Syllabus

Winter 2021

Malcolm Kesson

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5:00 PM - 7:30 PM

SCAD®

The University for Creative Careers®

School of Digital Media, Department of Visual Effects, Savannah

VSFX 319 - Programming Models and Shaders I
Section: 02 CRN: 20935

SCAD Mission:

SCAD prepares talented students for creative professions through engaged teaching and learning in a positively oriented university environment.

Course Description:

This course covers intermediate concepts in programming, with an emphasis on understanding the foundations of 3D modeling, lighting and shading, and the use of C/C++ and Pixars RenderMan scene description languages. Students also learn Pixars shading language for rendering special effects. Prerequisite(s): VSFX 210 or ITGM 236 or ANIM 249.

Course Goals: The following course goals articulate the general objectives and purpose of this course:

1. Students will learn the computer science that underpins the operation of modern 3D modeling, animation and rendering applications.
2. Students will be exposed to an industry-standard renderer through class demonstrations and hands-on practice.
3. Students will learn to create and edit shaders to resolve a variety of shading problems commonly encountered in the process of look development.
4. Students will learn how to write and edit 3D scene descriptions.
5. Students will explore the interaction between texture and lighting of real-world objects.

Student Learning Outcomes: The following course outcomes indicate competencies and measurable skills that students develop as a result of completing this course:

1. Students will manipulate named 3D coordinate systems, points, vectors and surface normals to enable a look

development artist to conveniently control surface topology, colors and opacities.
2. Students will successfully manage the technical issues of using a stand-alone renderer with 3D modeling and animation software.
3. Students will create and edit shader source code files in order to generate shaders that can be used effectively by a look development artist to achieve a specific visual effect.
4. Students will use a text editor to prepare and edit scene description files that can be directly and successfully rendered using a stand-alone renderer.
5. Students will synthesize the topological, textural and lighting attributes of a variety of objects in order to replicate them for visual effects.

Schedule of Classes:

Key events including assignments, projects due dates/exam dates:

Pre-quarter assignment	Install the required software http://fundza.com/tishela/vsfx319/required_software.html
Class 1: Tue, January 05, 2021	Topics • plagiarism • establishing a common directory structure • editing, uploading & testing student web pages • configuring the Cutter text editor • bring your popup page made from paper or card to session 2.
Class 2: Thu, January 07, 2021	**Review** the student self images on their portfolio index web pages. RfM Topics • rendering and rerendering (IPR), • light types, • using Pixar's subdiv attribute, • Image Tool ("it") - Save All andHistogram • Complete your popup book model model ready for session 3.
Class 3: Tue, January 12, 2021	**Review** the students popup book models. RfM Topics • create two categories of cameras in Maya MOD_x modelling viewpoints, and DOP_x cinematic viewpoints. • critique the student popup book models • presence maps • linear workflow • occlusion • denoising • Complete the popup book model tech breakdown ready for session 7
Class 4: Thu, January 14, 2021	RfM Topics • archives • custom batch rendering

Class 5: **Tue, January 19, 2021**	Please note change of date due to MLK being observed on Monday 21st January. Topics • finalizing the lighting, • layout and structure of a technical breakdown, • linking images to a web page, • linking MP4 movies to a web page.
Class 6: **Thu, January 21, 2021**	**Review** the current progress of the technical breakdowns of the popup book on the student the web pages. RfM Topics • depth of field • motion blur • Complete the popup book technical breakdown.
Class 7: **Tue, January 26, 2021**	**Final review** of the technical breakdowns for the "Popup Book" assignment. Introduction to the Open Shading Language. • using Cutter to write osl shaders, • compiling an OSL shader, • using an OSL shader as a Pattern with a PxrOSL node in HyperShade The OSL course of study is divided into two sections. In the first section the visual effects produced by an OSL pattern node are derived from **2D** (UV/ST)data. In the second section the effects are based on **3D** data such as surface position, orientation, curvature and surface motion. Complete the st shading exercise ready for review session 11.
Class 8: **Thu, January 28, 2021**	Topics • metadata • using OSL with Maya + RenderMan
Class 9: **Tue, February 02, 2021**	Topics - 2D Noise • developing noise shaders driven by texture space
Class 10: **Thu, February 04, 2021**	Topics - 3D Noise and other effects • developing noise shaders driven by 3D space • 3D space and coordinate system transformations • 3D textures
Class 11: **Tue, February 09, 2021**	**Final Review** the ST displacement assignment. Topics • adding custom primvars using mel/python scripts • Complete Scanning Electron Microscope Imagery (SEM) for session 20

