**
- 2D blueprints setup and usage.
- Advanced modelling tools.
- Simple props modelling.
- Attach and basic deformators (Shell, symmetry...)
- NURBS modelling.
- Modelling with deformators.
- Level of detail (LODs).

**Related activities:**
P03

### 4. Character modelling

**Learning time:** 12h 30m  
Practical classes: 3h  
Guided activities: 2h  
Self study: 7h 30m

**Description:**
- Character modelling.
- Blueprints and preproduction.
- Anatomy, topology, volumes, syluete, polygon flow and quads.
- T-shapes, non manifold geometry, nGons.
- Modelling from basic topologies.
- Human body modelling.
- Poly by poly modelling.
- Face modelling.

**Related activities:**
P04
## 5. Character modelling 2 + hard edge geometries

**Learning time:** 12h 30m  
- Practical classes: 3h  
- Guided activities: 2h  
- Self study: 7h 30m

### Description:
- Human body modelling ? Body, legs, arms and hands.  
- Hair modelling, hi poly and low poly techniques.  
- Hi poly modelling techniques.  
- Hard surfaces.  
- Poly subdivision.  
- Subdivision surfaces and poly objects.  
- Poly reduction remeshing.

### Related activities:
- P05

## 6. Digital sculpture

**Learning time:** 12h 30m  
- Practical classes: 3h  
- Guided activities: 2h  
- Self study: 7h 30m

### Description:
- Digital sculpture tools in 3dsMAX.  
- Brief history of digital sculpture softwares.  
- Modelling method changed.  
- Autodesk Mudbox / Pixologic zBrush  
- Preparing geometry for avoiding problems.  
- Subdivision levels.  
- Modelling brushes.  
- Layers.  
- Viewport filters.  
- Scene rendering.

### Related activities:
- P06
### 7. Materials

**Description:**
- Materials and shading tree.
- Materials editor.
- Multimaterials.
- Procedural textures.
- Texture editor.
- Texture maps and simple wrapping.
- Texture layers.
- Vertex colors.

**Related activities:**
P07

**Learning time:** 12h 30m  
Practical classes: 3h  
Guided activities: 2h  
Self study: 7h 30m

### 8. UV Unwrapping

**Description:**
- UVs understanding.
- UV unfolding.
- UV packing.
- UV sets.
- Unfold and relax.
- Transfer maps.
- UVs exporting to Photoshop.
- Multi tile texturing.

**Related activities:**
P08

**Learning time:** 12h 30m  
Practical classes: 3h  
Guided activities: 2h  
Self study: 7h 30m
### 9. Character texturing

**Description:**
- Advanced unwrapping.
- UV right packing.
- Size and quantity of textures per model.
- Hide UV seams.
- UV Layout.
- Ambient Occlusion painting.
- Rendermaps.
- Photoshop texture painting.

**Related activities:**
- P09

**Learning time:** 12h 30m  
- Practical classes: 3h  
- Guided activities: 2h  
- Self study: 7h 30m

### 10. Normal mapping

**Description:**
- Normal maps.
- Normal map extraction.
- Normal maps application.
- Normal maps visualization.
- Other non texture maps: color, displacement, occlusion.
- Vector displacement maps.
- Parallax mapping.

**Related activities:**
- P10

**Learning time:** 12h 30m  
- Practical classes: 3h  
- Guided activities: 2h  
- Self study: 7h 30m
### 11. Digital painting

**Description:**
- Mudbox / Zbrush for digital painting.
- Painting brushes.
- Painting layers.
- Blending modes.
- Working without UVs: PTEX
- Model transfer mapping.
- Mudbox - Zbrush/3dsMAX.

**Related activities:**
P11

**Learning time:** 12h 30m
- Practical classes: 3h
- Guided activities: 2h
- Self study: 7h 30m

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### 12. Retopology

**Description:**
- Hipoly vs Lowpoly.
- Videogames poly limitation.
- Clean geometry.
- Animation modelling.
- 3dsMAX retopology.
- Mudbox / Zbrush retopology.
- Other retopology softwares.

**Related activities:**
P12

**Learning time:** 12h 30m
- Practical classes: 3h
- Guided activities: 2h
- Self study: 7h 30m
Planning of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours:</th>
<th>Self study:</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 - Characters</td>
<td>8h</td>
<td>8h</td>
</tr>
</tbody>
</table>

**Description:**
Final practice 15% - Basic full body character creation, symetric and skinning, rigging and animation ready.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours:</th>
<th>Self study:</th>
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</thead>
<tbody>
<tr>
<td>Name English</td>
<td>10h</td>
<td>10h</td>
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</tbody>
</table>

**Description:**

Qualification system

(eng)

Bibliography

Others resources: