

# Computer Aided Graphics and Design

EML 2023 Section 227A Class # 13534

**Class Periods:** MWF, 9<sup>th</sup> period, and 4:05-4:55pm

**Location:** Online (access via <https://elearning.ufl.edu/>)

**Academic Term:** Fall 2020

## Instructor

Ashok V. Kumar

Email Address: [akumar@ufl.edu](mailto:akumar@ufl.edu)

Office Phone Number: 352-392-0816

Office Hours: MWF, 10:00am-11:00am, via zoom

## Teaching Assistants

Please contact through the Canvas website

- Patrick Neal, [neap@ufl.edu](mailto:neap@ufl.edu)
- Chris Maudlin,

## Course Description

Credit hours: 3; Sketching, descriptive geometry, computer graphics, computer aided design and design projects

## Course Pre-Requisites / Co-Requisites

None

## Course Objectives

The primary objective of the course is to educate students on the main concepts of computer-aided design: solid modeling, assembly design, engineering drawing conventions, dimensioning and tolerance specification. In addition, conceptual design skills such as creative thinking and idea illustration by sketching are taught.

## Professional Component (ABET)

The course provides mechanical systems design experience through a final project which provides the students an opportunity to develop the design of a mechanical device starting from the conceptual design all the way to detailed drawings with all dimensions and tolerances specified.

## 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	Low
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	Low
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	
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	
6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Low

\*Coverage is given as high, medium, or low. An empty box indicates outcome not significantly addressed by this course.

## Required Textbooks and Software

**Text:** No required textbook

**Software:** SolidWorks (Instructions for downloading will be provided in class)

Canvas: <https://elearning.ufl.edu/> (E-learning system) for additional reading material.

**Online resource:** LinkedIn learning - Solidworks 2019 tutorial

## Recommended Materials

1. Title: Graphics Technology  
Author: James H. Earle; Publisher: Prentice Hall  
Edition: 2<sup>nd</sup> edition; ISBN: 9780131476431

2. Title: Geometric Dimensioning and Tolerancing Workbook  
 Author: Neumann, A.; Available at Target Copy Center, 1412 W University Ave.

**Course Content**

- (i) Introduction to Mechanical Design
- (ii) 3D visualization and sketching: Isometric, oblique and perspective views
- (iii) 6-view orthographic projections
- (iv) Drawing generation in CAD software
- (v) Constrained sketching in CAD software
- (vi) CAD: Solid Modeling, feature based parametric models and design intent
- (vii) Dimensioning and tolerances
- (viii) Hole basis and Shaft basis ANSI and ISO Tolerances
- (ix) Clearances and Fits
- (x) Threaded fasteners
- (xi) Geometric Dimensioning and Tolerances (GDT)
- (xii) Introduction to rapid prototyping

**Make-up Policy:**

Late assignments will receive 75% credit if submitted within the time allowed on Canvas and will not be graded thereafter. Make up exams will be given only for students with medical reasons for missing the exam. Documentation in the form of a doctor’s note must be provided for make-up exams and homework.

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

Attendance is mandatory and you are responsible for the knowledge of all scheduling and policy announcements in class. Please respect the rights of other students in the class and do not engage in activities that disturb or distract the class. Excused absences must be consistent with university policies in the undergraduate catalog: (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

**Evaluation of Grades**

Assignment	Percentage of Final Grade
Homework Sets	50%
Quizzes & Class activity	10%
Exams	30%
Final Project	10%
Total	100%

**Grading Policy**

Percent	Grade	Grade Points
> 93	A	4.00
< 93 - 90	A-	3.67
< 90 - 87	B+	3.33
< 87 - 84	B	3.00
< 84 - 80	B-	2.67
< 80 - 77	C+	2.33
< 77 - 74	C	2.00
< 74 - 70	C-	1.67
< 70 - 67	D+	1.33
< 67 - 64	D	1.00
< 64 - 60	D-	0.67
< 60	E	0.00

**Online 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.

### ***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 to present 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.a.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.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.a.ufl.edu/public-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://www.dso.ufl.edu/sccr/process/student-conduct-honor-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. A violation of the honor code will result in academic sanctions (typically a failing grade assigned for the course) and further disciplinary action. If you have any questions or concerns, please consult with the instructor or TAs in this class.

### ***Software Use and Copyrighted Material***

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use and the use of copyrighted material. 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: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.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:** <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

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

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