Class 12: **Thu, February 11, 2021**	Topics • primvars and polygon brightness and coloration
Class 13: **Tue, February 16, 2021**	Topics • primvars and polygon face color
Class 14: **Thu, February 18, 2021**	Topics • displacements and color variations by height
Class 15: **Tue, February 23, 2021**	Topics • color variations by "facing ratio"
Class 16: **Thu, February 25, 2021**	Topics • adding attributes for special shading effects
Class 17: **Tue, March 02, 2021**	Topics • 3D color ramps
Class 18: **Thu, March 04, 2021**	Final look-development.
Class 19: **Tue, March 09, 2021**	Preparation of the technical breakdowns.
Class 20: **Thu, March 11, 2021**	**Final Review** the non-photorealist rendering assingment.

Grading Opportunities:

Your overall course grade will be computed according to the following breakdown:

Assignment	Weight
popup book model	5%
popup book technical breakdown	10%
popup book - final	25%
osl: st shading	20%
osl: non photorealism	30%
Non photorealistic technical breakdown	10%
Total Weight	**100 percent**

Grading Standards	Range
Letter grade: **A** = excellent	90 —100 percent
Letter grade: **B** = good	80 — 89 percent
Letter grade: **C** = *	70 — 79 percent
Letter grade: **D** = *	60 — 69 percent
Letter grade: **F** = failing	0 — 59 percent

*Refer to the student handbooks and departmental standards for minimal acceptance for passing grade.

Course Information:

Field Trip(s):

Field Trips will be provided via Blackboard Announcements prior to the 1st Day of Class

Extra Help Session(s):

TBA

University-wide extended learning opportunities

Extended learning opportunities are designed to enrich and expand students' course-based learning experiences. Attend at least three (3) of the following 10 university-wide extended learning opportunities (i.e., Guests & Gusto, Bee Well, SCADextra

and SCADamp workshops, or SCAD signature events) either on-ground or virtually to further explore your discipline, discover new information, and deepen academic engagement.

Academic Skills Workshop Series

Title: Bit by Bit: Skills for Goal-Setting and Strategic Learning(draft)

Blurb: Join this beginner workshop to discuss trusted techniques to help you set manageable goals and more importantly, achieve them.

Week: 2

Day: Wednesday 1/13/21

Time: 5pm

Presenter(s): Ben Barbour

ZOOM Link: https://scad.zoom.us/j/96514400684

Title: Time's On Your Side: Skills for Time Management

Blurb: Improve your time management and self-regulation skills by exploring methods for creating and maintaining a schedule to succeed in class no matter your location.

Week: 4

Day: Friday 1/29/21

Time: 1pm

Presenter(s): Laura Dombroski

ZOOM Link: https://scad.zoom.us/s/91534393984

Title: Noteworthy: Skills for Notetaking and Memorization

Blurb: Discover practical strategies to help you retain information from class, craft more useful notes and better prepare for exams.

Week: 5

Day: Wednesday 2/3/21

Time: 5pm

Presenter(s): Ben Barbour

ZOOM Link: https://scad.zoom.us/j/96514400684

Title: We've Got This: Skills for Collaboration and Group Work

Blurb: Learn how to avoid the common pitfalls of group work as we review techniques for building partnership, managing accountability, communicating and problem-solving as a team.

