

<b>COURSE NUMBER:</b>	CA3600	<b>PHONE:</b>	
<b>COURSE NAME:</b>	Graphics Programming	<b>EMAIL:</b>	krishna.at.ait@gmail.com
<b>COURSE LENGTH:</b>	11 weeks	<b>TWITTER:</b>	twitter.com/krishna_ait
<b>CONTACT HOURS:</b>	44 hours	<b>OFFICE HOURS:</b>	Meetings by Appointment
<b>CLASSROOM #:</b>	Room #TBA	<b>CREDITS:</b>	4
<b>INSTRUCTOR:</b>	KRISHNA M. SADASIVAM	<b>DATE OF SYLLABUS:</b>	1/1/2010
		<b>WEB:</b>	<a href="http://www.sivamstudios.com/ait">http://www.sivamstudios.com/ait</a>

**COURSE DESCRIPTION:**

This course will lead students through the concepts and the fundamentals of MEL (Maya Embedded Language) and Scripting in Maya. Using Expressions and Mel Commands to control animation and particles which will help enhance student Demo Reels and to add special effects into animation and dynamic simulations.

**PREREQUISITES: CA3500 INTRODUCTION TO SPECIAL EFFECTS**

**STUDENT LEARNING OBJECTIVES /COURSE OBJECTIVES:**

- Understanding MEL and Expression usage in every day work flow.
- Types of commands, variables, flags, functions, MEL procedures and scripts.
- Customize your models, animations, render tasks and dynamics.
- Adding special effects to your animation.
- Explore modeling and animation techniques using Maya

**STUDENT LEARNING OUTCOMES:**

- Upon successful completion of the course the student will be able to:
- Understanding MEL and Expression usage in every day work flow.
  - Types of commands, variables, flags, functions, MEL procedures and scripts.
  - Customize your models, animations, render tasks and dynamics.
  - Adding special effects to your animation.
  - Explore modeling and animation techniques using Maya

**GRADING OPPORTUNITIES:**

**Assessment**

*This is a highly interactive and discussion-oriented course.* Students will learn from one another as well as from the instructor, guest lecturers, the text, readings, exercises, presentations weekly assignments and the final project. Professionalism will be put into practice through the students' promptness, class attendance, willingness to create a forum for shared ideas, quality and creativity of work, and the meeting of deadlines. Specifically, grades will be based on the following criteria:

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|--|------------|
| • <b>*Overall Class Participation:</b> Class preparedness, participation (includes in-class discussions, note taking, having required supplies, Q&A during lectures, readings and presentations). Positively contributing to class | <b>10%</b> |
| • <b>Projects:</b>   | <b>70%</b> |
| • <b>Quizzes:</b>  | <b>20%</b> |

- **Attendance:** Attendance is taken twice throughout class time. It goes without saying being absent from class can have a **substantial** negative effect on your final grade

**STUDENT LEARNING ASSESSMENT:**

<b>CREATIVITY</b>	<b>25%</b>
<b>SYNTAX &amp; STRUCTURE</b>	<b>25%</b>
<b>AESTHETICS</b>	<b>25%</b>
<b>TECHNICAL SPECS</b>	<b>25%</b>

**CLASS ASSIGNMENTS**

Projects

Weekly Quizzes

Final Project

**OVERALL CLASS PARTICIPATION** 10% of your grade

**Grading Criteria:** (i.e. thoroughness, neatness, concept, design, execution, professionalism, presentation, craft, cleanliness, following instructions) applies to all presentations and individual assignments. **Handwritten work, no matter how neat you think it is, is not accepted.** This is college and all work must be typed. Submission of handwritten work will not even be considered and will receive an F (0) for that assignment. Don't even try it.

**Grading Scale:** A= 93-100, A-= 90-92, B+= 87-89, B= 83-86, B-= 80-82, C+= 77-79, C= 73-76, C-= 70-72, D+= 65-69, D= 60-64, F= 0-59

**CLASSROOM POLICIES:**

**Late Work:** Since this course is dealing with industry success, all projects will be due on the date assigned and at the beginning of all classes. **Late work will not be accepted. It will be an F/0.** If schedule problems occur, notify the professor before any and all due dates. Putting the "final touches" on your homework/assignments such as stapling, printing out, mounting, cutting or even putting your name on the assignment, etc., prior to the start of class or during break is considered late (therefore an F/0). Regardless of when the work is collected, it should be 100% complete when you walk into class.

