SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: Lighting/Rendering

CODE NO. : VGA401 **SEMESTER:** 4

PROGRAM: Video Game Art

AUTHOR: Jeremy Rayment

DATE: August, 2014 **PREVIOUS OUTLINE DATED:** August, 2013

APPROVED: "Colin Kirkwood" Aug/14

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DEAN **DATE**

TOTAL CREDITS: 4

PREREQUISITE(S): VGA303

HOURS/WEEK: 4

Lighting and Rendering   VGA401

I.   COURSE DESCRIPTION:

At the end of this course students will be well versed in lighting techniques for rendering both in-game and for their portfolios. Fundamental topics will include lighting theory, 3 point lighting, composition and layout, render quality, and pipeline techniques to optimize workflows and efficiency.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1.   Demonstrate the ability to effectively research, analyze, critique and discuss lighting in existing games.

     Potential Elements of the Performance:

     Describe the foundational elements of traditional light theory

     Identify the key differences between traditional lights and digital lights as it pertains to industry standard 3d content creation applications

     Identify and analyze important light types

     Describe how colour can help set tone and mood in lighting

     Define and describe the use of the following terms:
     3 point lighting, key light, fill light, rim light, global illumination, radiosity, fall off, shadows

2.   Demonstrate the ability to use digital lights and light maps for game art assets effectively.

     Potential Elements of the Performance:

     Describe the importance and uses of lights and lighting in video game art

     Describe the importance and uses of light maps in video game art

     Use an industry standard 3d content creation application to generate a 2nd UV channel for light maps

Define and describe the meaning of the following terms:
Light map, UV, resolution, baking, ambient occlusion, shadow map, emissive map, per-vertex lighting, per-pixel lighting

Demonstrate the ability to fully light and light map a 3d game asset in an industry standard 3d content creation application

3.   Design, produce and light 3d game assets using an industry standard 3d game development applications.

       Potential Elements of the Performance:

       Develop and write a lighting plan

       Demonstrate the ability to use all major identified light types in practice

       Demonstrate the ability to integrate and light existing real-time game assets in an industry standard 3d game development application

4.   Demonstrate the ability to effectively compose, light, render, apply light maps and apply and use post process effects to real-time 3d assets inside an industry standard 3d game development application.

       Potential Elements of the Performance:

       Demonstrate the ability to use light maps from within an industry standard game development application

       Demonstrate the ability to bake lighting information from within an industry standard 3d game development application

       Demonstrate the ability to add depth and effect to a game level using post process lighting effects

5.   Render, export, and layout 3d game assets for a portfolio.

       Potential Elements of the Performance:

       Demonstrate the ability to use production proven pipeline techniques to assemble, produce render and export polished final portfolio pieces

       Layout, publish and render a multi-page portfolio document

       Present an initial portfolio and gain feedback for improvement.

Revise and finalize a multi-page portfolio document

III.   TOPICS:
1.   The foundational elements of traditional light theory

2.   The key differences between traditional lights and digital lights pertaining to industry standard 3d content creation and game development applications.

3.   Creative exploration on how colour can help set tone and mood in lighting.

4.   The importance and uses of lights and lighting in video game art.

5.   The key differences and functions between industry standard 3d game development applications and 3d content creation applications pertaining to lighting video game art.

6.   How to effectively render, export and publish polished game art for portfolios.

IV.   RECOMMENDED RESOURCES/TEXTS/MATERIALS:
Suggested reading

Digital Lighting & Rendering 2nd Edition (2006)

Paperback: 432 pages

Publisher: New Riders Press; 2 edition (May 7 2006)

Language: English

ISBN-10: 0321316312

ISBN-13: 978-0321316318

V.   EVALUATION PROCESS/GRADING SYSTEM:
Assignments/Projects = 100% of final grade
Assignments/projects will constitute 100% of the student's final grade in this course. A missing assignment is equivalent to course objectives not achieved which results in an "F" (fail) grade for the assignment/project.

The following semester grades will be assigned to students:

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 – 89%	

B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
S	Satisfactory achievement in field /clinical placement or non-graded subject area.
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

VI.   SPECIAL NOTES:

Attendance:
Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

VII.   COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.