Week: 7

Day: Friday 2/19/21

Time: 1pm

Presenter(s): Ben Barbour

ZOOM Link: https://scad.zoom.us/j/96514400684

Writing Workshop Series

Title: Creating Strong Research Questions

Blurb: This graduate writing workshop will cover how to write the over-arching thesis statement and connect writing research questions for the methodology section of your thesis.

Week: 2

Day: Friday, Jan. 15

Time: 2pm

Presenter(s): Jennifer Johnson

Title: Personal Statements for Professional Profiles (Professional Writing)

Blurb: Discover the common types of personal statements and discuss compelling ways to tell your story and strike the right tone for your audience in this professional writing workshop.

Week: 5

Day: Friday

Presenter(s): Carrie Nelson

Title: Find Your Voice (Personal and Creative writing)

Blurb: Explore the elements that contribute to voice to discover what makes your writing unique.

Week: 7

Day: Friday

Presenter(s): Carrie Nelson and Laura Dombroski

Title: Common Character Arcs

Week: 8

Day: Wednesday

Time: 7 pm

Presenter(s): Carrie Nelson

Please refer to the grading opportunities section of this syllabus to see how your participation in the above extended learning opportunities and your completion of related assignments contribute to your overall grade for this course.

Additional extended learning opportunities:

KAYA. Exhibition: 'Under_Ursus'

Thursday, Jan 14th 8pm

Susan Zwerman, Author of VES Handbook and Producing Visual Effects, Los Angles, CA

“Producing Visual Effects”

PLEASE RSVP FOR THIS EVENT AT https://forms.gle/jewjCjVqfXuczKu76

Thursday, Jan 28th 8pm

Jennifer McSpadden, Senior Motion Capture at GoodBye Kansas, Los Angeles, CA

“Motion Capture and Virtual Production”

PLEASE RSVP FOR THIS EVENT AT https://forms.gle/jewjCjVqfXuczKu76

Friday, February 5th 7pm

Jeff Cimprich, 3D Artist at Cincinnati Childrens Hospital, Cincinnati, OH

and

Dheeraj Varandani 3D Generalist at iEXCEL, Omaha, NE.

“Using Visual Effects for Medical Visualization”

PLEASE RSVP FOR THIS EVENT AT https://forms.gle/jewjCjVqfXuczKu76

KAYA is a shape-shifting collaboration between New York-based artists and studio colleagues Kerstin Brätsch and Debo Eilers that has unfolded over the past 10 years. SMA

Group Exhibition: 'I Put a Spell On You: On Artist Collaborations'

Organized by guest curators Sam Bardaouil and Till Fellrath I Put a Spell On You surveys 11 distinct models of collective practice. SMA

HELEN FRANKENTHALER. Exhibition: 'Deliberate Risks: Prints by Helen Frankenthaler'

Deliberate Risks presents works recently acquired for the SCAD Museum of Art Permanent Collection by the pioneering Modernist painter and printmaker Helen Frankenthaler. SMA

deFINE ART 2021

SCAD Museum of Art SCAD FASH MUSEUM OF FASHION + FILM. FEBRUARY 23 – 25, 2021. RSVP (https://www.scadmoa.org/visit) Tours are limited to 10

KATE COOPER. Exhibition

Experimental Gallery Animation | Visual Effects | Immersive Reality | Interactive Design | Motion Media Design | Sound Design Using a visual language she terms “hypercapitalism” SMA

EMILY FURR. Exhibition

Alumni Gallery Art History | Gender Studies | Graphic Design | Painting Emily Furrcreates bold painterly representations of industrial structures. SMA

CHRISTTO AND ANDREW. Exhibition

Gallery 109 Photography | Interior Design | Graphic Design | 3D Design Christto & Andrew are an artistic duo based in Doha,

Qatar and Copenhagen, Denmark. SMA

E N G L I S H C O N V E R S A T I O N G R O U P

email write@scad.edu for more info!

W I N T E R W O R K S H O P S & E V E N T S

ACADEMIC RESOURCES

Step by Step: Skills for Setting Goals and Reaching Them

Join this beginner workshop to discuss trusted techniques to set manageable goals and more importantly, achieve them.

