AE 140 – Computer-Aided Design
Spring 2025

Course Structure: Lecture twice per week **Location:** 406B1 Engineering Hall
Days and Time: Tuesdays and Thursdays 10 AM (A), 11 AM (B), or 12 PM (C) **Credit:** 2 hours

Course Objectives:
Throughout this course, students will be able to:

- Learn computer-aided design (CAD) techniques for modeling engineered components.
- Apply those techniques through sketching, three-dimensional solid modeling, complex surface modeling, and assembly modeling.
- Proficiently utilize a specific CAD package and understand how to apply the design and modeling techniques to other software packages.
- Create dimensioned drawings using best practices from CAD models and hand sketches.
- Improve spatial visualization skills using sketching exercises emphasizing isometric view and multi-view drawings.
- Utilize these skills to create an aerospace engineering-themed final project.

Instructor	Teaching Assistant
Julia Laystrom-Woodard	Sangwoo Suk
Office Location: Talbot 315	Office Location: Talbot 206 (computer lab)
E-mail: laystrom@illinois.edu	E-mail: ssuk4@illinois.edu
Office hours: 3:00 – 4:30 PM Tuesdays 1:30 – 3:30 PM Thursdays Talbot 315	Office hours: TBD

Course Website: https://canvas.illinois.edu
The Canvas website for this course will be used **extensively** for communicating important course announcements, posting class presentations, and submitting all assignments (in-class and homework).

Additional Website: Discord → https://discord.gg/NkFXQkHZmH

Class Materials:

Required Text: Siemens NX 2023 for Designers by Sham Tickoo, 15th Edition, published by CADCIM Technologies, 2023. Available at IUB, publisher website CADCIM.com/nx or Amazon. E-Book is OK.

Supplemental Text: Engineering Design Graphics: Sketching, Modeling, and Visualization 3rd edition by James M. Leake, Molly Hathaway Goldstein, and Jacob L. Borgerson, published by John Wiley & Sons, Inc., 2022. Available at Amazon and on reserve at Grainger Engineering Library.

Software: Siemens NX – Available in 206 Talbot and 406B1 & 110A Engineering Hall EWS Labs.

Grading:		
	Attendance and In-Class Exercises (minimum one file per lecture, 2 drops)	10%
	Homework Assignments (approximately 11; 1 drop)	55%
	Final Project (progress, NX, and presentation)	25%
	Mid-Term Quiz	10%

Grades will be assigned using the standard letter grade definitions with +/-; there will be no curve.

Absence Policy:

Your attendance at all scheduled classes is mandatory and essential for your success in the course. However, circumstances occasionally occur where you need to miss a class. Starting with the second scheduled lecture, **two unquestioned excused absences are given to each student and will count as grade drops for those two in-class exercises.**

Planned Absences: If you need to miss class for a religious observance or another valid reason, you must make arrangements to make up the missed work at least one week before the absence occurs. Otherwise, the absence will be considered unexcused, and the missed assignments cannot be made up or given full credit.

Serious Illness / Family Emergency: Do not attend class if you are very sick. We must all work together to avoid spreading illnesses in our community.

If you are seriously ill or experiencing a family emergency and you will miss more than two lectures, e-mail the instructor as soon as possible. Arrangements may be made to make up the in-class exercise or extend the homework deadline. It is best to email the instructor *before* the class period(s) that you will miss. Additionally, attendance at the instructor's office hours may be necessary to make up the in-class exercise.

Mental Health:

Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Student Health Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

- Counseling Center (217) 333-3704
- McKinley Health Center (217) 333-2700
- National Suicide Prevention Lifeline (800) 273-8255
- Rosecrance Crisis Line (217) 359-4141 (available 24/7, 365 days a year)

If you are in immediate danger, call 911.

Anti-Racism and Inclusivity Statement:

This course is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs. This course recognizes that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to Campus Belonging Resources

(https://diversity.illinois.edu/diversity-campus-culture/belonging-resources/). Based on your report, Members of the Office of the Vice Chancellor for Diversity, Equity & Inclusion staff will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.

Academic Integrity:
Violations of academic integrity are unacceptable.

In this course you are expected to produce *your own* work in all assignments.

The University of Illinois at Urbana-Champaign Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: http://studentcode.illinois.edu/.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: https://studentcode.illinois.edu/article1/part4/1-401/.

Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Disability-Related Accommodations:
To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class should contact Disability Resources and Educational Services (DRES) and see the instructor as soon as possible. If you need accommodations for any sort of disability, please speak to me after class, or make an appointment to see me or see me during my office hours. DRES provides students with academic accommodations, access, and support services. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TDD), or e-mail disability@illinois.edu. http://www.disability.illinois.edu/.

