SE101B MCAD – Engineering Graphics and Design

Fall Semester 2024

Instructor: Professor Molly Goldstein, PhD 309 Transportation 300-8169 mhg3@illinois.edu

Teaching assistants: Alexandra Hosny, Tej Sapkota, Prathmesh Rathod, In-Bum Chung, Simon Zhang (Head TA)

Class times and location: Lecture – Tuesday and Thursday, 11am-11:50am, 3031 Campus Instructional Facility. Sketching lab and Modeling lab– time as registered, 207 Transportation Bld and 316 Transportation Bld, respectively.

Prof. Goldstein Office hours and location: Wednesdays noon-1pm 309TB and by appointment. TA office hours and LA lab hours are listed on Canvas.

Preferred method of contact: My preferred method of contact is in-person during office hours. I will also respond to email messages and can set up separate appointment times, but please keep in mind that I make take a full day to respond. Please include SE101B in the subject line of all emails.

Course structure:	Credit hours	three
(Credit & contact hours)	Lecture	twice a week for 50-min period
	Modeling Lab	once a week for 110-min period
	Sketching Lab	once a week for 50-min period

You will attend two 50-minute "lecture" sections each week (Lecture). You will also attend one 50-minute sketching lab (Studio) and one 110-minute computer modeling lab (Modeling Lab).

SE101 follows the model of a flipped classroom. Before lecture and modeling lab, you will watch custom-developed online modules (videos) related to course topics. In class, you will work on activities in teams or pairs related to the day's topics. In essence, what is traditionally considered as homework is initiated during class. What is traditionally called lectures are delivered in the form of online modules frequently. Your labs will serve as active design project collaboration time at the first half of the week while the second, larger lab will serve as hands-on modeling time to develop proficiency with Autodesk Revit (SE101A) or Autodesk Fusion 360 (SE101B).

Teaming: You will be assigned to a team in this course. On this team, you will complete many assignments and activities including a semester long design project. Your performance as a team member is part of your course grade. Past SE 101 students have found their teaming experience in this course to be worthwhile and rewording.

Text: *Engineering Design Graphics: Sketching, Modeling, and Visualization,* 3rd edition, by Leake, Goldstein, and Borgerson

Web: Illinois Canvas (https://canvas.illinois.edu/)
Autodesk Education Community

Supplies: Portable storage device (USB flash device or portable HD)
Mechanical pencils - 0.5, 0.7 mm

Software:

Autodesk Fusion 360 (SE101B)
Canvas. The SE101 teaching team will communicate with you primary via Canvas outside of class. Within Canvas, you will have access to course announcements, schedule, assignments, practice exams, grades, feedback, and course resources.

CATME: You will use CATME to submit information used for Team Formation and Peer & Team Evaluations

Course Goals:

1. To develop spatial visualization and reasoning skills.
2. To gain familiarity with the standards and conventions of engineering design graphics.
3. To use geometric modeling software (e.g., parametric) as a design and visualization tool. Emphasis placed upon learning general modeling concepts and techniques.
4. To gain exposure to digital simulation and prototyping tools commonly used in product design.
5. To develop sketching skills using pencil and paper, and digital tablets.
6. To introduce engineering design methodology, and to demonstrate the role of graphics in the engineering design process.
7. To provide insight into the product design process, in particular as it relates to the architecture and functionality of the product.

Grading:

35%	Design Project (25% Team, 10% Individual)
16%	Lab assignments (modeling, sketching) – drop 1 lowest
15%	Modeling Test
10%	Sketching Quizzes– drop 1 lowest
10%	Theory quizzes (2 at 5% each)
10%	Lecture worksheets and reflection activities
4%	Participation in Lab and Pre-labs

In this course, we will be assigning +/- letter grades.

Please note the total points in the course will be out of a possible 2000, and assignments will be scaled to appropriately match the percentages at the end of the semester.

The purpose of grading is to assess your understanding and utilization of the concepts taught in the course, and to provide you with feedback about the strengths and weaknesses evident in your work. Full credit may be awarded on items that are mostly correct even if the work still contains errors in understanding. Therefore, it is important that you not only check your score on a particular assignment or exam, but also review the feedback provided by the graders. This feedback will help you improve your understanding of the concepts being assessed and, in turn, improve your performance on future work.

Late Policy. You may submit any of your lab assignments (modeling or sketching) up to one week late for a 20% penalty. After one week, we will not accept any late assignments. If you have a legitimate reason to miss an assessment you must contact Prof. Goldstein in advance to work out another arrangement.