Wednesday, Jan. 13 • 5:00 PM • https://scad.zoom.us/j/96514400684

Time's On Your Side: Skills for Time Management

Improve time management and self-regulation skills by exploring methods for creating and maintaining a schedule to succeed in class no matter your location.

Friday, Jan. 29 • 1:00 PM • https://scad.zoom.us/s/91534393984

We've Got This: Skills for Collaboration and Group Work

Learn how to avoid the common pitfalls of group work and explore techniques for building partnership, managing accountability, communicating and problemsolving as a team.

Friday, Feb. 19 • 1 PM • https://scad.zoom.us/j/96514400684

Noteworthy: Skills for Notetaking and Memorization

Discover practical strategies to help you retain information from class, craft more useful notes and better prepare for exams.

Wednesday, Feb. 3 • 5:00 PM • https://scad.zoom.us/j/96514400684

W O R K S H O P S

P E E R T U T O R I N G

W O R K S H O P S

T H E W R I T E R S ' S T U D I O

Writing Strong Research Questions

This graduate writing workshop will cover how to write the over-arching thesis statement and connect writing research

questions for the methodology section of your thesis.

Friday, Jan. 15 • 2:00 PM • https://scad.zoom.us/j/92733400112

Common Character Arcs

This workshop will cover common aspects of positive, negative and flat character arcs, how they connect with your story's structure and influence other narrative elements.

Wednesday, Feb. 24 • 6:00 PM • https://scad.zoom.us/j/96715700437

W E E K L Y W R I T I N G W O R K O U T S

Writing Strong Thesis Statements - Jan. 15

Transitions - Jan. 22

Quoting and Paraphrasing Techniques - Jan. 29

Understanding Communication Styles - Feb. 5

Screenwriting Formatting - Feb. 12

Elements of Style - Feb. 19

Abstracts vs. Introductions - Feb. 26

Poetic Devices - March 5

Fridays • 11:00 AM • https://scad.zoom.us/j/97777048188

These targeted weekly sessions build important skills with activities and examples to make you a more capable, confident writer. Students, faculty and staff are welcome!

Fridays • 9 AM & 2 PM • https://scad.zoom.us/s/93062899183

Join native English speakers and trained tutors online for weekly sessions to strengthen language and communication skills in a fun and relaxed atmosphere.

Registration required via WC Online

email tutor@scad.edu for more info!

Finding Your Voice

Explore the elements that contribute to voice to discover what makes your writing authentic and unique in this interactive creative writing workshop.

Friday, Feb. 19 • 3:00 PM • https://scad.zoom.us/j/94665056325

C R E A T I V E W R I T I N G C O M M U N I T Y

Are you writing a story? Or do you just want to practice your creative writing? Join the Writers' Studio every week

to find resources, get feedback and connect with other

creative writers.

Sundays • 5 PM • https://scad.zoom.us/j/96064570055

Weekly Writing Group

Personal Statements for Professional Profiles

Sunday, Feb. 7 • 3:00 PM • https://scad.zoom.us/j/95083874068

Discover the common types of personal statements and discuss

compelling ways to tell your story and strike the right tone for

your audience in this professional writing workshop.

Other Course Information

Review the "Selected Works" from the winter quarter 2020.

https://sdm.scad.edu/faculty/mkesson/vsfx319/wip/best/best_winter2020/index.html

Course Materials:

Required Text(s):

Computer Graphics through Key Mathematics

Huw Jones

Springer

ISBN 13:9781852334222

Recommended Text(s):

Python Scripting for Maya Artists (on-line)
Chad Vernon
http://www.chadvernon.com/blog/resources/python-scripting-for-maya-artists/

Required Material(s):

Required Software (the following resources are free)

- Maya (Personal Learning Edition is OK)
- RenderManForMaya and RenderManProServer (RfM & RPS)
- Java Runtime Environment (JRE)
- Cutter text editor
- ffmpeg

University Policies:

Academic Integrity:
Under all circumstances, students are expected to be honest in their dealings with faculty, administrative staff and other students.

