KAPI'OLANI COMMUNITY COLLEGE
University of Hawai'i
COURSE OUTLINE (Form: 02/02/02)

ART 247 Lighting and Rendering

1. COURSE INFORMATION: (10/28/04)

ART 247 Lighting and Rendering (3 credits) AA/DA
6 hours lecture/lab per week

Prerequisite: ART 226 3D Computer Graphics II with a grade of "C" or higher; approval of the Lighting and Rendering entrance portfolio review or acceptance into a NMA AS specialization.

ART 247 is a studio course to explore ways to use lighting, texturing, and rendering to enhance mood and character in the 3D digital environment. Emphasis will be placed on developing an aesthetic criteria for evaluation.

Comment: Students must pay an additional fee of $125 for ART 247. This course may not be audited.

2. COURSE OBJECTIVES/COMPETENCIES:

Upon successful completion of ART 247, the student should be able to:

- Analyze lighting design: modeling with light, visual function of shadows, use of color, control of exposure, and use those principles to create strong compelling compositions.
- Demonstrate a working knowledge of the perspective of 3D models and the resulting effects of projected light sources in shadow, color, shade, texture, and atmospheric effects.
- Apply the concepts and techniques of cinematography, photography, and traditional visual arts to achieve convincing reality and atmosphere in the 3D digital world.
- Demonstrate skills to use digital lighting for the purpose of storytelling and visual communication.
- Experiment with a wide range of styles from photo-realistic to painterly to cartoon-style.
- Analyze and demonstrate the methods of rendering, how to control renders, and how to render for the desired effect.
- Use problem-solving strategies to complete the creative process from concept development through revisions to final output.
- Use the vocabulary of 3D lighting and rendering as well as the language of art to critically evaluate final rendered compositions and to aid in the integration of the technological skill with an aesthetic criterion.

- Apply the visual elements of line, shape, value, color, texture, space, time, and motion as well as the design principles of balance, rhythm, emphasis, contrast, variation, repetition, and unity in digital projects.
- Work effectively as a team member to achieve creative decisions.
- Demonstrate strong group communication skills and the ability to speak clearly during critiques.
- Write about and defend the conceptual merits of work produced for the course.

3. GENERAL EDUCATION AND RELATIONSHIP TO OTHER COURSES:

ART 247 is a required course in the Associate in Science degree in New Media Arts with a specialization in Animation.

ART 226 is a prerequisite because students need to know introductory 3D concepts and techniques taught in that class before they take this course.

This course supports the following college competency areas:

- Computation and communication abilities
- Values for living
- Quality of life as affected by technology and science
- Awareness of the dynamics in contemporary issues
- Problem-solving and decision-making abilities
- Responsiveness to the arts and humanities
- Career choices and life-long learning
- Study in a selected program

This course also satisfies the following Associate in Science degree, and/or Associate in Arts degree competencies:

After the successful completion of this course a student should be able to:

AS
- Recognize effects of technology and science on the natural and human environments.
- Understand contemporary issues and problems and respond to the impact of current conditions.
- Demonstrate proficiency in conceptual, analytical, and critical modes of thinking.
- Develop insights into human experience and apply them to personal, occupational, and social relationships.
- Recognize relevance of career choices to life-long learning.
- Demonstrate competence in a selected program of study.

AA
Critical Thinking:
Critical thinking, an analytical and creative process, is essential to every content area and discipline. It is an integral part of information retrieval and technology, oral communication, quantitative reasoning, and written communication. Upon completion of an A.A. degree, the student should be able to:

- Identify and state problems, issues, arguments, and questions contained in a body of information.
- Identify and analyze assumptions and underlying points of view relating to an issue or problem.
- Recognize and understand multiple modes of inquiry, including investigative methods based on observation and analysis.
- Synthesize information from various sources, drawing appropriate conclusions.
- Reflect upon and evaluate their thought processes, value systems, and worldviews in comparison to those of others.

AA
Information Retrieval and Technology:
Information retrieval and technology are integral parts of every content area and discipline. Upon completion of an A.A. degree, the student should be able to:

- Use print and electronic information technology ethically and responsibly.
- Demonstrate knowledge of basic vocabulary, concepts, and operations of information retrieval and technology.
- Create, manage, organize, and communicate information through electronic media.
- Recognize changing technologies and make informed choices about their appropriateness and use.

