

# Computer Aided Graphics and Design (SolidWorks)

EML 2023

MWF 5<sup>th</sup> Period

Online (MAE-B 0211)

Spring 2023

## **Instructor:**

Dr. Andrés Rubiano

[ssjandres@ufl.edu](mailto:ssjandres@ufl.edu)

Office Hours: Monday and Wednesday 7:30-8:30 AM

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

Please contact through the Canvas website

- Nicholas Sardinia - [nicholassardinia@ufl.edu](mailto:nicholassardinia@ufl.edu) - <https://ufl.zoom.us/j/2152276571>
- Andrew Gonzalez – [andrewgonzalez@ufl.edu](mailto:andrewgonzalez@ufl.edu) - <https://ufl.zoom.us/j/99848744546>

## **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](http://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 quiz 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:**

Before *every* class meeting, you are to:

- study the one 8-12-minute lecture main video (1-hour worth of lecture content).
- complete the assigned homework 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.
- work on new SolidWorks exercises.

- take quizzes.

## Evaluations

### 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.

*In-class exercises* are to be started over at home, and recorded from start to end. This work can be randomly requested for grading.

When a homework exercise is assigned, students should work on it at home, and once again, record their work.

Any of these three homework activities can be randomly requested for grading during a *quick quiz* in class.

### Quizzes:

Quizzes will be given randomly during lecture meetings. 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 a class exercise, homework assignment, or 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, part drawing, or assembly SolidWorks file 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* assignment. You can upload the recording at any point before 10 PM.

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

### Late submissions.

For every quiz and exam, there will be a *Late Submission* assignment. If you do not submit your quiz or exam in time, regardless of the reason, you'll have the chance to submit your work to this *Late Submission* assignment. The time for which each *Late Submission* assignment will be open will vary depending on the quiz or exam. For every *Late Submission* assignment, you will have the chance to explain the reason why you didn't submit in time. If the reason is NOT an exceptionally unforeseen system issue, your submission will have 20 points deducted from it.

### Exams:

Three 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 exam will cover assemblies, animation, and mechanical mates.

We will not meet for class on the day of an exam. The exams will be taken from home, and they will begin at 6:30 PM. Each exam is 1-hour long. You will record your work, while working on the exam, and submit your recording to the *Recording* assignment. Just like with quizzes, exams will have a *Late Submission* assignment.

A bonus assessment in the form of an exam will take place on the last day of class.

#### Project:

Groups of three will work together to submit their project on Friday, April 7<sup>th</sup>, 2023. Communicate with me if any of the members is not responding, meeting with you, or 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 15<sup>th</sup> and March 8<sup>th</sup>.

- 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.
- 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 April 12<sup>th</sup> and April 19<sup>th</sup>. 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:** Quizzes (40%), Exams (30%), Project (30%), CSWA Exam (0%)

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

Examples:

