SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

SAULT COLLEGE

COURSE OUTLINE

COURSE TITLE: Lighting/Rendering

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

PROGRAM: Video Game Art

AUTHOR: Jeremy Rayment

DATE: Jan 8/13   **PREVIOUS OUTLINE DATED:** 12W

APPROVED: "Colin Kirkwood"

                                                  Jan. 9/13

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                           DEAN   **DATE**

TOTAL CREDITS: 4

PREREQUISITE(S): VGA303

HOURS/WEEK: 4

I.   COURSE DESCRIPTION:

At the end of this course students will be well versed in 3D lighting solutions with specific focus on learning lighting techniques for a variety of game art tasks. Fundamental topics will include lighting theory, light mapping, baking & rendering, and the application and uses of in-game lights.

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 light and render 3d assets in an industry standard 3d content creation application.

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 effectively light, render and apply light maps to real-time 3d assets using an industry standard 3d content creation application.

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 a basic real-time 3d game level using an industry standard 3d game development application.

Potential Elements of the Performance:

Define and describe the meaning of the following terms:
Lightmass, Spot light, Point light, Directional light, Dominant lights

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 create and use light maps from within an industry standard game development application.

Demonstrate the ability to create and use a second UV channel for light maps 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.

Use colour on lights to add mood and tone.

5.   Design, produce and light an optimized, advanced real-time 3d game level combining an industry standard 3d game development application with 3d content creation application(s) and 2d image editing applications.

Potential Elements of the Performance:

Demonstrate the ability to use production proven pipeline techniques to assemble and produce an optimized, fully lit, interactive game level.

Explore the use of lights to help with user interactions and accessibility.

Present a finished game level to a group of video game artists.

Rationalize the creative/art direction of light choice, placement and function.

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

2.   The key differences between traditional lights and digital lights as it pertains 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 as it pertains to lighting video game art.

6.   The importance of optimization and resource balance on lighting video game art for a variety of game platforms.

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:

DEDUCTIONS – LATES, EXTENSIONS AND FAILS
Lates:
An assignment/project is considered late if it is not submitted at the time and date specified by the instructor. A late assignment/project will automatically be penalized by a 10% deduction. Late assignments/projects will not be accepted one week past their initial due date. Any assignments/projects not submitted within one week of their initial due date will automatically be assigned a fail grade (F).

Extensions:
The instructor may grant extensions for assignment/projects under exceptional circumstances (e.g. death in the family or serious illness). An extension, when offered, will have a mutually agreed upon deadline that does not extend beyond the conclusion of the current semester.

Fail:
A fail grade (F) is assessed to an assignment/project that has not been executed to a minimum satisfactory "D" grade level or in which the directions have not been followed correctly.

Attendance:
Significant learning takes place in the classroom setting through an interactive learning approach; therefore students are expected to attend all classes and inform the instructor of an anticipated absence. Attendance is mandatory for this course to ensure the course requirements and objectives are met.

A total absence of 3 classes for the semester will be tolerated. After 3 absences penalties will take effect, an additional 10% will be deducted from the final grade for this course per class missed.

i.e. 4 classes missed = 10% deduction form final grade
5 classes missed = 20% deduction from final grade

All in class work is based on the instructor's observation and record of the student's performance in the following areas:

-        ability to follow directions set forth by the instructor

-        attitude and conduct - students should be courteous, respectful, teachable, and considerate of the instructor and other students. They should also strive for a creative atmosphere and keep the work place neat.

-        participation in class projects and discussions

-        attendance and handing in work on time

VII.   COURSE OUTLINE ADDENDUM:

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