

Computer Aided Graphics and Design

EML 2023, Spring 2024

MWF 4th Period – 10:40 AM to 11:30 AM

Zoom Link: <https://ufl.zoom.us/j/95057474192>

Students are to attend all classes, with **camera ON**. Attendance will be taken, and participation will be noted.

Instructor:

Dr. Andrés Rubiano

For all grades-related communications, please contact the TAs directly through a Canvas message. Please type "CAD Student:" before your subject in the subject line.

For all other class communications please attend office hours.

Office Hours: Monday and Wednesday 5:30 PM – 6:30 PM

Zoom Link: <https://ufl.zoom.us/j/95057474192>

Please sign up for an appointment, at least 3 hours in advance, using this link: <https://calendly.com/dr-rubiano/office-hours>

You can sign up for more than one 5-minute slot if you foresee a longer meeting.

Additional Office hours: as many as you want. Send me a Canvas message with a "CAD - Office Hours" subject line and a *when2meet* link with your own availability, and one concise sentence of what you want to discuss, and I'll reply to you with a time that works for both.

Teaching Assistants:

- Nicholas Sardinia - nicholassardinia@ufl.edu – Zoom Link:
Office Hours:
- Andrew Gonzalez – andrewgonzalez@ufl.edu – Zoom Link:
Office Hours:

Course Description

Sketching, descriptive geometry, computer graphics, computer aided drafting and design projects. 3 Credits.

The Southern Association of Colleges and Schools Commission on Colleges provides the federal definition of the credit hour as the equivalent to one hour of in-person instruction and at least two to three hours of out-of-class work per week in a 15-week semester. Source: citt.ufl.edu

Prerequisites

Basic computer knowledge: saving files, renaming files, copying or moving files, differentiating between a zip file and a folder, unzipping zip files, downloading files, opening image files, understanding paths in windows explorer, changing the default program to open a certain file type, uploading files to Canvas, uploading files to OneDrive or other cloud service, taking a screenshot of your Windows screen, using the snipping tool, etc.

First Day Instructions: from your EML 2023 Canvas Course, go to Files, Installation Instructions folder, and follow the instructions in all four PDF files to install and properly set up Acrobat Reader, OBS, SolidWorks, and UF Templates. These must be properly set up during the first day of class. Failure to do so will result in exam issues or mistakes. You will not get a chance to make up for grades that have been affected by not setting up your software properly.

Class Structure:

At least a day before every class meeting, you are to:

- study the one 8-12-minute lecture main video (1-hour worth of lecture content).
- recreate the part, drawing, or assembly used in the video lecture, while recording your work with OBS. Set aside at least an hour to do this.
- record your work while completing the previous lecture's exercises.
- complete the assigned exercises while recording your work with OBS.

Students are to attend all classes. Attendance will be taken, and participation will be noted.

Class meeting times will be used to:

- answer specific questions about lecture videos and classwork.
- expand on the video lecture and add to its contents.
- work on a problem related to the topic covered in the lecture.
- go over supplementary information about SolidWorks, OBS, and templates configuration.
- take pop quizzes.

Course Assignments:

Homework:

- At least a day before every lecture day, you must watch the condensed lecture video, replicate the work shown in it, and record your work with OBS.
- Lecture exercises are to be started over at home and recorded from start to end. This work can be randomly requested for grading.

Quizzes:

Pop quizzes will be given during lecture meetings. Why are there no scheduled quizzes? Studying and memorizing information right before a scheduled quiz does not result in overall retention of knowledge or critical thinking skills.

Before every exam, go to <https://testmy.net/upload> and test your internet upload speeds. You should find a location that guarantees you have at least 5 Mbps of upload speed. This is especially important for quizzes.

There are two types of quizzes: *quick quizzes* and *regular quizzes*.

- Quick quizzes will ask for you to upload a file that you must have created beforehand, as part of any of the assigned exercises or the completion of a video-lecture part. These quizzes will take 5 minutes or less to complete. Be very organized with how you store and label all the files for this course.
- Regular quizzes will consist of a problem statement. The allotted time will depend on the complexity of the quiz. For these quizzes, you will need provide a submission for the actual quiz, as well as the recording of your work:
 - Quiz submissions will be the part file or a *Pack and Go* zip file of a part drawing or assembly that the quiz asks for, or fill in the blank questions with information found in your SolidWorks file; usually distance, mass, volume, or surface area properties.
 - Additionally, starting before you open the quiz on Canvas and until after you submit the quiz, you will record your work with OBS. You will submit this recording to the corresponding *Quiz Recording*.
 - Notice that you should exit Zoom before opening OBS for it to capture your camera properly.

