GMSD 4300.001 Topics in Game Design
3D Materials and Lighting

Instructor: Cory Haltinner

University Of North Texas

Location:

RTFP room 180Y

Days: Monday/Wednesday

Time: 10:00 am - 11:20 am

Instructor:

Cory Haltinner

Cory.Haltinner@unt.edu

Office Hours:
Mondays 1130 am -1:30 pm
RTFP Room 225. Can meet with me before or after class as needed, or other times by appointment.
Class will be notified via canvas of changes or updates to office hours times, or online office hours.

Course Description:

This course is designed to build on the foundations of game art knowledge gained in MRTS 2300 - Digital Asset Creation and Animation course. Students will learn different tools, texturing techniques and optimization strategies used in the gaming industry including PBR materials, hand-painted techniques, gradient mapping, trim sheets, optimization for games, and other aspects of game art asset creation. All assets will be created for use in game engines, focusing on proper optimization techniques.

Learning Outcomes:

- Build upon the game art knowledge gained in the prerequisite Digital Asset Creation and Animation course.
- Ability to create textures and materials in a wide variety of styles and techniques used throughout the gaming industry.
- Understand how various elements are used to optimize game ready models.
- Utilize industry standard techniques to create game ready assets.

- Critically evaluate design choices, optimization strategies, and aesthetics in 3D graphics, gaining insight into decision-making processes.

Communication Practices:

Connect with me through email and/or by attending office hours. During busy times, my inbox becomes rather full, so if you contact me and do not receive a response within two business days, please send a follow up email. A gentle nudge is always appreciated.

Attendance Policy:

Because this course involves collaboration, participation is essential to learning. Our project-based activities require you to be actively engaged in discussions and group work. I understand tardiness and absences may occur. If you are late to class, please drop me an email to let me know the circumstances.

If you must miss class, please let me know prior to your absence. Attendance will count towards a student's final grade, accounting for 20% of the overall final grade.

Late Work Policy:
Late work may be turned in for most assignments and will be accepted unless otherwise stated, however there will be a penalty assessed as follows. 10% will be deducted for every week that the assignment is late, to a maximum penalty of 30%.

- Please note that late work **will not** be accepted for the "Progress Update" turn-ins for projects. Those need to be turned in on time to receive feedback in a timely manner.
- Accommodations will be made in accordance to Title IX, University observed holidays, approved absences, sicknesses, etc. Please communicate with me if and when accommodations are needed.

Examples: an assignment turned in 1-7 days late will be assessed a 10% point deduction
an assignment turned in 8-14 days late will be assessed a 20% point deduction
an assignment turned in 15+ days late will be assessed a maximum 30% point deduction

- This means that an assignment which has been turned in 15+ days late will receive a **maximum** score of 70%.
- I do allow for resubmissions of work that have been turned in on time if the student wishes to address feedback on their projects and resubmit.

Evaluation Methods and Criteria Methods: Students will be graded on quality of presentations, papers, production and public critiques as well as attendance and participation in the course.

Grade Scale:
90+ = A
80-89 = B
70-79 = C
60-60 = D
59-0 = F

Suggested texts (not required):
1. Williams, R "The Animator's Survival Kit" -- Faber & Faber, 2002, ISBN: 0571202284
2. Murdock, K "Autodesk Maya 2024 Basic Guide" -- SDC Publications, 2023 ISBN: 1630575801
3. Johnston, O Thomas, F "Illusion of Life: Disney Animation" -- Hyperion, 1995 ISBN 0-7868-6070-7
4. Gurney, J "Color and Light: A Guide for the Realistic Painter" –- Andrews McMeel Publishing, 2010 ISBN: 9780740797712

Required Software:
Autodesk Maya: Free student version available on Autodesk website

Links to an external site.

Adobe Creative Suite: https://www.adobe.com/creativecloud/buy/students.html

Links to an external site.

Discounted for students
Adobe Photoshop
Adobe Substance Painter
Adobe Substance Designer
Unreal Engine: Free through Epic Game Store
https://dev.epicgames.com/documentation/en-us/unreal-engine/install-unreal-engine

Optional Not Required Software: Free for one year

3D Coat -- https://3dcoat.com/
Zbrush -- https://www.maxon.net/en/zbrush

Assignments and Projects:
Lab Activities: Weekly in class activities using tools and software discussed and demonstrated in class and through readings.

