DEGREE PROGRAM IN TECNOLOGIE E LINGUAGGI DELLA COMUNICAZIONE - TECHNOLOGIES AND LANGUAGES OF COMMUNICATIONS (LM-59) CURRICULUM IN INTERACTION DESIGN

A.Y. 2023/2024

Course Computer graphics, modelling & 3D printing
SDS INF/01
ETCS 6
Course modules (if any) None
Year II year
Semester I semester
Professor(s) Antonio De Lorenzo
e-mail a.delorenzo@unilink.it
Office hour At the end of the lesson or by appointment agreed by e-mail.

LEARNING OUTCOMES

The aim of the course is to achieve the following learning outcomes:

1. **KNOWLEDGE AND UNDERSTANDING SKILLS:** Acquisition of the theoretical and methodological elements useful for a correct approach to the practical use of 2D and 3D computer graphics and visual communication.
2. **APPLIED KNOWLEDGE AND UNDERSTANDING SKILLS:** Learning of design and predictive methods and technical elements preparatory to the use of the main software for the processing of 3D models, digital images, animation and 3D printing.
3. **AUTONOMY JUDGMENT:** Development of the ability to analyze and understand the different application areas of Computer Graphics, styles and forms of digital visual communication.
4. **COMMUNICATION SKILLS:** Development of static and animated 3D models into personal images and videos for communication (Storytelling).
5. **LEARNING ABILITY:** Autonomous development of production pipelines.

DETAILED PROGRAM

The course addresses, in detail, the following topics with guided practical exercises in class and assigned tasks:

1. General introduction to the course (didactic program, objectives, examination of the software used and teaching material), method and development of a production pipeline.
2. Principles of storytelling and visual communication.
3. Overview of 2D and 3D software and use of Blender as Open Source 2D and 3D software.
4. Graphical interface (GUI) and modus operandi. Constituent geometric elements, point, edge and polygons and generalist production pipeline.
5. Geometric primitives and use to assemble basic and blocking models.
6. Linear and non-linear modifiers
7. The Modifiers
8. Splines and other constructive entities
9. Subdivision surfaces
10. Light sources and lighting principles
11. Materials and textures
12. The Camera

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13. Keyframe animation with Timeline
14. Development of complex models by subdivision of complexity
15. – 3D Boolean operators
16. – Free and commercial Plug-ins
17. - Model a chessboard
18. - Define logos and logotypes using starting vector graphics
19. Use of ready-made 3D model libraries (free or paid) and their modification.
20. 3D printing of models

TEACHING METHODOLOGIES

Face-to-face and remote lessons
Practical use of the software in the classroom
Development and delivery of personal product material
Assigned exercises

METHOD OF CONDUCTION OF THE EXAM

Power Point presentation of the 3D graphic production pipeline learned with images, text and videos on personal exercise steps (3D model with geometric primitives, use of subdivision surfaces to develop complex models of shoes, airplanes, etc. including materials, textures and lighting, use and modification of library materials, creation of a complete chessboard, final video of a logo.
PowerPoint example provided in attachment.

The final exam will evaluate:
- Pagination of the PowerPoint paper to be delivered
- Content in videos and images
- Synthesis and Storytelling

EVALUATION CRITERIA

At the end of the course, the following skills of the student will be evaluated:
1. **KNOWLEDGE AND UNDERSTANDING SKILLS:** Blender interface and methods
2. **APPLIED KNOWLEDGE AND UNDERSTANDING SKILLS**: Development of a personal production pipeline
3. **AUTONOMY JUDGMENT:** Development of production pipelines based on the areas of application
4. **COMMUNICATION SKILLS:** visual story telling on static images or animations.
5. *LEARNING ABILITY:* personal developments and productive refinements

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FINAL GRADING INFORMATION AND CRITERIA

The final score is expressed in thirtieth grade, with the possibility of honors. The final score reflects the student's preparation as follows:

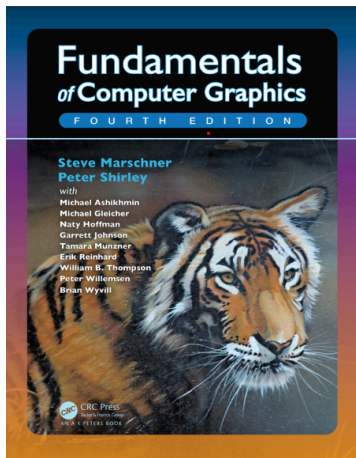| Score	Description
< 18 not sufficient	Fragmentary and superficial knowledge of contents, errors in applying concepts, insufficient exposure.
18-20	Sufficient but still general knowledge of contents, elementary exposure, uncertainties in the application of theoretical notions.
21-23	Appropriate, but not deep, knowledge of contents, good ability in applying theoretical notions as well as presenting them in a simple way.
24-25	Appropriate and vast knowledge of contents, discrete ability in applying them, good ability in presenting notions in a comprehensive way.
26-27	Precise and comprehensive knowledge of the topics, good ability in applying the acquired knowledge, good analytical skills, clear and correct exposure.
28-29	Extensive, comprehensive and deep knowledge of contents, good applicative skills, good ability of analysis and synthesis, confident and correct exposure.
30 30 with honors	Very broad, comprehensive and deep knowledge of the contents, well-established ability to apply the acquired notions, excellent ability of analysis, synthesis as well as ability to create interdisciplinary links, fluency of exposure.

COURSE MATERIAL

For the preparation of the exam, in addition to the material provided during the lessons, the following **mandatory texts** are needed:

To prepare for the exam, it is essential to integrate the contents provided during the lessons with the following mandatory texts:

1. Program, materials, texts and videos present on the portal of the free 3D software used

https://www.Blender.org

2. Fundamental of Computer Graphics 4th edition freely and freely downloadable in the link provided:

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http://repo.darmajaya.ac.id/5422/1/Fundamentals%20of%20Computer%20Graphics%2C%20Fourth%20Edition%20%28%20PDFDrive%20%29.pdf

The following **supplementary texts** provide support to the students who are unable to take part in the lessons as well as in all the teaching activities:
    None

Other **suggested texts**, in order to delve into the treated topics, are the following:
    None

OTHER ADVICES

Students belonging to the 'part-time/workers' category or being unable to take part in the lessons are suggested to directly contact the professor in order to analyze, together, specific training needs.