Quiz time will appear limited and quiz problems, challenging, if assigned exercises are not completed. Make sure to ask any questions you have about covered topics at the beginning of class, before the quiz takes place.

Exams:

Four exams will cover the entirety of the material covered in class. The first exam will cover the creation of parts. The second exam will cover the creation of part drawings and includes creating a part (cumulative). The third and fourth exams will cover assemblies, animation, and mechanical mates (cumulative).

We will not meet for class on the day of an exam. The exams will be taken from home starting at 6:30 PM and ending at 7:45 PM. You will record your work, while working on the exam, and submit your recording to the *Recording* assignment. The recording assignment will have a blank textbox, in case you want to include any important comments.

Exams Schedule: February 2nd, February 21st, March 18th, and April 22nd

Project:

Groups of three will work together to submit their project on Monday, April 15th, 2024. Communicate with me if any of the members is not responding, not meeting with you, or not working diligently. Do NOT “divvy up” the work for the project. Each one of you is responsible for your project’s final product. Keep in mind that at any point throughout the semester, a group member might drop the class. Inform me immediately if that happens.

A description of the project can be found in your Canvas course’s files: *Project Instructions.pdf*

Project updates are due February 14th and March 4th, at 10:00 AM

- The first project update consists of a 3-minute OBS recording explaining: a) the topic that you’ve chosen, b) the reference material you are using to aid you in the creation of the explanation, and c) quickly showing all of the individual parts you have created for the project, while pointing out the main features that you used for each.
- The second project update consists of a 2-minute OBS recording quickly showing all part drawings and an overview of the assemblies and sub-assemblies you are using to create the final animation.

Important: work on your project files as the topics are covered in class. Example: if a part of the mechanism you have selected for your project can be created with a revolve feature, create it as soon as we cover revolve features in class.

CSWA Exam:

You will have the chance to take the Certified SolidWorks Associate (CSWA) certification exam between December 6th and December 14th. This exam doesn’t count towards the course grade in any way. You can find more about the exam here: <https://www.solidworks.com/certifications/mechanical-design-cswa-mechanical-design>.

Grading: Homework (0%), Quizzes (0%), Exam 1 (20%), Exam 2 (20%), Exam 3 (15%), Exam 4 (10%, but it can substantially help bring your grade up depending on your results), Project Update 1 (0%, but submission is required), Project Update 2 (0%, but submission is required), Project Update 3 (35%), CSWA Exam (0%)

Make-up Policy: Missed exams will result in a zero grade, except in cases of personal or family emergencies, and will be handled on a case by case basis. In cases of emergency, the missed grade will be replaced by the grade of the following exam due to the cumulative nature of the course. Send Dr. Rubiano a Canvas message after you receive the grade that will replace the zero you initially obtained.

Grade Changes: Corrections of grades should be submitted to the TA as a Canvas message within 5 business days of the grade posting in writing with a concise statement of why you believe there has been an error. Otherwise, the grade will remain unchanged.

File Nomenclature: Last Name, First Name – Exercise Name - Details

Examples:

Rubiano, Andres – Quiz 08 – Part

Sardinia, Nicholas – Quiz 06 – Recording

Gonzales, Andrew – Lecture 13 – Exercise 2

Gonzales, Andrew – Lecture 13 – Exercise 3 Recording

Gonzales, Andrew – Lecture 06 – Exercise 1 Drawing

Sardinia, Nicholas – Lecture 05 – Lecture Video Part

Gonzalez, Andrew – Quiz 14 – Pack and Go

Rubiano, Andres – Quiz 16 – Animation Video

Course Content and Schedule:

| Date | | Day | Content | Lecture | Lecture Links | Important Notes |
|---------|----|-----|---|---------|--|--|
| January | 8 | M | Syllabus | - | - | Follow the <i>First Day Instructions</i> section on the syllabus |
| January | 10 | W | Isometric and Orthogonal Views in SolidWorks SolidWorks Interface and Basics | 1 & 2 | https://youtu.be/Y4gsOdYpiVQ https://youtu.be/bchu5JNc3YA | Nothing to replicate before class No need to record your work |
| January | 12 | F | Extrusion Feature and Sketches | 3 | https://youtu.be/OwZMn3kqU2s | |
| January | 15 | M | Holiday | | - | - |
| January | 17 | W | Reference Geometry | 4 | https://youtu.be/rcEnT14cZEg | |

