

3D Engines in Practice

CEN 4XXX

Academic Term: Fall 2024

Instructor:

Jeremiah Blanchard

jib@eng.ufl.edu

Office Hours: Tues, Thurs P6

Course Description

Focuses on basic technical knowledge and skill in design, conceptualization, and visualization for three-dimensional engine content production. Coverage of scene and agent development, multi-disciplinary teams, complex pipelines, and production processes. Project-based, culminating in a practical 2D, 2.5D, or 3D application. (3)

Course Pre-Requisites / Co-Requisites

Some prior programming experience

Course Objectives

By the end of the semester, successful students should be able to...

- Conceptualize and plan the systems, design, and visual aesthetics for a 2D/2.5D application.
- Develop an industry standard design document.
- Consider and integrate designs regarding usability and user experience.
- Effectively implement core principles of the design production process.
- Create a final application build including multiple levels in a cohesive executable package.

Professional Component (ABET):

This course serves criteria (b) of ABET Professional Component, namely: “one and one-half years of engineering topics, consisting of engineering sciences and engineering design appropriate to the student’s field of study”. This course constitutes one-semester of engineering-specific coursework.

Relation to Program Outcomes (ABET):

The table below is an example. Please consult with your department’s ABET coordinator when filling this out.

Outcome	Coverage*
1. Ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	High
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	Medium
3. Ability to develop & conduct appropriate experimentation, analyze & interpret data, & use engineering judgment to draw conclusions.	
4. Ability to communicate effectively with a range of audiences	
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	Low
6. Ability to recognize ongoing need for additional knowledge & locate, evaluate, integrate, & apply this knowledge appropriately.	
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	Medium

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

There are no required course materials for this course. All materials will be provided by the instructor. The College of Engineering requires students to have a mobile computing device (laptop).

Performant Programming in Python and Rust, CIS 4930
Jeremiah Blanchard, Summer 2022

Students will require the following software:

- Unity Hub and Unity 2021 LTS Editor (free registration required)
- Microsoft Visual Studio or equivalent.
- Photoshop CC or equivalent.
- GitHub (free registration required)

Course Schedule

Week 1:	Introduction to Design Architecture
Week 2:	Scopes, Pipelining, and Planning
Week 3:	Design Documentation Strategies
Week 4:	Integrating Animations
Week 5:	Interfaces in Engines
Week 6:	Prototype Review (Milestone)
Week 7:	Prototype Testing, Evaluation, and Debugging
Week 8:	Alpha Build Review (Milestone)
Week 9:	Points of Interest (POI) and Parallax Techniques
Week 10:	Integrating Autonomous Agents
Week 11:	Beta Build Review (Milestone)
Week 12:	Tutorials and User Experience Testing
Week 13:	Splash Screen and Icon Design
Week 14:	Final Build Review (Milestone)
Week 15:	Post-Mortem Presentations

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is mandatory. Make-up assignments and other work in this course are consistent with university policies.

Click here to read the university attendance policies:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Evaluation of Grades

Assignment	Points	Pct
Engine Exercises (10)	50 x 10	50%
Milestones (3)	100 x 3	30%
Discussion Participation	100	10%
Final Deliverable & Post-Mortem	10 x 6	6%
Exercises (4-drop-1)	100 x 3	30%
TOTAL	1000	100%

Grading Policy

Percent	Grade	Grade Pts
94 - 100	A	4.00
90 - 93	A-	3.67
87 - 89	B+	3.33
84 - 86	B	3.00
80 - 83	B-	2.67
77 - 79	C+	2.33
74 - 76	C	2.00
70 - 73	C-	1.67
67 - 69	D+	1.33
64 - 66	D	1.00
60 - 63	D-	0.67
0 - 59	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.