Rubiano, Andres – Quiz 08 – Part

Sardinia, Nicholas – Quiz 06 – Recording

Rubiano, Andres – Quiz 05 – Late Submission

Gonzales, Andrew – Lecture 13 – In Class Exercise

Gonzales, Andrew – Lecture 13 – In Class Exercise Recording

Gonzales, Andrew – Lecture 06 – Homework Assignment

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 & Examples	Important Dates
January 9	M	Isometric and Orthogonal Views in SolidWorks	1	<a href="https://youtu.be/Y4gsOdYpiVQ">https://youtu.be/Y4gsOdYpiVQ</a>	
January 11	W	SolidWorks Interface and Basics/Quiz	2	<a href="https://youtu.be/bchu5JNc3YA">https://youtu.be/bchu5JNc3YA</a>	
January 13	F	Extrusion Feature and Sketches	3	<a href="https://youtu.be/OwZMn3kqU2s">https://youtu.be/OwZMn3kqU2s</a>	
January 16	M	<b>Holiday</b>			
January 18	W	Reference Geometry	4	<a href="https://youtu.be/rcEnT14cZEG">https://youtu.be/rcEnT14cZEG</a>	
January 20	F	Relations, Trimming, and Offsetting	5	<a href="https://youtu.be/j6r2bLoxhS0">https://youtu.be/j6r2bLoxhS0</a>	
January 23	M	Mirroring Sketch and Features	6	<a href="https://youtu.be/ofj8KCvjT18">https://youtu.be/ofj8KCvjT18</a>	
January 25	W	Revolve and Arrays	7	<a href="https://youtu.be/A-iWmxzJrlQ">https://youtu.be/A-iWmxzJrlQ</a>	
January 27	F	2D and 3D Sweeps	8	<a href="https://youtu.be/WZjkVcYyOoA">https://youtu.be/WZjkVcYyOoA</a>	
January 30	M	Helix Sweep	9	<a href="https://youtu.be/gUzh9vTvweQ">https://youtu.be/gUzh9vTvweQ</a>	
February 1	W	Loft and Shell	10	<a href="https://youtu.be/rzhLnY7JbRw">https://youtu.be/rzhLnY7JbRw</a>	
February 3	F	Import Pictures, Autotrace, and Combine Features	11	<a href="https://youtu.be/XCdU01M7t-k">https://youtu.be/XCdU01M7t-k</a>	
February 6	M	Equation Driven Curve & Parametric Equations	12	<a href="https://youtu.be/3ToFwSf916k">https://youtu.be/3ToFwSf916k</a>	
February 8	W	Toolbox Add-In for Machine Components	13	<a href="https://youtu.be/d0C17tyYLz8">https://youtu.be/d0C17tyYLz8</a>	
February 10	F	Exam 1 Practice		No Video Lecture	
February 13	M	Exam 1			
February 15	W	Drawings Basics in SolidWorks	14	<a href="https://youtu.be/9qJS2hRL1Sg">https://youtu.be/9qJS2hRL1Sg</a>	Project Update 1
February 17	F	Missing & Redundant Dimensions		No Video Lecture	
February 20	M	Auxiliary and Section Views	15	<a href="https://youtu.be/wskNxGZGqc4">https://youtu.be/wskNxGZGqc4</a>	
February 22	W	Helper Views for Part Drawings	16	<a href="https://youtu.be/tAWIPVKcqoI">https://youtu.be/tAWIPVKcqoI</a>	
February 24	F	Exam 2 Practice		No Video Lecture	
February 27	M	Exam 2			
March 1	W	Assemblies, Mates, and Exploded Views	17	<a href="https://youtu.be/iYnt8jxwIIM">https://youtu.be/iYnt8jxwIIM</a>	
March 3	F	Editing Assemblies, Drawings, Motion and BOM	18	<a href="https://youtu.be/kUnMhjPQ2H0">https://youtu.be/kUnMhjPQ2H0</a>	
March 6	M	Fasteners and Threaded Holes	19	<a href="https://youtu.be/Dvc8k7VnnWw">https://youtu.be/Dvc8k7VnnWw</a>	
March 8	W	Animation	20	<a href="https://youtu.be/QgQ40z_Z14k">https://youtu.be/QgQ40z_Z14k</a>	Project Update 2
March 10	F	Advance Mates - Gears	21	<a href="https://youtu.be/7szznDaQgSk">https://youtu.be/7szznDaQgSk</a>	
March 13	M	<b>Spring Break</b>			
March 15	W	<b>Spring Break</b>			
March 17	F	<b>Spring Break</b>			
March 20	M	Gears Activity		No Video Lecture	
March 22	W	Advance Mates - Screws	22	<a href="https://youtu.be/wCsk2t3momA">https://youtu.be/wCsk2t3momA</a>	
March 24	F	Screws Activity		No Video Lecture	
March 27	M	Springs Deformation	23	<a href="https://youtu.be/hiXWxmqtIAU">https://youtu.be/hiXWxmqtIAU</a>	
March 29	W	"Deformation" Exercise		No Video Lecture	
March 31	F	Advance Mates - Cams	24	<a href="https://youtu.be/jbcH0OGs0uM">https://youtu.be/jbcH0OGs0uM</a>	
April 3	M	Rendering	25	No Video Lecture	
April 5	W	Project Finalization		No Video Lecture	
April 7	F	Project Finalization		No Video Lecture	
April 10	M	Exam 3 Practice		No Video Lecture	Project Submission
April 12	W	Exam 3			
April 14	F	Motion Analysis	26	No Video Lecture	
April 17	M	Motion Analysis 2		No Video Lecture	

April	19	W	Geometric Dimensioning and Tolerancing (GD&T)	28	Check the "Crane's Links" file
April	21	F	Geometric Dimensioning and Tolerancing (GD&T)		No Video Lecture
April	24	M	SolidWorks FEA	29	No Video Lecture
April	26	W	Bonus Assessment		

**Required Textbooks and Software**

SolidWorks 2022, Open Broadcaster Software (OBS), Adobe Acrobat Reader.

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

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 as a when2meet.com link.

**Grade Corrections:**

Corrections of grades should be submitted to instructor within 5 business days of the grade posting in writing with a concise statement of why you believe there has been an error. Note that the instructor has the final determination in the grade assigned. If a grade change is requested, it may result in a lower grade.

**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):***

<b>Outcome</b>	<b>Coverage*</b>
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/>. 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/>. 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/process/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>

## ***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:** <https://counseling.ufl.edu>, 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/>.

### ***Academic Resources***

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

**Career Connections Center**, Reitz Union, 392-1601. Career assistance and counseling; <https://career.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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

**On-Line Students Complaints:** <https://distance.ufl.edu/state-authorization-status/#student-complaint>.