

University of Kansas
Department of Aerospace Engineering
AE 421 Aerospace Computer Graphics
Spring 2000

Instructor: Dr. Rick Hale, 3019A Learned Hall
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Phone: 864-2949
Office hours: 1:30-3:00 M-F, by appointment, or as
available

GTA:

Aero-CADD: Mr. Kurt Schueler, 1019 Learned Hall, 4-2972
Office hours: TR 6:00-7:00 PM (3040 Lea)

Drafting: Mr. Daniel Vahidi, 1019 Learned Hall, 4-2972
Office hours: TR 2:30-4:30

Textbooks:

F.E. Giesecke, et. al. "Principles of Engineering Graphics", Second Edition, Macmillan, 1994.

Course Objectives:

The course objectives are to explore elements of two and three-dimensional descriptive geometry with emphasis on spatial visualization and applications to aerospace vehicles and systems. Students will develop skills in using instruments, both traditional and computer-based, to depict aerospace vehicles and their components and systems for purposes of illustration, design and analysis. By the end of the course student should be capable of:

- Accurately conveying geometry of aerospace vehicles
- Properly documenting required geometric tolerances
- Applying existing CAD software tools to real-world designs

Course Topics:

- Two-dimensional constructions, sketching
- Geometric modeling

- Introduction to computer-based modeling
- Three-dimensional modeling and surfacing
- Aerospace configuration development
- Parametric modeling
- Integration of design and analysis
- Design and drawing projects

Evaluation:

Grades will be based on weekly homework assignments and design projects (55%), one midterm examination (10%), a final design project (20%) and a final exam (15%). Each student is expected to actively participate in class discussions and design reviews.

Individual lab and design grade scores may be reduced by up to 20% for failure to attend related classes, at the discretion of the GTA.

Policies:

Homework is usually due at the beginning of the class period one week after assigned. Late homework will not be accepted unless approved by the instructor or GTA *prior* to the homework due date. Even if approved, late homework may be assessed a 10% reduction for every day past the original due date.

Any student in this course who has a disability that may prevent him or her from demonstrating his or her full abilities should contact me personally as soon as possible to discuss necessary accommodations.

lsn	date	day	topic	reading
1	Jan. 18	T	Introduction Aero-CADD Overview	
2	Jan. 20	R	Instruments & lettering Aero-CADD Introduction, Drafting assistant, customization	Chap. 1-4
3	Jan. 25	T	Geometric constructions Environment settings, layers, printing, file import/export	Chap. 5
4	Jan. 27	R	Sketching and shape description Wireframes: views, planes, points, lines, arcs, circles, ellipses	Chap. 6

5	Feb. 1	T	Multiview drawing Wireframes: conics, splines, helix	Chap. 7
6	Feb. 3	R	Mathematics of splines, conics... Wireframes: curve editing, transformations	
7	Feb. 8	T	CAD/CAM Design explorer, associativity, editing objects, show, verify	Chap. 8
8	Feb. 10	R	Sectional views Adding text and dimensions	Chap. 9
9	Feb. 15	T	Auxiliary views Surfacing: introduction, creating surfaces	Chap. 10
10	Feb. 17	R	Mathematics of surfaces Surfacing: editing surfaces	
11	Feb. 22	T	Manufacturing Polyconic surfacing	Chap. 12
12	Feb. 24	R	Dimensioning Aeropack tools (airfoils, planforms, area curves)	Chap. 13
13	Feb. 29	T	Dimensioning Details: symbols, review	
14	Mar. 2	R	Tolerancing Detail design: surfacing internal geometry	Chap. 14
15	Mar. 7	T	Tolerancing Airplane components: wings (lifting surfaces)	
16	Mar. 9	R	Threads, fasteners, spacers Airplane components: control surfaces, flaps	Chap. 15
17	Mar. 14	T	Threads, fasteners, spacers Airplane components: wings, flaps, interference checks	
18	Mar. 16	R	Midterm exam	
	Mar. 20	M-F	Spring Break	
19	Mar. 28	T	Axonometric projection Airplane components: fuselage	Chap. 17
20	Mar. 30	R	Axonometric projection Airplane components: wing-fuselage fillet	
21	Apr. 4	T	Oblique projection Airplane components: wing-fuselage fairing	Chap. 18
22	Apr. 6	R	Oblique projection Airplane components: Inlets	
23	Apr. 11	T	Projects Airplane components: systems, systems interference checks	
24	Apr. 13	R	Mathematics of solids Introduction to solids (Unigraphics)	

25	Apr. 18	T	Graphics translation standards
			Introduction to solids
26	Apr. 20	R	Projects
			Parametric modeling, graphics translation
27	Apr. 25	T	Projects
28	Apr. 27	R	Projects
29	May 2	T	Projects
30	May 4	R	Projects
	May 9	T	Stop Day
	May 10	W	Finals begin