In class assignments, students must submit work that fairly and accurately reflects their level of accomplishment. Any work that is not a product of the student's own efforts is considered dishonest. Students must not engage in academic dishonesty; doing so can have serious consequences.

Academic dishonesty includes, but is not limited to, the following:
1. Cheating, which includes, but is not limited to, (a) the giving or receiving of any unauthorized assistance in producing assignments or taking quizzes, tests or examinations; (b) dependence on the aid of sources including technology beyond those authorized by the instructor in writing papers, preparing reports, solving problems or carrying out other assignments; (c) the acquisition, without permission, of tests or other academic material belonging to a member of the university faculty or staff; or (d) the use of unauthorized assistance in the preparation of works of art.
2. Plagiarism, which includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. Plagiarism also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.
3. Submission of the same work in two or more classes without prior written approval of the professors of the classes involved.
4. Submission of any work not actually produced by the student submitting the work without full and clear written acknowledgement of the actual author or creator of the work.

Attendance Policy:
Students are expected to actively engage in courses to achieve the required learning outcomes. Absences in excess of 20 percent of the course (e.g., five absences for a 10-week course that meets twice per week) result in the student receiving a failing grade, unless the student withdraws from the course in accordance with the withdrawal policy. Absences due to late registration are included in the overall absences permitted for the course.

For on-ground courses, students are expected to attend and participate in all scheduled class periods. Tardiness, early departure, or other time away from class in excess of 15 minutes per class session is considered an absence for that class session.

Students enrolled in eLearning courses are required to check the online course site regularly and academically engage in the daily work of the course. At minimum, students should log in to the course and participate in academically related activities on two separate days per unit/week.

For students enrolled in real-time virtual courses (i.e., SCADnow), active participation in live lectures is the most beneficial form of academic engagement and the best way to demonstrate attendance. If students are unable to attend live lectures due to time zone or other individual challenges, they should demonstrate academic engagement and attendance by logging in to the course and participating in academically related activities on at least two separate days per unit/week.

SCAD faculty monitor and measure attendance for eLearning and SCADnow by documenting each student's weekly academic engagement. Academic engagement is defined as participating in live lectures, demos, or critiques; posting to discussion forums or blogs; submitting assignments; completing quizzes or examinations; attending extra help sessions, office hours, or midterm conferences; and/or corresponding with professors regarding course content via phone, email, text, etc.

Personal Conduct Policy:
Students' appearance and conduct should be appropriate and contribute to the academic and professional atmosphere of SCAD. Any student whose conduct is detrimental to the academic environment or to the well-being of other students, faculty, staff members, or university facilities will be subject to disciplinary action, up to and including expulsion from the university.

Enrollment policies:
Students are responsible for assuring proper enrollment. See scad.edu for information on add/drop, withdrawals, incompletes, and academic standing.

Midterm Conference(s):
Each student enrolled in the course will have a midterm conference scheduled outside of class time with the professor. Students are expected to keep this appointment.

Academic Support and Tutoring:
Academic support for students at all SCAD locations can be found in MySCAD, under the Student Workspace tab, Department Directory, Academic Resources.

Course Evaluations:
Course evaluations offer students a dedicated opportunity to provide constructive feedback on each of their courses. Student feedback gathered through course evaluations is essential to continuously improving the SCAD academic experience. Evaluations are available to students each quarter during Weeks 8, 9, and 10 through MySCAD. For additional information, contact evaluations@scad.edu.

Student Surveys:
SCAD strongly encourages students to provide feedback on their university experience through institutional surveys. The SCAD Student Survey and the Ruffalo Noel Levitz Student Satisfaction Inventory are administered to students across locations each spring. The National Survey of Student Engagement is administered biennially in winter. Following survey administration, SCAD's institutional effectiveness department analyzes and reports results to various SCAD departments to inform data-driven enhancements. For additional information, contact surveys@scad.edu.