Concerns About Grading. If you have concerns about how an assignment was graded, send an email to your graduate teaching assistant (TA) with a detailed description of the concern within seven days after the

graded assignment was revealed in Canvas. Please see Communication with the Teaching Team (below) for proper email etiquette.

Teaching Team:

Each SE 101 section is served by a teaching team that includes one instructor (Professor Goldstein), one graduate teaching assistant (TA), and a team of undergraduate lab assistants (LA). See the Course Contacts in Canvas for names and contact information for your section's TA and LAs.

Class Participation:

SE 101 embraces the idea that everyone in our learning environment helps shape the environment so that it is positive and productive for all. This includes arriving for class on time and being prepared, focusing on course activities during class, controlling your behavior to minimize distractions to those around, and engaging with others in a respectful and professional manner.

All students are expected to participate in class by regularly attending lecture and labs, by preparing adequately for class (through assigned readings and deliberate practice work), and by actively participating in class discussions and activities.

Academic Integrity:

We will follow Articles 1-401 through 1-406 of the *Student Code* (beginning at http://studentcode.illinois.edu/article 1_part4_1-401.html). This rule defines infractions of academic integrity, which include but are not limited to cheating, fabrication, and plagiarism. You are responsible for following these guidelines. If you have any questions about whether something would be an infraction, consult with the instructor before proceeding.

In SE101, you will submit both individual and team assignments. While team assignments are understood to be the work of a team, individual assignments you submit ***must be your own work****.*

The instructional team periodically checks student work for various forms of academic dishonesty. This check is performed manually and also via automated similarity checkers. If academic dishonesty occurs, consequences may include:

- A zero on the entire assignment or exam in question
- Forwarding your name to the Office of the Dean of Students via FAIR (Faculty Academic Integrity Report)
- A lowered or failing grade in the course

Request for Special Accommodations:

University of Illinois and SE101 strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please discuss options with your instructor. You are also encouraged to contact the Disability Resources & Educational Services (DRES) Center (contact information below). If you are eligible for academic accommodations because you have a documented disability that will affect your work in this class and/or at an exam, please schedule an appointment with Professor Goldstein as soon as possible to discuss your needs. At these meetings, bring your "Letter of Accommodation" that you obtained from DRES so that I can make proper accommodations for you.

To obtain disability-related adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 Oak St., Champaign, call 217.333.4603, email disability@illinois.edu or go to the DRES website.

Please also schedule a private meeting with the course instructor to discuss your needs and requirements. All accommodations will try to be met once you self-identify. Please note accommodations are not retroactive to the beginning of the semester but begin the day you contact your professor with a current letter of accommodation from DRES.

Diversity Statement: UIUC is committed to equal opportunity for all persons, regardless of race, ethnicity, religion, sex, gender identity or expression, creed, age, ancestry, national origin, handicap, sexual orientation, political affiliation, marital status, developmental disability, or arrest or conviction record. We value diversity in all of its definitions, including who we are, how we think, and what we do. We cultivate an accessible, inclusive, and equitable culture where everyone can pursue their passions and reach their potential in an intellectually stimulating and respectful environment. We will continue to create an inclusive campus culture where different perspectives are respected and individuals feel valued.

Communication with the Teaching Team:

When communicating with members of your SE 101 teaching team, your email must originate from your Illinois email account and include:

- Your name
- SE 101 section number and team number (once teams are assigned)
- Topic (e.g. assignment name)
- A detailed description of your concern

Allow at least 24 hours for emails to be answered.

For professional communication, make sure your email is:

- appropriately addressed to the recipient (e.g., not “Hey,” but “Dear Professor”),
- includes a helpful subject line with SE101 & Section included (e.g., “SE101 ABC: Question about SA2”),
- written in complete sentences,
- specific (e.g., not “I have a question on the assignment” but “I have a question on part 2 of problem set 3”),
- concluded with an expression of appreciation for the reader’s time or help.

Material Copyrights

The SE 101 materials and their notes are copyrighted or derivatives of copyrighted materials and shall not be sold, bartered, or posted on sites such as Course Hero, Chegg, and Quizlet without express permission from your instructor and the Associate Head of ISE.

