

# Introduction to Computational Media

CAP 3027

Academic Term: Fall 2024

## Instructor:

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Phone: 352-294-6650

Office Hours: Listed on Canvas

Office Location: Online office hours carried out via Zoom, link available on Canvas

## Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Canvas website

## Course Description

Credits: 3

An examination of the tools, technologies, and programming techniques used to make visually-oriented applications. Topics covered will include the foundational elements of both 2D and 3D graphics, content creation tools, and the intersection of art and computing.

## Course Pre-Requisites / Co-Requisites

COP3503 or COP3504

## Course Objectives

- Identify the key components of visually-oriented applications
- Describe the tools and methods used to create content, both hand-made and procedurally-generated
- Explain the fundamental concepts of 2- and 3-dimensional art assets
- Utilize existing graphics frameworks to create interactive applications
- Understand the programming challenges in visualizing data

## Materials and Supply Fees

None

## Required Software

Processing

Available for download at: <https://processing.org/>

## Recommended Materials

*The Nature of Code* (<https://natureofcode.com/book/>)

Daniel Shiffman

## Course Schedule

Week		Topics	Assignments (Due at module end)	Assessments
1-2	Module 1	Rendering foundations, pixels and color	P1 – Random walks	Course Orientation Quiz (Q0) Q1, Q2
3-4	Module 2A	Two-way communication in applications, vectors and interpolation	P2 – Random walks with shapes	Q3
	Module 2B	Transformations and hierarchies		Q4
5-6	Module 3A	Image sampling and processing, camera input	P3 – Vectors and moving objects	
	Module 3B	Data Visualization		Q5
7-8	Module 4	3D rendering, cameras, 3D data storage	P4 – 3D	Q6, Midterm Exam

9-10	Module 5A	Content Creation Tools (2D and 3D)	P5 – Procedural terrain generation	
	Module 5B	Procedural Content Creation		Q7
11-12	Module 6	Rendering Detail (lights, textures, shaders)	P6 – Scene loading and lights	Q8
13-14	Module 7	Animation - 2D and 3D, including vertex morphing, articulated animation, skinning and rigging	P7 – Vertex animation	Q9
15	Module 8	Course Wrap Up		Final Exam

(Adjustments may be made to this schedule as the semester progresses)

### ***Attendance Policy, Class Expectations, and Make-Up Policy***

Ultimately you are responsible for the concepts covered throughout the course. Assignments and assessments assume you have watched all related lecture videos and/or demonstration videos, and read any supporting material as well.

#### ***Deadlines and Make-Ups***

Deadlines in this course are final, and submissions after the deadline will not be accepted. Ultimately, it is your responsibility to ensure that assignments are completed on time, and according to specifications. Students are given ample time in this course to complete each assignment. If you wait until the last day to start something, and something goes wrong on that last day, it is not my responsibility. (I've been there before as a student, and I had to live with the consequences.)

Exceptions and make-ups can be made for significant hardships as dictated by university policy (e.g. medical issues, hurricanes, death in the family, etc) with supporting documentation. In addition, students may be granted one (1) single exception to this, according to the following section.

Excused absences or requests for make-ups or exceptions must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

#### ***Single-Use Late Submission Exception***

You may turn in one (1) assignment up to 24 hours after the deadline, with a grade penalty of 50% of the final score for the assignment (so a 100 would become a 50, a score of 42 would become a 21, etc). This is only applicable to the most recent assignment, and only within the 24-hour period following the deadline. You may use this opportunity only once throughout the entire semester, and you must contact your me or your TA to inform them this one-time exception is being invoked. This policy does NOT apply to quizzes and exams.

#### ***Evaluation of Grades***

Over the course of this semester, you may earn up to 1000 points by completing various assignments and exams.

Assignment	Total Points	Percentage of Final Grade
Projects (7 total)	675	67.5%
Quizzes (10, 10 pts each)	100	10%
Discussion Assignment	25	2.5%
Midterm Exam	100	10%
Final Exam (Cumulative)	100	10%
		100%

## ***Grading Policy***

<b>Percent</b>	<b>Grade</b>	<b>Grade Points</b>
100 – 93.4	A	4.00
< 93.4 to 90.0	A-	3.67
< 90 to 86.7	B+	3.33
< 86.7 to 83.4	B	3.00
< 83.4 to 80.0	B-	2.67
< 80 to 76.7	C+	2.33
< 76.7 to 73.4	C	2.00
< 73.4 to 70.0	C-	1.67
< 70.0 to 66.7	D+	1.33
< 66.7 to 63.4	D	1.00
< 63.3 to 60.0	D-	0.67
< 60.0 to 0	E	0.00

More information on UF grading policy may be found at:

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

## ***Grade Posting Timeline***

Grades for assignments will be posted to the Gradebook within two (2) weeks of the assignment deadline.

## ***Grade Challenges***

If a mistake was made on one of your grades, or if you feel a question on an exam was in error, please bring it to my attention! This will include a full regrade of all portions of the assignment.

## ***End of Semester Grade Boosts or Grade Rounding***

I will not round or arbitrarily increase your grade for any reason. If you think a mistake was made on a graded assignment or an exam question, bring it to my attention and—if it is a mistake—I will correct it, generally in your favor! Aside from that, your final grade is what you've earned over the course of the semester. All requests asking for additional points or opportunities to gain points beyond what was already assigned will be denied.

## ***Code Policy***

In this course, students are expected to write their own code for all assignments. You are the one who is being tasked with coming up with a solution to the various programming problems in this course—not your friend, not your roommate, not a stranger on the Internet. The reasoning behind this is that later in your educational career (or if you end up in industry) it will be expected that you are capable of solving problems on your own, if and when the need arises. Even in a team-based environment, each member of that team must be capable of carrying their own weight.

Unless otherwise noted, there are no group or collaborative assignments in this course. When working on assignments, discussion of those assignments with your classmates is not only inevitable, but it is strongly encouraged! (We often learn very effectively in social environments.) That said, you should discuss the problem in high level terms, not telling someone else (or being told) how to write the code. Here are some examples of what could be considered acceptable and unacceptable:

### **Acceptable**

- Talking about the problem
- Using a whiteboard (or paper, or something similar) to draw out the problem
- Looking at someone else's code to help them identify or fix a bug, AFTER you have already completed that portion for yourself

### **Unacceptable**

- Splitting an assignment's work into multiple parts with other students

- Asking someone to send you their code
- Copying someone else's code into your own submission
- Giving another student your code for ANY reason—once you send your code to someone else, you have no control over where it ends up
- Giving another student step-by-step instructions on how to structure a solution to a problem—it's their job to write their code, not yours
- Looking up solutions to problems and using those solutions yourself verbatim
- Viewing solutions to the problems and mimicking those solutions—ask me, or one of the numerous assistants in this course, for help

### ***Consequences for Honor Code Violations***

If you are not capable of completing an assignment on your own, that's okay. Lots of things in life can take time to really "click" for us, and we all learn at different rates. Under no circumstances should you ever consider cheating—that is, submitting someone else's work as your own—as an option. The consequences for doing so will be far worse than if you simply did not do the assignment.

Students will complete this course with honor and integrity, or not at all. Submissions which are believed to be not entirely a student's own work will be reported to administration for disciplinary action. I will recommend the following sanctions be imposed on that student or students:

1. A failing grade (an 'E') for the course
2. That you not be allowed to drop the course for any reason

### ***Regret Clause***

If you submit an assignment, in which you engaged in some of the unacceptable practices listed above (or something similar), you may bring it to my attention within 72 hours of the submission. If you do so, I will assign a failing grade of 0 for the assignment, and you will not be reported to the administration.

### ***AI Policy***

The use of AI code generation tools is not permitted in this course. Doing so will be considered a violation of the Honor Code, subject to the same consequences outlined above. While there are a variety of tools out there that can write code for programs both simple and complex, it is critical that you develop the skills to both create solutions to problems as well as debug those solutions in the (inevitable) event that they don't work exactly as you had intended.

### **Official University of Florida policies:**

#### ***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 professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

#### ***In-Class Recording***

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in

connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### ***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
- Jennifer Nappo, Director of Human Resources, 352-392-0904, [jpennacc@ufl.edu](mailto:jpennacc@ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto: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>

## **Recording Privacy**

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

## **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](mailto: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](mailto: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/>.

#### **COVID-19**

- You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email [covid@shcc.ufl.edu](mailto:covid@shcc.ufl.edu)) to be evaluated for testing and to receive further instructions about returning to campus.
- If you are withheld from campus by the Department of Health through Screen, Test & Protect, you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the [UF Health Screen, Test & Protect website](#) for more information.
- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.

## 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](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

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