AA
Oral Communication:
Oral communication is an integral part of every content area and discipline. Upon completion of an A.A. degree, the student should be able to:

- Identify and analyze the audience and purpose of any intended communication.
- Gather, evaluate, select, and organize information for the communication.
- Use language, techniques, and strategies appropriate to the audience and occasion.
- Speak clearly and confidently, using the voice, volume, tone, and articulation appropriate to the audience and occasion.
- Use competent oral expression to initiate and sustain discussions.

AA -
Quantitative Reasoning:
Quantitative reasoning can have applications in all content areas and disciplines. Upon completion of an A.A. degree, the student should be able to:

- Apply numeric, graphic, and symbolic skills and other forms of quantitative reasoning accurately and appropriately.
- Demonstrate mastery of mathematical concepts, skills, and applications, using technology when appropriate.
- Define quantitative issues and problems, gather relevant information, analyze that information, and present results.

AA
Written Communication:
Written communication is an integral part of every content area and discipline. Upon completion of an A.A. degree, the student should be able to:

- Use writing to discover and articulate ideas.
- Identify and analyze the audience and purpose for any intended communication.
- Choose language, style, and organization appropriate to particular purposes and audiences.
- Gather information and document sources appropriately
- Develop a main idea clearly and concisely with appropriate content.

AA
Understanding Self and Community:
UH-Kapi`olani emphasizes an understanding of one's self and one's relationship to the community, the region, and the world. Upon completion of an A.A. degree, the student should be able to:

- Examine critically and appreciate the values and beliefs of their own culture and those of other cultures separated in time or space from their own.

A. Communicate effectively and acknowledge opposing viewpoints.

ART 247 satisfies the following departmental and/or program competencies:

Upon successful completion of the Associate in Science degree in New Media Arts**,** the students should be able to:

- Identify and effectively apply conceptual thinking skills that are important in animation, interface design and information architecture.
- Identify and effectively apply animation, graphic and interface design principles in the development of screen-based media.
- Describe and draw conclusions about the relation interface design, animation and information architecture have to the contemporary world.

- Create works that demonstrate an understanding of the history, theory, and aesthetics of multimedia production.
- Demonstrate successful problem solving that results from experimentation, exploration, and the taking of risks during the creative problem solving process.
- Effectively apply skills that are important in digital image and sound input, manipulation, and output.
- Effectively apply skills that are important in digital image processing, sound editing and multimedia authoring software.
- Demonstrate effective use of programming to create animation, interface design and information architecture appropriate to the audience and purpose.
- Create materials to convey the developmental stage of multimedia projects.
- Work as a team member to make collaborative decisions when appropriate and exercise independent judgment when appropriate.
- Communicate clearly and effectively in working groups and during critiques.
- Effectively write about and defend course work conceptually.

In addition to demonstrating the core degree competencies, the students successfully completing the Animation specialization should be able to:

- Identify and effectively apply conceptual thinking skills that are important in animation.
- Identify and effectively apply design and animation principles in the development of animation.
- Create animation in 2D and 3D formats.
- Demonstrate competence with 2D and 3D animation software.
- Demonstrate skills with editing and compositing software.
- Use 3D modeling, texturing, and rendering techniques effectively in the creation of animation.
- Draw a variety of styles of illustrations for use in computer-based products.
- Create electronic production and presentation materials to convey the developmental stage of animation projects.
- Demonstrate the basic techniques of character and narrative development as applied to animation.