**Attendance:** The Art Institute of Tampa policy requires students to attend a minimum of 82% (36 hours) of scheduled course hours in order to receive a passing grade in a course. Attendance is taken twice throughout the class. If you are just a few minutes late, or walk in when attendance is being taken, it will be marked down as a half (1/2) of absence. *Missing two or more classes (or can result in the failing of this class. I repeat: Missing two or more classes can result in the failing of this class (and your other classes as well).*

**Sleeping in Class:** Sleeping in class is not permitted and will not be tolerated. **If you are falling, or are a sleep, you will simply be asked to leave the class for the day and will be marked absent for the entire day.**

**Email:** Check often, relay the information to your classmates. Ultimately you are responsible for checking email and following up with the instructor if you not receiving assignments, notes and correspondence for the class via email. It is CRITICAL you start the semester off fresh by clearing out your student account and adjust your forwarding address if necessary. I will correspond with the class quite often via email. Again, check often, relay the information to your classmates and ultimately you are responsible for checking your email. **\*\*Let's exchange information now\*\***

**Plagiarism:** Plagiarism will not be tolerated and may lead to immediate expulsion from the class and/or college. Plagiarism

includes taking words, ideas, or artwork from anyone else and presenting it as your own or not citing properly in accordance with APA Style Guide.

**Food/Beverages:** Food and non-sealed beverage containers are NOT permitted in any classroom, lab or studio.

**Cell Phones and other electronic devices:** Cell phone usage is not permitted in any classroom, lab or studio. All cell phones, beepers, games, two-way radios (Nextel), or any other communication device must be turned off before entering the classroom. Leaving the class to take/make a phone call is not permitted unless it is an absolute medical emergency. If you do, **you will be marked absent** for the entire day. If I see you sending text messages, IMing or playing games or doing anything with any phone or electronic device **you will be told to leave the class for the remainder of the day and you will be marked absent** for the entire day. Leaving devices in silent or vibrate mode is not permitted and text messaging during class is not allowed. **In other words, turn all devices completely off and forget you even have them with you for just a few hours. Please take a moment to shut everything off now.**

**Add/Drop:** The first six (6) academic days (not including Saturdays, Sundays and holidays) of each quarter are designated as the schedule adjustment period. During this time, students may make registration adjustments (adding, dropping, or changing days/times of courses) without financial penalty.

**Holidays:** This quarter has one holiday, on Week 8 so PLAN AND SCHEDULE AHEAD OF TIME. **Not handing in work or having to leave early for the holiday prior to the end of the quarter are not acceptable excuses.**

**Required Text(s):**

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**Recommended Text(s):**

- Maya 7: Visual QuickStart Guide, Riddell, Robinson and Stein. ISBN: 0-321-34899-0
- Learning Maya 5: MEL Fundamentals, Alias. ISBN: 1-894893-44-1
- The Art of Maya

**Required Supplies:**

- USB Flash Drive (1GB)
- CD-Rs / DVD-Rs (Data back-up, assignment submission)
- DVD disc and disc jacket
- Writing Utensil of Choice
- Lots of loose-leaf paper

**Recommended Supplies:**

- An open mind

**ADA Statement:** To meet the needs of our students with disabilities, The Art Institute offers reasonable accommodations for qualified students with disabilities. Students or applicants who would like to request reasonable accommodations should contact the Student Services Coordinator for the school. Students with disabilities are encouraged to contact your instructor and the Dean of Student Affairs in advance of the quarter of study when accommodations are needed.

**Saving Work:** It is the student's responsibility to save his or her work to disk. Multiple copies should be saved and verified prior to leaving the classroom. The teacher is in no way responsible for the work saved on hard drives, nor is he/she bound to give an extension on work improperly saved. The hard drives will get purged regularly. **Students are expected to back up all work. Loss, theft, computer failure, etc. are not acceptable excuses.**

**PARTICIPATION CRITERIA**

- ▲ Excellent
- A (93-100)
- A- (90-92)

**Outstanding participation.** The student is actively engaged in every facet of the class. He/She comes to every class session ready to engage in informed discussion bases on a thorough and critical reading of their homework assigned material (if applicable), and he/she maintains complete critical reading notes and brings it to every class session and keeps copies of everything in their journal. The student makes extraordinary contribution to the class through consistently thoughtful, well focused, and original examples. The student works collaboratively with his/her classmates and instructor and the student seeks assistance should he/she need it. **The student misses no classes.**

#### **Very Good/Good**

**B+ (87-89)**

**B (83-86)**

**B- (80-82)**

**Good participation.** The student is actively engaged in most facets of the class. He/She comes to every class session ready to engage in informed discussion based on a careful reading of the assigned material, and he/she maintains substantial number of critical reading notes and brings it to most class sessions. The student makes a solid contribution to the class through regular relevant and thoughtful comments, questions and examples. The student works collaboratively with his/her classmates and instructor and the student is likely to seek assistance should he/she need it. The student misses the maximum of **one** class.