| | | | | | | |
|----------|----|---|--|----|---|--|
| January | 19 | F | Relations, Trimming, and Offsetting | 5 | https://youtu.be/j6r2bLoxhS0 | (You must have all parts in the Exercises folder completed, before this class) |
| January | 22 | M | Mirroring Sketch and Features | 6 | https://youtu.be/ofj8KCvjTl8 | |
| January | 24 | W | Revolve and Arrays | 7 | https://youtu.be/A-iWmxzJrIQ | Add the fillets that were not added in the video. |
| January | 26 | F | 2D and 3D Sweeps | 8 | https://youtu.be/WZjkVcYyOoA | For the second lecture part, add the fillets to the path, before sweeping it. |
| January | 29 | M | Helix Sweep | 9 | https://youtu.be/gUzh9vTvwEQ | |
| January | 31 | W | Loft and Shell | 10 | https://youtu.be/rzhLnY7JbRw | Watch this short video, related to springs: https://youtu.be/BKW1RNH4c |
| February | 2 | F | Exam 1 | | | Solution to Extension Spring Problem https://youtu.be/HqlkC6_N1N |
| February | 5 | M | Import Pictures, Autotrace, and Combine Features | 11 | https://youtu.be/XCdU01M7t-k | No need to replicate the example in the lecture. |
| February | 7 | W | Equation Driven Curve & Parametric Equations | 12 | https://youtu.be/3ToFwSf916k | |
| February | 9 | F | Toolbox Add-In for Machine Components | 13 | https://youtu.be/d0CI7tyYLz8 | C:\Program Files\SOLIDWORKS Corp\SOLIDWORKS\Toolbox\utilities\sldsetdocprop.exe |

| | | | | | | |
|-----------------|-----------|----------|---|----|--|---|
| February | 12 | M | Drawings Basics in SolidWorks Missing & Redundant Dimensions | 14 | https://youtu.be/9qJS2hRL1Sg | Replicate, removing redundant dimensions and adding missing ones, the following part drawing Lecture 03 - Basics Exercise 2 Lecture 03 - Basics Exercise 1 Lecture 04 - Reference Geometry 2 Lecture 06 - Mirror Exercise 1 |
| February | 14 | W | Auxiliary and Section Views | 15 | https://youtu.be/wskNxGZGqc4 | Project Update 1 Due Lecture 04 - Reference Geometry 1 Lecture 06 - Mirror Exercise 2 Lecture 09 - Springs Exercise 1 |
| February | 16 | F | Helper Views for Part Drawings | 16 | https://youtu.be/tAWIPVKcqol | Lecture 07 - Exercise 1 Lecture 07 - Exercise 2 Lecture 10 - Exercise 1 |
| February | 19 | M | Geometric Dimensioning and Tolerancing | | Open the txt file labelled <i>Crane Links</i> in the Files folder, and watch those lectures. | |
| February | 21 | W | - | | Review | |
| February | 23 | F | Exam 2 | | | |
| February | 26 | M | Assemblies, Mates, and Exploded Views | 17 | https://youtu.be/iYnt8jxwIIM | Nothing to replicate before class |

| | | | | | | |
|----------|----|---|--|----|---|--|
| February | 28 | W | Editing Assemblies, Drawings, Motion and BOM | 18 | https://youtu.be/kUnMhjPQ2H0 | Use the Lecture 17 - Music Lid Parts to replicate the steps of Lecture 17 and 18 (you will need to create the body of the music box). Assemble the scissor jack from the next class. |
| March | 1 | F | Fasteners and Threaded Holes | 19 | https://youtu.be/Dvc8k7VnnWw | Nothing to replicate before class. |
| March | 4 | M | Animation | 20 | https://youtu.be/QgQ40z_Zl4k | Project Update 2 Due. Nothing to replicate before class. |
| March | 6 | W | Advance Mates - Gears | 21 | https://youtu.be/7szznDaQgSk | |
| March | 8 | F | Gears Activity | | No Video Lecture | |
| March | 11 | M | Spring Break | - | - | - |
| March | 13 | W | Spring Break | - | - | - |
| March | 15 | F | Spring Break | - | - | - |
| March | 18 | M | Exam 3 | | | |
| March | 20 | W | Advance Mates - Screws | 22 | https://youtu.be/wCsk2t3momA | |
| March | 22 | F | Screws Activity | | No Video Lecture | Complete the claw mechanism. |
| March | 25 | M | Springs Deformation | 23 | https://youtu.be/hiXWxmQTiAU | Complete the claw mechanism by restricting its motion and adding threads. |