SE101B FUSION SCHEDULE, SPRING SEMESTER 2025

Week	Date	Topic	Readings	Lecture supplements	Studio: Sketching & Visualization	Pre-labs	Modeling	Design Project
1	20-Jan	1. Course introduction	Ch1 (19-20) Ch4 (65-74)					
		2. Geometric modeling, Parametric modeling/ sketching Projection theory (perspective)	Ch10 (276-286) Ch10 (287-303) Ch5 (79-85), Ch6 (126-135)	Geometric modeling Projection theory, part 1		Post-lab question	MA0: Intro to Fusion, sketch, revolve, and extrude	
2	27-Jan	3.. Projection theory (perspective)	Ch4 (65-74), Ch5 (79-85), Ch6 (126-135)	Projection theory, part 1	SA1: Freehand sketching			
		4. Reverse Engineering, HCD & Engineering	Ch14 (376), Ch3 (44-59), Ch2 (25-42)			Pre-lab #1	MA1: Part modeling	
3	3-Feb	5. Perspective sketching	Ch5(83-85), Ch6 (135-142)	1-pt perspective sketching, 2-pt perspective sketching videos	SA2: Perspective sketching			
		6. Working drawings; dimensions	Ch12 (329-333, 334-338), Ch9(248-249)			Pre-lab #2	MA2: Patterns and Drawings	
4	10-Feb	7. Oblique & isometric sketching	Ch5 (93-103)	iso to oblique sketching, oblique to iso sketching	SA3: Isometric & oblique sketching			Intro & Kick-off; Design teams established & topic selected by EOW
		8. Parallel projections, dimensions DP Guest in lecture	Ch5 (85-93)	Projection theory, part 2		Pre-lab #3	MA3: Modeling techniques	
5	17-Feb	9. Projection review; Teaming & Diversity	Ch5; Ch2 (22-23)	Review for Theory Test #1	Lab orientation			Products ordered/delivered
		10. Design tools & Advanced modeling;	Ch10 (297-303) Ch10 (296-297) Ch13 (357-366)	None		Pre-lab #4	MA4: Modeling techniques and 3D sketch	

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		Assembly Modeling; Additive Manufacturing **SQ1 on SA2**						
6	24-Feb	11. Review for theory test #1			Design Project Product dissection			Product dissection
		12. **Theory Test & SQ2 (on SA3)**				Pre-lab #5	MA5: Assembly	
7	3-Mar	13. Multiviews, Product definition: working drawings Guest Andy Block (Fiskars) in class	Ch7 (148-161) Ch12 (329-345)	Multiviews	SA4: Multiviews			
		14. Team DP time; problem scoping		None			Modeling midterm review	
8	10-Mar	15. Team DP time		None	Design review			Design Review 1 (in sketching), Interim Report 1 due EOW; CATME Peer Eval #1
		16. No lecture		None			**Modeling midterm exam**	
9	17-Mar	Spring Break!						
10	24-Mar	17. Visualization techniques	Ch7 (161-168)	Missing views	SA5: Missing views			
		18. Top-down assembly modeling. ~~Understanding the User & Product Improvement~~ **SQ3 (on SA4)**	Ch2 (25-42) Ch1 (19-20)	HCD Guide		Pre-lab #6	MA6: Top-down Assembly, Intro to freeform	
11 *(EOH week)*	31-Mar	19. Section views; Understanding the User & Product Improvement	Ch8 (202-214)	Section views videos	SA6: Section views			
		20. Top-down + freeform		None			No Lab - EOH	

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12	7-Apr	21. Auxiliary views	Ch8 (214-222)	Aux views	SA7: Aux Views			Design review 2 (in modeling); Interim Report 2 (after DR2) Submit 3D part for printing
		22. Concept generation; **SQ4 (on SA5)**	Ch15 (390-405)	None		Pre-lab #7	MA7 (top down assembly + freeform)	
13	14-Apr	23. Dimensions & tolerances	Ch9 (248-270)	Dimensioning & Tolerancing	SA8: Dimensioning & tolerancing			
		24. Gen design; analysis tools;	Ch15(390-405)			Pre-lab #8	MA8 (animation, motion study & rendering + Adobe spark)	
14	21-Apr	25. Review			Design Project			
		26. Theory Test #2 & SQ5 (on SA6 or 7)	Ch15 (390-405)	None		Pre-lab #9	MA9 (Generative Design & Stress Analysis)	
15	28-Apr	27. Design Project		None	Design Project		Design project	
		28. Design Project; class wrap-up, Q&A		None				
16	5-May	**Groups will present in sketching studio. Written Report, Modeling Files, and Final Peer Evaluations due Wednesday 5/1 by 5pm.**						