4. COURSE CONTENT:

   A. History and Aesthetics: 20%
      - Historical introduction of lighting in cinematography and traditional photography
      - Analyze lighting design in traditional visual art
      - Explain fundamental theoretical concepts in digital lighting that differ from real-world lighting

B. Lighting: 30%

- Explore the use of light to effectively tell a story
- Explore 3D digital lighting skills for shade, shadows, color, texture, and atmosphere
- Understanding "real-world" lighting and how to achieve that in the digital world
- Explore advanced concepts in texture mapping and 3D procedural textures

C. Rendering: 30%

- Effectively use software and hardware renders to achieve the desired result and renders for compositing where appropriate

D. Evaluation and analysis of projects and written papers 20%

- Aesthetic evaluation of project based on principles of design
- Technical evaluation of project also including creative and innovative application of technology
- Clearly written statement and analysis of projects using appropriate vocabulary

5. POSSIBLE TEXTS:

While addressing the content of the course, texts and handouts will change to accommodate the availability of new course references on the field of multimedia. Required readings will be via on-line resources.

Weinman, Lynda. Photoshop 5 HOT. Berkeley, CA: Peach Pit Press, 2002.
Birn, Jeremy. Digital Lighting and Rendering. Indianapolis, Indiana: New Riders Publishing, 2000.
Demers, Owen. Digital Texturing and Painting. Indianapolis, Indiana: New Riders Publishing, 2002.

REFERENCE MATERIALS:

Current suggested reference texts include:

Brinkman, Ron. The Art and Science of Digital Compositing. San Diego, CA: Morgan Kaufmann, 1999.

DVD
Visions of Light: The Art of Cinematography. Cinematography Documentary

Reference materials will also be available in class and via on-line resources.

Additional materials will include backup disks such as zip disks and printer paper.

AUXILIARY MATERIALS AND CONTENT:

Students will use a variety of graphical and Internet software. This software and the infrastructure supporting its use are existing resources of New Media Arts.

6. METHOD OF INSTRUCTION:

The method of instruction will include lectures, studio demonstrations, project development, individual instruction, group discussions, and critiques. Examples are presented when important to describe course content. Class projects and procedures are the focus of many course discussions.

7. METHOD OF EVALUATION:

A. Projects Assignments 90%

a. Clarity of Conceptual Thinking 45%
Students will demonstrate their conceptual thought process about project assignments by turning concept sketches into fully realized 3D compositions based on project guidelines. Students will also show their thinking by submitting clearly written, well-conceptualized statements, by showing strong group communication skills and demonstrating the ability to speak clearly during critiques.

b. Quality of Execution of Assignments 45%
Each student will be expected to create projects that demonstrate their technical and artistic ability to execute lighting and rendering techniques based on project guidelines. Additionally, they will complete tutorials and projects that demonstrate their ability to execute specific software techniques. The aesthetic quality of these techniques and materials will be assessed in the final grade evaluation based on the successful application of the visual elements of line, shape, value, color, texture, space, time and motion as well as the design principles of balance, rhythm, emphasis, contrast, variation, repetition, and unity.

B. Participation/Attendance 10%

Students will be expected to participate as active class members. This includes attending all classes; meeting intermediate and final project deadlines; completing production time outside of class in the lab environment; and participating as dependable team members.

GRADING SYSTEM:

A 90-100	B 80-89	C 70-79	D 60-69	F 0-59

Whatever method of evaluation is used, it is understood that the instructor reserves the right to make necessary and reasonable adjustments to the evaluation policies outlined.

ART 247 may not be repeated for credit. This course may not be audited.

8. JUSTIFICATION:

   A. ART 247 is a required course in the Associate in Science degree in New Media Arts with a specialization in Animation.

   B. The Animation curriculum has been revised, updated and submitted to the Curriculum Committee for review. To be able to offer this course during the approval process, it has been offered as an experimental course at KCC.

   C. This course will not decrease or increase the number of required credits for an AS degree in NMA.

9. RESOURCE REQUIREMENTS:

   This class requires the use of a multimedia computer lab with Internet connectivity, graphical software and a presentation system for class presentation. These resources are currently being met through existing resources in the NMA labs.

   This course does not impact other department course offerings.

   The maximum enrollment per class section is fifteen students. It is estimated that one section will be offered per semester.

10. ARTICULATION:

   A. This course is not offered at other UH campuses.

   B. This course is appropriate for articulation with UH Manoa General Education Core Requirements. Students would receive credit in the area of Diversification Arts (DA).

   C. This course is appropriate for articulation with the Academy for Creative Media and with Art Departments/Programs throughout the UH System through the University of Hawai'i System Articulation Agreement: ART.