Project 1 - (Squirt Gun) Model, UV and texture a low-poly Squirt Gun using the provided concept art. Students will select a concept from a provided list. This project will focus on low poly optimized modelling techniques, and utilize gradient textures as demonstrated in class.
Project 2 - (Prop Asset) Students will select an asset from a list of provided concepts to create in 3d. This project simulates being a prop artist in industry, taking a concept all the way from model to in engine. Students will utilize hand painted textures to attempt to match style and integrate their prop into a scene from a game.
Project 3 - (Diorama Environment) A small 3d modeled and textured scene with organic foliage, props, and/or buildings. Final renders will be created in Unreal Engine. This project will use everything learned through the semester to create a final portfolio piece.

Final Grade Formula:
Attendance - **20%,**
Speed Practice Activities - **20%,**
Project 1 - Squirt Gun **20%,**
Project 2 - Prop Asset **20%,**
Project 3 - Diorama Environment **20%**

Weekly Class Schedule:

Schedule is subject to change based on student needs, guest speakers and needs that arise. Students will be notified of changes.

Other Relevant and Important Information:

Acceptable and Unacceptable Use of AI:

Generative AI tools (e.g. ChatGPT, Dall-e, etc.) are permitted to be used in this course under specific circumstances:

- They can be used to fuel your creative process as sources for potential ideas, approaches, or solutions, however, they CANNOT be used to directly create any portion of the end-product that you turn in for any assignment.
    - For example, you **cannot**:

        - Use AI to generate your responses to a Worksheet or discussion board post.
        - Use AI to summarize assigned Videos rather than watching them.
    - However, you **can**:
        - Use AI as a resource
        - Use AI to ideate and generate possibilities that feed into your personal creative process.
        - Use AI to generate reference images for your Mood Board.

Simply put, you can use AI as part of the process to produce *your own* creations (posts, documentation, concepts), but you cannot use it to replace your own creations or as a substitute for your own final work product.

Additionally, if you use AI tools:

- You are responsible for the information you submit based on an AI query (for instance, that it does not violate intellectual property laws, or contain misinformation or unethical content).
- Any usage of AI tools must be clearly disclosed (along with a note about the scope and purpose of its usage) in order to stay within university policies on academic honesty.
- Any assignment that is found to have used generative AI tools in unauthorized ways or to generate the final submission for any assignment will result in a penalty on that assignment.
- When in doubt about permitted usage, please ask for clarification.

Inclusion Statement:

I value the many perspectives students bring to our campus. Please work with me to create a classroom culture of open communication, mutual respect, and belonging. All discussions should be respectful and civil. Although disagreements and debates are encouraged, personal attacks are unacceptable. Together, we can ensure a safe and welcoming classroom for all. If you ever feel like this is not the case, please stop by my office and let me know. We are all learning together.

ADA Statement:

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the

ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time; however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the Office of Disability Access

Links to an external site.

website (http://www.unt.edu/oda

Links to an external site.

). You may also contact ODA by phone at (940) 565-4323.

Week #1

Monday 1/12: Intro to Class

- Intro to the Class
    - Professor/Student Introductions
    - Syllabus Review
- Speed Activity - Model a Companion Cube
    - Save your cubes somewhere safe! You'll need them again in week 12!
        - **Due End of Class:** Speed Practice - Companion Cube
        - **HW:** None

Wednesday 1/14: Knocking off the Winter rust

- Continue knocking rust off our Maya skills
- Speed Activity - Hamburger Texture

    - **Due End of Class:** Hamburger Activity Screenshot
    - **HW:** None

Week #2

Monday 1/19: No Class - MLK Day

Wednesday 1/21: Introduce Project 1 - Squirt Gun

- Squirt Gun - Gradient texturing demo
- Select Concept you will work from.
    - **Due End of Class:** Squirt Gun Demo Screenshot
    - **HW:** Concept Selection - Due 1/26
      Work on Project 1 - Due 2/9

Week #3

Monday 1/26: Pixel Art + 3d Models

- Review Concepts chosen for Project 1
  Speed Activity - Minecraft Skin
    - **Due End of Class:** Minecraft Skin Screenshot
    - **HW:** Work on Project 1 - Due 2/9

Wednesday 1/28: Open Lab - Project 1

- **Due End of Class:** Project 1 Progress Update #1
- **HW:** Work on Project 1 - Due 2/9

Week #4

- **Monday 2/2: Photoshop Painting**
- Painting textures in Photoshop
- Material Painting Speed Activity #1

- **Due End of Class:** Material Painting Speed Activity #1
- **HW:** Work on Project 1 - Due 2/9

Wednesday 2/4: Open Lab - Project 1

- **Due End of Class:** Project 1 Progress Update #2
- **HW: Turn in Project 1 *before* class on 2/9**

Week #5

Monday 2/9: Project 1 Due!