Sexual Misconduct Reporting Obligation:
The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: https://wecare.illinois.edu/resources/students/#confidential

Emergency Response Recommendations:
Emergencies can happen anywhere and at any time, so it's important that we take a minute to prepare for a situation in which our safety could depend on our ability to react quickly. Take a moment to learn the different ways to leave this building. If there's ever a fire alarm or something like that, you'll know how to get out and you'll be able to help others get out. Next, figure out the best place to go in case of severe weather – we'll need to go to a low-level in the middle of the building, away from windows. And finally, if there's ever someone trying to hurt us, our best option is to run out of the building. If we cannot do that safely, we'll want to hide somewhere we can't be seen, and we'll have to lock or barricade the door if possible and be as quiet as we can. We will not

leave that safe area until we get an Illini-Alert confirming that it's safe to do so. If we can't run or hide, we'll fight back with whatever we can get our hands on. If you want to better prepare yourself for any of these situations, visit police.illinois.edu/safe. Remember you can sign up for emergency text messages at emergency.illinois.edu.
Emergency response recommendations can be found at the following website:
http://police.illinois.edu/emergency-preparedness/.
For more information, review this website and the campus building floor plans.
http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/.

Course Outline - AE 140 Fall 2025

and Tentative Schedule

Week	Day	Date	Topic	Book Chapters
1	Tues.	8/26	Course Introduction	
	Thur.	8/28	Introduction to the NX Software Package	1
2	Tues.	9/2	Working with Sketches	2 - 4
	Thur.	9/4	Working with Sketches	2 - 4
3	Tues.	9/9	Working with Sketches	2 - 4
	Thur.	9/11	Working with Sketches	2 - 4
4	Tues.	9/16	Datum Planes and Axes	5
	Thur.	9/18	3D Modeling Tools	6 - 7
5	Tues.	9/23	3D Modeling Tools	6 - 7
	Thur.	9/25	Hand Sketching and Visualization Introduction	Leake Ch. 2 & 3
6	Tues.	9/30	3D Modeling Tools	6 - 7
	Thur.	10/2	Oblique & Isometric Sketches	Leake Ch. 3
7	Tues.	10/7	Surface Modeling	10-11
	Thur.	10/9	Multiview Sketches / Final Projects Assigned	Leake Ch. 4
8	Tues.	10/14	Surface Modeling / Final Project topics due	10 - 11
	Thur.	10/16	Missing View Sketches	Leake Ch. 4
9	Tues.	10/21	Surface Modeling	10 - 11
	Thur.	10/23	Cumulative Quiz (covers W01D1 – W08D2)	During lect.
10	Tues.	10/28	Surface Modeling	10 - 11
	Thurs.	10/30	Drafting & Dimensioning	Leake Ch. 6
11	Tues.	11/4	Drafting in NX / GD&T	12
	Thur.	11/6	Dimensioning and Isometric	Leake Ch. 6
12	Tues.	11/11	Assemblies	8 - 9
	Thur.	11/13	Assemblies / Final Project progress due	8 - 9
13	Tues.	11/18	Assemblies	8 - 9
	Thur.	11/20	Exploded Assembly, Drafting in NX	8 - 9
	Tues.	11/25	Fall Break	
	Thur.	11/27	Fall Break	
14	Tues.	12/2	Sequence Movies	supplemental
	Thur.	12/4	Rendering and Visualization Tools	13
15	Tues.	12/9	Rendering & Viz. Tools & Course Wrap-up	13
	Wed.	12/10	Final Project NX Files Due	midnight
Finals Week			Final Project PowerPoint Files Are Due **The Night Before** Each Section Presentations	8:00 PM
Finals Week	Thurs.	12/18	Final Project Presentations (A - 10 AM)	1:30-4:30 PM
Finals Week	Fri.	12/12	Final Project Presentations (B - 11 AM)	8:00-11:00 AM
Finals Week	Tues.	12/16	Final Project Presentations (C - 12 PM)	8:00-11:00 AM

If a class begins at...	And first meets on...	The exam is given...
7:00 or 7:30 a.m.	Any day of the week	Arranged by instructor to avoid conflicts between Dec. 12 and Dec. 18
8:00 or 8:30 a.m.	Monday	7:00pm-10:00pm., Thursday Dec. 18
8:00 or 8:30 a.m.	Tuesday	7:00pm-10:00pm., Friday Dec. 12
9:00 or 9:30 a.m.	Monday	8:00am-11:00am., Monday Dec. 15
9:00 or 9:30 a.m.	Tuesday	1:30pm-4:30pm., Friday Dec. 12
10:00 or 10:30 a.m.	Monday	8:00am-11:00am., Thursday Dec. 18
10:00 or 10:30 a.m.	Tuesday	1:30pm-4:30pm., Thursday Dec. 18
11:00 or 11:30 a.m.	Monday	8:00am-11:00am., Wednesday Dec. 17
11:00 or 11:30 a.m.	Tuesday	8:00am-11:00am., Friday Dec. 12
noon or 12:30 p.m.	Monday	1:30pm-4:30pm., Thursday Dec. 18
noon or 12:30 p.m.	Tuesday	8:00am-11:00am., Tuesday Dec. 16

https://registrar.illinois.edu/courses-grades/final-exam-schedule-public/