

# Syllabus

Fall 2009

Prof. Malcolm Kesson

Office building, room:

Office phone:

Office hours:

Email: [mkesson@scad.edu](mailto:mkesson@scad.edu)

Building/Room: MONTGO 223

Meeting Times: Monday / Wednesday  
11:00 AM - 1:30 PM

# SCAD®

The University for Creative Careers®

*School of Film, Dig Media, Perf, Department of Visual Effects, Savannah*

## VSMX 319, Section: 01 Programming Models and Shaders I

### **Mission of the College:**

The Savannah College of Art and Design exists to prepare talented students for professional careers, emphasizing learning through individual attention in a positively oriented university environment.

### **Course Description:**

This course covers intermediate concepts in programming, with an emphasis on understanding the foundations of 3-D modeling, lighting and shading, and the use of C/C++ and Pixar's RenderMan scene description languages. Students also learn Pixar's shading language for rendering special effects. Prerequisites: VSMX 210 or ANIM 250.

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

To ensure students gain an understanding of the computer science that underpins the operation of modern 3D modeling and animation applications. In particular students should be able to:

- edit a RenderMan RIB file in order to modify a rendered image,
- compile an existing shader,
- extend a shader by combining its source code with that of another shader,
- implement a shader to achieve a specific visual effect,
- render a short animation of a prop or character using Pixar's prman.

**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 acquire and demonstrate knowledge of the RenderMan Interface.
2. Students will acquire and demonstrate knowledge of the use of mtor and prman for animation.
3. Students will acquire and demonstrate knowledge of the use of RenderMan shaders that manipulate

Named 3D coordinate systems, Points, vectors and surface shading normals, Surface colors and opacity.

## Course Materials:

---

### Required Text(s):

"The RenderMan Shading Language Guide" Cengage Learning  
Rudy Cortes, Saty Raghavachary  
ISBN: 10-1584504323

### Recommended Text(s):

Revised February 2008 Recommended Text(s):  
Rendering for Beginners Saty Raghavachary Focal Press  
ISBN: 0-240-51935-3

Computer Graphics - Mathematical First Steps P.A.Egerton W.S.Hall  
Prentice Hall 0-13-599572-8

### Required Material(s):

A notebook and pen.

## Grading Opportunities:

---

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

No Assignments have been entered

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

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

## Schedule of Classes:

---

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

<b>Class 1:</b>	Class 1 Monday, September 14: Discussion of course objectives and the two types of student assessment, namely, "completion exercises" and "graded projects". Introduction to the RenderMan Graphics System. Introduction to the web-based "work-in-progress" portfolio and use of a template web page.
-----------------	--

<b>Class 2:</b>	Class 2 Wednesday, September 16: Check the student web pages for the completion of the self image exercise. Introduction to the basics of RIB.
<b>Class 3:</b>	Class 3 Monday, September 21: Check the student web pages for the completion of the matrix project. Shaders – light source, surface and displacement.
<b>Class 4:</b>	Class 4 Wednesday, September 23: Application of textures to surfaces and the production of shadow files for casting shadows.
<b>Class 5:</b>	Class 5 Monday, September 28: Check the student web pages for the completion of the lighting project. Archive RIB files and the management of level-of-detail.
<b>Class 6:</b>	Class 6 Wednesday, September 30: Introduction to Pixars RenderMan Studio, attaching shaders, exporting RIB files and attaching a pre-shape MEL script to geometry.
<b>Class 7:</b>	Class 7 Monday, October 5: Studio session devoted to working the level-of-detail assignment. Use of Shake scripts and batch rendering scripts.
<b>Class 8:</b>	Class 8 Wednesday, October 7: Review the level-of-detail assignment. Introduction to the RenderMan Shading Language, texture coordinates, surface normals and viewing vectors.
<b>Class 9:</b>	Class 9 Monday, October 12: Review the st coloration assignment. RSL instance variables, animating parameters.
<b>Class 10:</b>	Class 10 Wednesday, October 14: Writing shaders that produce repeating pattern and the use of the smoothstep function.
<b>Class 11:</b>	Class 11 Monday, October 19: Review of the Maya pattern animation. Maya lighting and SLIM shading networks.
<b>Class 12:</b>	Class 12 Wednesday, October 21: Studio session devoted to working on the Maya lighting assignment.
<b>Class 13:</b>	Class 13 Monday, October 26: Review the Maya lighting assignment. Use of RSL noise function and RenderMan coordinate systems.
<b>Class 14:</b>	Class 14 Wednesday, October 28: Use of color ramps and noise to control opacity.
<b>Class 15:</b>	Class 15 Monday, November 2: Studio session working on the shader animation assignment.
<b>Class 16:</b>	Class 16 Wednesday, November 4: Continue working on the shader animation project.
<b>Class 17:</b>	Class 17 Monday, November 9: Edge effects using the vector dot product. Continue working on the shader animation project.
<b>Class 18:</b>	Class 18 Wednesday, November 11: Designing and implementing a SLIM displacement shader. Continue working on the second part of the shader animation project.