#### **Satisfactory**

**C+ (77-79)**

**C (73-76)**

**C- (70-72)**

**Average participation.** The student is actively engaged in some facet of the class. He/She comes to many class sessions ready to engage in informed discussion based on a general reading of the assigned material, including few critical reading notes and brings it to many class sessions. The student makes a contribution to the class through general, incomplete and/or tangential comments. The student, for the most part, works collaboratively with his/her classmates and instructor and is not likely to seek assistance on his/her own. The student misses **two** class sessions.

#### **Below Average**

**D (60-64)**

**Poor participation.** The student rarely demonstrated an active engagement in some facets of the class. He/She comes to many class sessions unprepared for informed discussion, and his/her critical reading notes are substantially incomplete and rarely bring it to the class sessions. The student does not collaborate with his/her classmates and instructor and the student is not likely to seek assistance on his/her own or even with direction. The student misses two-three class sessions.

#### **Failure**

**F (0-59)**

**Unacceptable participation.** The student is not an active member of the class.

Syllabus Changes: **Syllabus is subject to change at the instructor's discretion. Awareness of these changes is the student's responsibility**

## **CLASS SCHEDULE:**

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### **Week 1:**

#### **Topics:**

- Introductions
- A Brief History of Maya
- Node Based architecture and why its important
- Maya vs. 3D Studio Max
- MEL Scripting: What it is
- Exploring the Maya UI (including Customizing)
- Review: NURBS vs. Polys vs. Sub-D surfaces
- Basic modeling techniques (node naming, transforming objects, and the hypergraph)
- Basic Camera and Lighting
- Duplicating objects
- Mirroring and Instancing Objects
- Multiplicity Assignment
- Basic rendering techniques

#### **Week 1 Goal:**

- Understand the history of Maya, its usage and its importance in the arena of 3D modeling and animation
- Understanding the role of MEL scripting in Maya
- Basic competency in navigating and customizing the Maya UI, polygon modeling, creating lights and cameras

#### **In-Class Assignment:**

- Demo - Maya UI and basic polygonal modeling
- Demo - camera creation, lighting a scene

#### **Assignment Due Next Week:**

- Multiplicity assignment
- Visit [autodesk.com](http://autodesk.com) and download Maya PLE for your machine at home (if applicable)

#### **Handouts:**

- Syllabus available online, as are all assignments

## **Week 2:**

### **Topics:**

- Grouping, parenting, and aligning
- Transforming groups
- Groups vs. parenting
- The 4 Snaps (Grids, Curves, Points, View Planes)
- Aligning
- NURBS curves and surfaces
- Anatomy of a Curve
- EP vs CV tool in creating NURBS curves
- Interactions between Curves
- Creating Surfaces from Curves
- Extruding a Curve and Birail surfaces
- Attaching and Filleting
- Working with Polygons
- Extruding Faces from sides and vertices
- Deleting edges, splitting faces

### **Week 2 Goal:**

- Become comfortable with NURBs modeling
- Know when to use NURBS and when to use Polys
- Be able to manipulate NURBS surfaces using the techniques listed above

### **Due Today:**

- Quiz 1
- Multiplicity Project (in dropoff box)

### **In-class Assignment:**

- class critique of Multiplicity project
- Demo - more NURBS modeling
- Demo - more polygon modeling

### **Assignment Due Next Week:**

- Modeling Project work-in-progress

### **Handouts:**

- Modeling Project
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### **Week 3:**

#### **Topics:**

- Smoothing Polys
- Adding an image to a plane
- Back-face culling
- Subdividing and merging
- Smooth proxy modeling
- Displaying vertex normals
- Removing corners and holes
- Nonlinear Deformers, Lattices, Clusters, Oh my!
- Filling a hole in a polygonal object
- Cameras and Rendering

#### **Week 3 Goal:**

- Continue to develop proficiency in polygonal and NURBs modeling
- Develop an understanding of camera treatment
- Understand the nuances of rendering using Maya

#### **Due Today:**

- Quiz 2.
- Modeling Project work-in-progress (concept sketches, rough treatment of scene, references)

