

GAME 220 : ENVIRONMENTAL MODELING

Section 501, CRN 30733, Summer 2023

Instructor: Ian Burch

E-Mail: ianburch@unm.edu

Office and Hours: In-person TBD. Online on Zoom & Learn, Wednesday, 1:00 - 3:00 or by appointment. Link to be posted in Canvas

Division Chair: Dr Stephen Takach; set@unm.edu

Course Prerequisites:

Intro to 3D Modeling (GAME 120) OR Game Engines (GAME 102)

Course Goals:

This course explores what is necessary to build a full 3D game environment, including modeling, texturing, baking, lighting, and construction. Students will learn how to sculpt, texture, and map landscapes in Unreal Engine. For interiors, the class will build a kit-based level framework in Blender; making modular components which can be assembled into a level. Much of the technical focus will be on making efficient and performant scenes, using baked maps, level of detail, and procedural texturing.

Materials:

- Internet Access, for Canvas, Zoom, and Youtube.
- Unreal Engine 5.0 or higher (5.1 recommended)
- Blender (3.0 or higher)

This course requires a computer. If you do not have one, let me know and we can work with campus IT to let you borrow a laptop with the necessary software.

- Blender is free, and can be gotten from <https://www.blender.org/>
- Unreal Engine is free, and can be gotten from <https://www.unrealengine.com/>

Learning Objectives:

By the end of the course, students will be able to:

- (1) Build and texture game environments using engine tools
- (2) Design complex shaders for environmental features
- (3) Construct a modular building system for interiors
- (4) Model and texture natural objects at various levels of detail
- (5) Refine an environment with lighting, shaders, and details

Course Content

This course is split into two main parts. The first half focuses on building an outdoor environment in Unreal Engine. We'll use landscape tools to sculpt terrain, build shaders for both ground and water, model grass, bushes, and trees in Blender, and then assemble everything into a coherent scene. When we finish with our exteriors, we'll move on to designing modular interior pieces. Once we've built walls, floors, doors, and windows, we can bake them for efficiency and assemble them into a coherent room. During the semester we'll frequently discuss optimization, efficiency, and limitations and alternate processes to the techniques we use. Expect either 2 small assignments per week or 1 larger project.

Grade Breakdown:

Assignments - 60%

Projects - 30% (15% each)

Participation, Discussion, and Feedback - 10%

Each unit's grade will be split evenly between the weekly assignments and the unit's final submission. Letter grades will be given as follows, with + or - given for the highest and lowest 3% in each range, respectively. Incomplete (I) grades will not be assigned without documented, extenuating, circumstances.

90% - 100% A

80% - 89% B

70% - 79% C

60% - 69% D

0% - 59% F

Tentative Schedule:

This schedule is subject to change, but all topics listed will be covered during the semester

Date	Week	Topic	SLOs
6/5	1	Unreal Engine Landscapes	1, 5
6/12	2	Shaders, Water	2, 5

6/19	3	Foliage	1, 2, 4
6/26	4	Level of Detail	2, 4
7/3	5	Environment Assembly	1, 5
7/10	6	Modular Systems	1, 3
7/17	7	Baking	2, 3
7/24	8	Modular Assembly & Tricks	1, 5

Late Work / Absences:

If your work will be late for any reason, please let me know! I will almost always give an extension when requested! For extended absences from sickness or other complications, I will work with you to find an appropriate time to submit the work. Late work without an extension may be penalized 20% per week, or up to 50% in the case of collaborative projects where lateness presents problems to your peers. **Any assignments not submitted by the end of the semester (August 1st, 8/1) will be automatically graded 0%**

Expectations:

Students are expected to conduct themselves in a professional and collegial manner. During Zoom meetings, be professional, appropriate, and mute when not speaking. When posting on discussion boards, be polite, concise, and avoid using internet slang. If you need an extension on an assignment, please email or message me before it is due. Students missing more than 4 consecutive assignments may be dropped from the course.

UNM Administrative Mandate on Required Vaccinations

All students, staff, and instructors are required by UNM Administrative Mandate on Required Vaccinations to be fully vaccinated for COVID-19 as soon as possible, but no later than September 30, 2021, and must provide proof of vaccination or of a UNM validated limited exemption or exemption no later than September 30, 2021 to the UNM vaccination verification site. Students seeking medical exemption from the vaccination policy must submit a request to the UNM verification site for review by the UNM Accessibility Resource Center. Students seeking religious exemption from the

vaccination policy must submit a request for reasonable accommodation to the UNM verification site for review by the Compliance, Ethics, and Equal Opportunity Office. For further information on the requirement and on limited exemptions and exemptions, see the UNM Administrative Mandate on Required Vaccinations.

UNM Requirement on Masking in Indoor Spaces

All students, staff, and instructors are required to wear face masks in indoor classes, labs, studios and meetings on UNM campuses, see masking requirement. Vaccinated and unvaccinated instructors teaching in classrooms must wear a mask. Students who do not wear a mask indoors on UNM campuses can expect to be asked to leave the classroom and to be dropped from a class if failure to wear a mask occurs more than once in that class. With the exception of the limited cases described above, students and employees who do not wear a mask in classrooms and other indoor public spaces on UNM campuses are subject to disciplinary actions.

Disability Statement:

In accordance with University Policy 2310 and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as I am not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow. Contact Accessibility Resource Center at 277-3506 or arc.unm.edu for additional information.

If you need an accommodation based on how course requirements interact with the impact of a disability, you should contact me to arrange an appointment as soon as possible. At the appointment, we can discuss the course format and requirements, anticipate the need for adjustments and explore potential accommodations. I rely on the Disability Services Office for assistance in developing strategies and verifying accommodation needs. If you have not previously contacted them I encourage you to do so.

Academic Integrity:

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of

academic dishonesty or otherwise fails to meet the standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.

Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

Credit-hour Statement:

This is a three credit-hour course. Class is asynchronous, but videos and feedback will be given equivalent to two 75-minute sessions of direct instruction for fifteen weeks during the Fall 2021 semester. Students are expected to complete a *minimum* of six hours of out-of-class work (or homework, study, assignment completion, and class preparation) each week.

Title IX :

In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered “responsible employees” by the Department of Education (see pg 15 - <http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf>). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see: <https://policy.unm.edu/university-policies/2000/2740.html>

Citizenship and/or Immigration Status: All students are welcome in this class regardless of citizenship, residency, or immigration status. Your professor will respect your privacy if you choose to disclose your status. As for all students in the class, family emergency-related absences are normally excused with reasonable notice to the professor, as noted in the attendance guidelines above. UNM as an institution has made a core commitment to the success of all our students, including members of our undocumented community. The Administration’s welcome is found on our website: <http://undocumented.unm.edu/>.