- Project 1 Showcase
- Introduce Project 2
    - **HW:** Concept Selection for Project 2 - Due 2/11

Wednesday 2/11: Material Painting with Gradient Maps

- Gradient maps demo for painting textures
- Speed Paint Activity with Gradient Maps
    - **Due End of Class:** Material Paint #2
    - **HW:** Work on Project 1 - Due 2/9

Week #6

Monday 2/16: Texturing with Gradient Maps

- Gradient Map demo with provided asset
    - **Due End of Class:** Textured Prop Screenshot
    - **HW:** Work on Project 1 - Due 2/9

Wednesday 2/18: Open Lab - Project 2

- Open lab to work on your Project 2
    - **Due End of Class:** Project 2 Progress Update #1
    - **HW:** Work on Project 2 - Due 3/4

Week #7

Monday 2/23: Tiling Textures

- Painting Tiling Textures
- Speed Activity painting a brick texture
    - **Due End of Class:** Speed Activity, painting a brick texture
    - **HW:** Work on Project 2 - Due 3/4

Wednesday 2/25: Open Lab - Project 2

- Open lab to work on your Project 2
    - **Due End of Class:** Project 2 Progress Update #2
    - **HW:** Work on Project 2 - Due 3/4

Week #8

Monday 3/2: Normals

- Lecture on Normals, Normal Editing
- Efficient Foliage
- Foliage making activity
    - **Due End of Class:** Screenshot of the plant you made
    - **HW: Turn in Project 2 *before* class on 3/4**

Wednesday 3/4: Project 2 Due!

- Project 2 Showcase
- Introduce Project 3
    - **HW:** Enjoy your Spring Break - Due 3/16

Week #9 SPRING BREAK - NO CLASS

Week #10

Monday 3/16: Introduce Project 3 (Final Project)

- Open lab to work on your Project 3 - grab references
    - **HW:** References for Project 3 - Due 3/18
      Work on Project 3 - Due 4/29

Wednesday 3/18: Trim Sheets

- Demo on creating Trim Sheets in Photoshop
- Activity: create a trim sheet
    - **Due End of Class:** Painted Trim Sheet
    - **HW:** Work on Project 3 - Due 4/29

Week #11

Monday 3/23: Trim Sheets Continued

- Demo on using Trim Sheets in Maya
- Activity: use your trim sheet to texture a small provided scene
    - **Due End of Class:** Screenshot of finished Trim Sheet scene
    - **HW:** Work on Project 3 - Due 4/29

Wednesday 3/25: Open Lab - Project 3

- Open lab to work on your Project 3
    - **Due End of Class:** Project 3 Progress Update #1
    - **HW:** Work on Project 3 - Due 4/29

Week #12

Monday 3/30: Substance Painter

- Demo Substance Painter
    - Activity: Bake and Paint your Companion Cubes from Week 1
        - **Due End of Class:** Screenshot of finished Companion Cube in Substance
        - **HW:** Work on Project 3 - Due 4/29

Wednesday 4/1: Substance Painter Continued

- Demo Substance Painter
    - Activity: "Meet Mat" challenge
        - **Due End of Class:** Screenshot of finished Meet Mat character
        - **HW:** Work on Project 3 - Due 4/29

Week #13

Monday 4/6: Substance Designer

- Demo Substance Designer
    - Activity: Make a tiling texture together as a class
        - **Due End of Class:** Screenshot of Substance Designer texture
        - **HW:** Work on Project 3 - Due 4/29

Wednesday 4/8: Open Lab - Project 3

- Open lab to work on your Project 3
    - **Due End of Class:** Project 3 Progress Update #2
    - **HW:** Work on Project 3 - Due 4/29

Week #14

Monday 4/13: Material Painting #3

- Painting textures
- Speed Paint Activity paint a third type of material
    - **Due End of Class:** Material Paint #3
    - **HW:** Work on Project 3 - Due 4/29

Wednesday 4/15: Open Lab - Project 3

- Open lab to work on your Project 3
    - **Due End of Class:** Project 3 Progress Update #3
    - **HW:** Work on Project 3 - Due 4/29

Week #15

Monday 4/20: Revisiting a Speed Challenge

- Lets see how much you've progressed from MRTS 2300!
    - Redoing the Splash Damage Environment Art Challenge
        - **Due End of Class:** Splash Damage Environment Art Challenge
        - **HW:** Work on Project 3 - Due 4/29

Wednesday 4/22: One on One check-in with Professor

- **I'll meet with each of you 1 on 1 to check progress, answer questions**
    - **HW:** Work on Project 3 - Due 4/29

Week #16

Monday 4/27: Open Lab - Wrap up Project 3

- Open lab to work on your Project 3
    - **HW: Turn in Project 3 *before* class on 4/29**

Wednesday 4/29: Project 3 Due - Turn-in before class

- Project 3 Showcase
    - **HW:** Have a great Summer!