<b>Class 19:</b>	Class 19 Monday, November 16: Review of the shader animation assignment.
<b>Class 20:</b>	Class 20 Wednesday, November 18: Final check of student web pages. Student feedback/appraisal of the course.

### **Course Information:**

---

#### **Field Trip(s):**

Field trips will be scheduled outside of the regular class hours; these will be announced as the quarter progresses.

#### **Extra Help Session(s):**

These will be scheduled on a weekly basis outside of regular class hours.

#### **Other Course Information:**

## **College Policy:**

---

### **Academic Integrity:**

Under all circumstances, students are expected to be honest in their dealings with faculty, administrative staff and fellow 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 college 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 and Personal Conduct:**

Only students who are properly registered for a course may attend that class. Students are expected to participate in all scheduled classes and examination periods. Absences in excess of four per quarter, or 20 percent of the course, result in a failing grade for the course. Tardiness, early departure or other time away from class in excess of 15 minutes is considered absence for the class period.

The student's appearance and conduct should be appropriate and should contribute to the academic and professional atmosphere of the college. The college reserves the right at its sole discretion to withdraw the privilege of enrollment from any student whose conduct is detrimental to the academic environment or to the well-being of other students, faculty or staff members, or to the college facilities.

### **\*Flu-related absences:**

In an effort to reduce the spread of the H1N1 virus, the Savannah College of Art and Design is implementing various protocols suggested for colleges and universities by the Centers for Disease Control and Prevention.

Students who experience flu-like symptoms should not attempt to attend class until 24 hours after symptoms subside. Students who miss class due to the flu virus must contact their professors immediately, before class if possible but within 24 hours of the class meeting to discuss make up options if they are available.

Students should ensure that all absences are used wisely in case they become ill and need to miss class. Students who contract the flu virus may be granted leniency with the attendance policy, but must complete all required course assignments and attain all required learning outcomes. Individual circumstances will be reviewed on a case-by-case basis by the professor.

### **Enrollment policies:**

Students are responsible for assuring proper enrollment. See the college catalog 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.

### **Learning Support Resources and Academic and Safety Polices:**

Information about SCAD learning support resources and academic and safety policies, including the Learning Assistance Center, the Jen Library, the Writing Center, SCAD Helpdesk, the Visual Resources Center, and Student Counseling and Disabilities Services can be found in the menu area of the Blackboard web site for this course.

**Student Surveys:**

The SCAD Student Survey and the Noel-Levitz Student Satisfaction Inventory will both be administered in Week 6 of spring quarter and online course evaluations will be available every quarter during weeks 8-10. SCAD's office of institutional research is responsible for gathering and delivering survey results to decision-makers on campus. For more information or questions, contact us at [surveys@scad.edu](mailto:surveys@scad.edu).

Please refer to the college catalog or the student handbook for all college policies and procedures.