| | | | | | | |
|-------|----|---|----------------------------|----|--|--|
| March | 27 | W | "Deformation" Exercise | | No Video Lecture | Finish the Follower assembly with a fully functional deforming spring. |
| March | 29 | F | Advance Mates - Cams | 24 | https://youtu.be/jbcH0OGs0uM | Complete the bow and arrow assembly with a "stretchable" string. |
| April | 1 | M | Rendering and Visualize | | | |
| April | 3 | W | Motion Analysis | | No Video Lecture | No Video Lecture |
| April | 5 | F | Finite Element Analysis | | No Video Lecture | No Video Lecture |
| April | 8 | M | GD&T Activity | | Open the txt file labelled <i>Crane Links</i> in the Files folder, and watch those lectures. | |
| April | 10 | W | Project Work | | Project Work | Project Work |
| April | 12 | F | Project Work | | Project Work | Project Work |
| April | 15 | M | Project | | | Project Submission Due |
| April | 17 | W | GD&T Activity 2 | | | |
| April | 19 | F | Review | | | |
| April | 22 | M | Exam 4 | | | |
| April | 24 | W | Grades Finalization Begins | | | |

Required Textbooks and Software

SolidWorks 2023, Open Broadcaster Software (OBS), Adobe Acrobat Reader.

Attendance Policy and Class Expectations

Attendance is required. Make-up quizzes and exams are only offered to students who have missed taking them on time due to personal or medical emergencies. Proof of such emergencies is required in every case. When contacting me for a make-up, include your availability to take a make-up as a when2meet.com link.

Technical Issues:

In the event of a technical issue (e.g. SolidWorks or OBS freezing or crashing), try to document as best you can what the issue is. Since you are recording everything you do when working on SolidWorks, the OBS recording can be used to support claims of technical issues. If a simple screenshot of an error makes more sense, take a screenshot when the error occurs. If on the other hand, OBS is the one crashing, try to record your screen with your phone to document that OBS is frozen or giving you an error, preventing you from recording your screen.

Other Course Information

Grading Scale: The final grade will be calculated by the following table.

Table 1. Grading Table. %GE = Percent Grade Earned.

| Percentage Range | Grade Point |
|--------------------|-------------|
| 93.33% GE 100.00 A | 4.00 |
| 90.00% GE 93.33 A- | 3.67 |
| 86.67% GE 90.00 B+ | 3.33 |
| 83.33% GE 86.67 B | 3.00 |
| 80.00% GE 83.33 B- | 2.67 |
| 76.67% GE 80.00 C+ | 2.33 |
| 73.33% GE 76.67 C | 2.00 |
| 70.00% GE 73.33 C- | 1.67 |
| 66.67% GE 70.00 D+ | 1.33 |
| 63.33% GE 66.67 D | 1.00 |
| 60.00% GE 63.33 D- | 0.67 |
| 00.00% GE 60.00 E | 0.00 |

Relation to Program Outcomes (ABET):

| Outcome | Coverage* |
|---|-----------|
| 1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics | High |
| 2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors | High |
| 3) an ability to communicate effectively with a range of audiences | High |
| 4) 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 |
| 5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives | Low |
| 6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions | Medium |
| 7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies | Medium |

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/Links to an external site.> It is important for students to share their accommodation letter with their instructor and discuss their access needs, 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/Links to an external site.> 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/Links to an external site..](https://ufl.bluera.com/ufl/Links%20to%20an%20external%20site..) Summaries of course evaluation results are available to students at [https://gatorevals.aa.ufl.edu/public-results/Links to an external site..](https://gatorevals.aa.ufl.edu/public-results/Links%20to%20an%20external%20site..)

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/process/student-conduct-code/>)[Links to an external site.](#) 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
- 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> [Links to an external site.](#)

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: <https://counseling.ufl.edu> [Links to an external site.](#), 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](#)[Links to an external site.](#), 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/>[Links to an external site.](#)

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>[Links to an external site.](#)

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu/>[Links to an external site.](#)

Library Support, <http://cms.uflib.ufl.edu/ask>[Links to an external site.](#). 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/>[Links to an external site.](#)

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>[Links to an external site.](#)

Student Complaints Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>[Links to an external site.](#); <https://care.dso.ufl.edu/>[Links to an external site.](#)

On-Line Students Complaints: <https://distance.ufl.edu/state-authorization-status/#student-complaint>[Links to an external site.](#)