#### **In-class Assignment:**

- Demo (above)
- Work in class (one-on-one help)

#### **Assignment Due Next Week:**

- Modeling Project

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### **Week 4:**

#### **Topics:**

- Basic Animation in Maya
- Setting and editing keyframes in the Timeline
- Setting Animation Preferences
- Using the Graph editor
- Adjusting keyframes in the Graph editor

- Animating along a path
- Creating a Playblast
- What the Heck is a Deformer?
- Nonlinear deformers

**Week 4 Goal:**

- Develop familiarity with Maya's animation controls, including the timeline and Graph Editor
- Develop an understanding of deformers and how to apply them to various surfaces and volumes

**Due Today:**

- Quiz 3
- Modeling Project / Class Critique

**In-Class Assignment:**

- Demo (above)
- Hands-on Practice with Animating and Keyframing

**Assignment Due Next Week:**

- Animated 3D Logo project due
- Research Project Outline, Area of Research and Models

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**Week 5:**

**Topics:**

- A formalized introduction into MEL scripting
- Exploring the Maya command set
- Macros vs. Scripts
- Customizing Maya with MEL
- Shelf Buttons, marking menus, hotkeys
- Accessing the MEL documentation
- Adding custom Hotkeys
- Creating Marking Menus

**In-class assignment:**

- DEMO - Script Editor, Adding Custom Shelf Buttons to execute Menu Item

- DEMO – Adding a Shelf Button to execute a MEL Script
- DEMO – Adding a Shelf Button that executes multiple MEL commands
- DEMO –Editing Shelf Buttons (Changing icons and label of shelf button)
- DEMO - Adding custom Hotkeys
- DEMO - Creating Marking Menus

**Due Today:**

- Quiz 4
- Animated Project Due

**Assignment Due Next Week:**

- GUI Project Due

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**Week 6:**

**Topics:**

- All About Attributes
- The Attribute Editor
- Using MEL to access attributes
- Connecting and Disconnecting Attributes
- Adding Custom Attributes
- Using Expressions

**In-class assignment:**

- DEMO – Making Attributes

**Due Today:**

- Quiz 5
- GUI Project Due

**Assignment Due Next Week:**

- Attributes and Expressions Project Due

## **Week 7:**

### **Topics:**

- MEL Command and Syntax Structure
- Creating, Querying, Editing and Deleting Custom UI elements
- Creating Sliders
- Multiple Layouts and The setParent Command
- What the Heck is a Variable?
- Operator Precedence
- Array Variables
- Conditional Statements

### **In-class assignment:**

- DEMO: My First MEL Created Window
- DEMO: Create Several Windows
- DEMO: Variables and Operator Precedence
- DEMO: Conditional Ball
- DEMO: Splatter Balls
- DEMO: AutoUI

### **Due Today:**

- Quiz 6
- Attributes and Expressions Project Due.

### **Assignment Due Next Week:**

- GUI Control Project due.
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## **Week 8:**

### **Assignment Due Week 9:**

- Conditional Statement Project due (integrate procedures)
- **In-class studio time / help**

**Week 9:**

**Topics:**

- Fun With Loops
- The 'For' Loop
- The 'For-In' Loop Rework old projects
- Studio Time

**In-class Assignment:**

- Studio Time

**Due Today:**

- Conditional Statement Project Due

**Due Next Week:**

- For Loops Project
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**Week 10:**

**Topics:**

- Final Exam review

**Due Today**

- For Loop Project Due (integrate procedures)
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**Week 11:**

- FINAL EXAM  
**Congratulations! You've survived Graphics Programming!**

**COURSE NUMBER:** CA3600  
**COURSE NAME:** Graphic Programming  
**INSTRUCTOR:** Krishna M. Sadasivam

- I have completely read and fully understand the contents of this syllabus
- I take full responsibility for living up to these obligations including, but not limited to attendance, participation, notes, quizzes, projects, etc.
- I will ask for help/assistance (both in and out of class) if needed.
- It is my responsibility to check the website ( <http://www.sivamstudios.com/ait> ) if I am unable to attend class. I furthermore understand that I am responsible for all work assigned on the day its due.
- I will go in with an open mind and give this course my best effort.

Student Signature: \_\_\_\_\_ Instructor Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_ Print Name: **Krishna M. Sadasivam**

Date: \_\_\_\_\_ Date: \_\_\_\_\_

Print, sign and return this sheet at the beginning of class Week 2 to receive **20 points of Extra Credit.**