COLEMAN UNIVERSITY

San Diego, CA San Marcos, CA

Course Syllabus

COM403: Advanced DirectX

COURSE DESCRIPTION

This course enables the students to apply Direct3D to implement a variety of interesting techniques and special effects. The students will learn and implement techniques such as working with meshes, terrain rendering, picking, particle systems, environment mapping, normal mapping, shadows, and rendering to textures.

GENERAL COURSE INFORMATION

Number of Units / Weeks	4/10
# Hours Lecture / # Hours Laboratory / # Hours Homework	30/20/60
Prerequisite(s)	COM 283
Course Developer(s)	Sowmya Ganore MS, MCA
Date Approved / Last Review	February 2011 / August 2014

LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

- Learn and discover creating and using cube maps and model reflections, and apply textures.
- Understand how to store and create normal mapping, determine its coordinate systems, identify how the object space relates to a 3D triangle and Implement normal mapping in a vertex and pixel shader.
- Understand the basic shadow mapping algorithm and know how to render and project textures and orthographic projections.
- Learn how to use the ID3DX10Mesh interface for storing and rendering mesh data to create, optimize, and render an ID3DXMesh object and to load data from file into an ID3DX10Mesh instance. Understand several D3DX mesh-related utility functions.
- Determine the 3D object and enable picking the object with the mouse cursor
- Understand terrain rendering wherein they will learn about adjusting the vertices of mesh models to enable smooth transitions thereby simulating a terrain and apply various textures to the landscape

- Learn how to store and render particles efficiently using the geometry shader and stream output functionality, enable the particles to move in a physically realistic way using basic physics concepts and design a flexible particle system framework that makes it easy to create new custom particle systems.

INSTRUCTIONAL METHODS EMPLOYED IN THIS COURSE

A number of instructional/learning methods are employed in this course, including the following:

- Lecture and Reading Assignments
- Hands-on Exercises and Labs
- Practical application of theory and skills in authentic Programming Projects
- Build on prior knowledge and experience of students to enhance richness of class activities

INFORMATION RESOURCES FOR THIS COURSE

Textbook

Luna, Frank D. Introduction to 3D Game Programming with DirectX10. Wordware Publishing, Inc. 2008. ISBN: 978-1-59822-053-7.

Other Materials

Coleman College. The College Writer's Guide. San Diego: Coleman College, 2009.

Microsoft Visual Studio
http://www.microsoft.com/visualstudio/en-us/
Retrieved April 7, 2010

Web Site Readings

N/A

COURSE OUTLINE

WEEK	*TOPIC*	*READING*	*PROJECT ASSIGNED*
1	Introduction to Directx		**Research:** Paper I 5 hours **Evaluation:** graded, 7 points **Research:** Paper II 5 hours **Evaluation:** graded, 7 points
2	Cube Mapping	Chapter 11	**Read:** Chapter 11 14 pages, 1.4 hours **Discussion Questions**: Chapter 11 10 questions: 0.7 hours **Evaluation**: graded, 2 points **Project** 1 8 Hours **Evaluation**: graded, 5 points
3	Normal Mapping.	Chapter 12	**Read:** Chapter 12 11 pages, 1.1 hours **Discussion Questions**: Chapter 12, 10 questions: 0.7 hours **Evaluation**: graded, 2 points **Project** 2 8 Hours **Evaluation**: graded, 5 points

WEEK	***TOPIC***	***READING***	***PROJECT ASSIGNED***
4	Shadow Mapping	Chapter 13	**Read:** Chapter 13 24 pages, 2.4 hours **Discussion Questions**: Chapter 13, 15 questions: 1.0 hours **Evaluation**: graded, 3 points **Project** 3 20 Hours **Evaluation**: graded, 15 points
5	Shadow Mapping continued **Mid Term**	Chapter 13	
6	Meshes	Chapter 14	**Read:** Chapter 14 15 pages, 1.5 hours **Discussion Questions**: Chapter 14 10 questions: 0.7 hours **Evaluation**: graded, 2 points **Project** 4 4 Hours **Evaluation**: graded, 3 points
7	Picking	Chapter 15	**Read:** Chapter 15 12 pages, 1.2 hours **Discussion Questions**: Chapter 15, 10 questions: 0.7 hours **Evaluation**: graded, 2 points **Project** 5 8 Hours **Evaluation**: graded, 5 points

WEEK	*TOPIC*	*READING*	*PROJECT ASSIGNED*
8	Terrain Rendering	Chapter 16	**Read:** Chapter 12 16 pages, 1.6 hours **Discussion Questions**: Chapter 16, 10 questions: 0.7 hours **Evaluation**: graded, 2 points **Project** 6 4 Hours **Evaluation**: graded, 3 points
9	Particle Systems and Stream Output	Chapter 17	**Read:** Chapter 17 28 pages, 2.8 hours **Discussion Questions**: Chapter 17, 10 questions: 0.7 hours **Evaluation**: graded, 2 points **Project** 7 8 Hours **Evaluation**: graded, 5 points
10	Course Wrap-Up		Final Exam

Total hours of required reading: 12 hours
Total hours of chapter/discussion questions: 5.2 hours
Total hours of programs: 70hours – 20 hours = 50 hours
Total hours of out of class activities: 67.2 hours

Your Grades for this Course

Your final grade for this course will be based on an assessment by the Instructor of your performance on a number of course activities, which may include objective tests, classroom exercises, laboratory demonstrations, project papers, or other types of activities. The chart below indicates in what activities you will engage, how many possible points can be earned for each activity, and the percentage of your final grade that will be accounted for by each activity.

Students in this course should be graded following Coleman University assessment practices and policies. A point system is used in the University to indicate student performance on various required activities or projects. For this course, it is recommended that points be distributed as follows:

Coleman University Grade Assignment Policy:

Percent	Letter Grade	Grade Points
94-100	A	4
90-93	A-	3.67
87-89	B+	3.33
84-86	B	3
80-83	B-	2.67
77-79	C+	2.33
74-76	C	2
70-73	C-	1.67
67-69	D+	1.33
64-66	D	1
60-63	D-	0.67
N/A	INC	0
N/A	W	0
60 or above	CR	0
59 or below	NC	0
N/A	I	0
N/A	W	0
N/A	AU	0
N/A	TR	0
N/A	WV	0

Legend	
CR = Credit	NC = No Credit

I = Incomplete	W = Course Withdrawal
AU = Audit	TR = Transfer Credit
WV = Waiver	

Academic Accommodation / Adjustment Policy:

In accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA), Coleman University offers accommodations to students with documented physical, psychological, and/or cognitive disabilities. Coleman University will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to offer equal educational opportunities to qualified disabled individuals.

To qualify for an academic accommodation under ADA, the student must provide adequate documentation of a disability. Students seeking academic accommodations should contact the campus ADA Coordinator at 858-966-3953 or via email at ada@coleman.edu. The ADA Coordinator will review the documentation provided and verify ADA coverage. Students covered under ADA must meet with the ADA Coordinator at the beginning of every term to determine the appropriate academic accommodations. Failing to meet with the ADA Coordinator at the beginning of every term may impact the availability of accommodations.

After the academic accommodations have been determined, the students' instructors will be notified by the ADA Coordinator. If any problems or concerns regarding the provision of accommodations occur, the student must inform the ADA Coordinator. If the student feels accommodation is not being made appropriately, the student may follow the published Student Grievance Procedures.