

Computer Aided Graphics and Design
EML2023 Sections: 538F (20338), 619G (20339)
Class Periods: MWF 7th, 9th period
Location: FAB-105, MCCC-100
Academic Term: Fall 2025

Instructor:

Ashok V. Kumar

Email Address: akumar@ufl.edu

Office: NEB 535

Office Phone Number: 352-392-0816

Office Hours: MWF 10:30-11:30am

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

TBD

Course Description

Credit hours: 3; Solid and assembly modeling, computer aided design, geometric dimensioning and tolerancing, 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.

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. 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	Medium
3. An ability to communicate effectively with a range of audiences	High - Assessed
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	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	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

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 tutorial

Recommended Materials (optional)

- Title: Graphics Technology
Author: James H. Earle; Publisher: Prentice Hall
Edition: 2nd edition; ISBN: 9780131476431
- 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) Constrained sketching in CAD software
- (v) Feature based Solid Modeling: Extrude, Revolve, Loft, and Sweep features
- (vi) Modification features: Fillet, Chamfer, Draft, Shell, Patterns
- (vii) Assembly modeling
- (viii) Drawing generation in CAD software
- (ix) Dimensioning and tolerances
- (x) Hole basis and Shaft basis ANSI and ISO Tolerances
- (xi) Clearances and Fits
- (xii) Threaded fasteners
- (xiii) Geometric Dimensioning and Tolerances (GDT)
- (xiv) Introduction to rapid prototyping

Course Schedule:

22-Aug	Introduction
25-Aug	Notes 6-view Orthographic proj. sketching
27-Aug	Isometric dwgs; Example problems
29-Aug	Sectional Views
1-Sep	<i>Labor Day Holiday</i>
3-Sep	Help hwk1; Intro to Solid Works (single extrude part)
5-Sep	Class Activity - 1 Constrained sketching - Offset contour, Mirror examples
8-Sep	Class activity - 2 Constrained sketch
10-Sep	Class Activity -3 Multi-extrude part
12-Sep	Class Activity -4 Multi-extrude part
15-Sep	Drafting
17-Sep	Class activity - 5 (Thin Extrude)

19-Sep	Class activity - 6 (Revolve part)
22-Sep	Class activity - 7 (Revolve Pattern)
24-Sep	Class activity - 8 ExtrudeRefPlane
26-Sep	Class activity - 9 Shell
29-Sep	ClassActivity-11 Assembly-1
1-Oct	Class activity - 12 Assembly Chain
3-Oct	Assembly drawing
6-Oct	ClassActivity-10 Reference Geometry
8-Oct	Class activity - 13 Loft and sweep
10-Oct	Class activity - 14 Loft sweep (Jar)
13-Oct	Class activity - CSWA-1
15-Oct	Class activity - 15 Assembly Pattern
17-Oct	<i>Home Coming Holiday</i>
20-Oct	Class activity - CSWA-2
22-Oct	Class activity - CSWA-3
24-Oct	Class activity - CSWA-4
27-Oct	Project concept
29-Oct	CSWA Exam
31-Oct	Helix class activity
3-Nov	Screw Threads
5-Nov	Rapid Prototyping
7-Nov	RP class activity
10-Nov	Clearance Fits
12-Nov	GDT-1
14-Nov	GDT-2
17-Nov	GDT-3
19-Nov	GDT-4
21-Nov	GDT-5
24-28 Nov	<i>Thanksgiving Holiday</i>
1-Dec	GDT-6
3-Dec	GDT-Quiz

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. 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 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.

Requirements for class attendance and make-up exams, 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	Percentage of Final Grade
Homework	50%
Quizzes and Class Activity	20%

Exam	15%
Final Project	15%
	100%

Grading Policy

The following is given as an example only.

Percent	Grade	Grade Points
93 - 100	A	4.00
90 - 93	A-	3.67
86 - 90	B+	3.33
83 - 86	B	3.00
80 - 83	B-	2.67
76 - 80	C+	2.33
73 - 76	C	2.00
70 - 73	C-	1.67
66 - 70	D+	1.33
63 - 66	D	1.00
60 - 63	D-	0.67
0 - 60	E	0.00

More information on UF grading policy may be found at:

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

Academic Policies & Resources

The university-wide student resources to academic policies and campus resources can be found at:

<https://go.ufl.edu/syllabuspolices>.

Commitment to a Positive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values.

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 Coordinator • HWCoe Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu • Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu