

SE101A BIM – Engineering Graphics and Design

Spring Semester 2024

Instructor: Prof. Molly Goldstein 309 Transportation 300-8169 mhg3@illinois.edu

Teaching assistants: Alfredo Guzman, Michaela Patton, Xiyitao Zhu

Class times and location: Lecture – Mondays and Wednesday, 10am-10:50am, 2310 Everitt Lab. Sketching lab and modeling lab – time as registered, 207 Transportation Bld and 4th floor Engineering Hall, respectively.

Prof. Goldstein Office hours and location: Wednesdays 11:30am-12:30pm 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 SE101A 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 Studio	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 rewarding.

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

*We highly recommend the electronic access option through Wiley: <https://www.wiley.com/en-us/shop/books> so that you can have access to all of the electronic resources. You can rent it for the semester for \$29.

Web: Illinois Canvas (canvas.illinois.edu)
[Autodesk Education Community](#)

[Revit Architecture 2023 Essential Training](https://web.uillinois.edu/linkedinlearning), Paul Aubin, LinkedIn Learning
[Revit Structure 2023 Essential Training](https://web.uillinois.edu/linkedinlearning), Eric Wing, LinkedIn Learning
<https://web.uillinois.edu/linkedinlearning>

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

Software: **Autodesk Revit (SE101A) – 2023 version**
Canvas. The SE101 teaching team will communicate with you primarily 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 building information modeling (BIM) software as a design, visualization, and information extraction tool. Emphasis placed upon learning BIM concepts and techniques.
4. To gain exposure to other BIM tools (e.g., for concept design, field work, analysis) commonly used in the building modeling process.
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 Penalties: All work turned in late will be penalized as follows:

For up to one week, 20% of the grade (4 points).

Beyond one week, 100% of the grade (20 points), i.e., will not be accepted

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.

Attendance Policy:

Your attendance at all scheduled classes (lecture, discussion and lab) is mandatory and essential for success in this course. However, circumstances occasionally occur where you may need to miss a class.

Planned absences: If you need to miss class for a religious observance, a Illinois athletic commitment, graduate school interview or some other legitimate reason, you must make arrangements to make up the missed work a minimum of one week before the absence occurs, otherwise, the absence will be unexcused and you will receive the standard 20% late penalty for work accepted up to one week late and 0 for any work after that date. Therefore, homework must be turned in early (before the deadline) if you will be absent on the day it is due.

Serious illness/Family emergency: If you are seriously ill or experiencing a family emergency and are unable to attend lab, inform your TA via email and copy Prof. Goldstein. If you need an extension on your homework due to a serious illness or family emergency, arrangements must be made with Prof. Goldstein BEFORE the homework due date.

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:

The Grainger College of Engineering 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. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, 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.

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.

Community of Care: As members of the Illinois community, we each have a responsibility to express care and concern for one another. If you come across a classmate whose behavior concerns you, whether in regards to their well-being or yours, we encourage you to refer this behavior to the Student Assistance Center (217-333-0050 or <http://odos.illinois.edu/community-of-care/referral/>). Based on your report, the staff in the Student Assistance Center reaches out to students to make sure they have the support they need to be healthy and safe.

Further, as a Community of Care, we want to support you in your overall wellness. We know that students sometimes face challenges that can impact academic performance (examples include mental health concerns, food insecurity, homelessness, personal emergencies). Should you find that you are managing such a challenge and that it is interfering with your coursework, you are encouraged to contact the Student Assistance Center (SAC) in the Office of the Dean of Students for support and referrals to campus and/or community resources.

Disruptive Behavior: Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office for Student Conflict

Resolution (<https://conflictresolution.illinois.edu>; conflictresolution@illinois.edu; 333-3680) for disciplinary action.

Emergency Response Recommendations: Emergency response recommendations and campus building floor plans can be found at the following website: <https://police.illinois.edu/em/run-hide-fight/>. I encourage you to review this website within the first 10 days of class.

Religious Observances: Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. Students should complete the [Request for Accommodation for Religious Observances](#) form should any instructors require an absence letter in order to manage the absence. In order to best facilitate planning and communication between students and faculty, students should make requests for absence letters as early as possible in the semester in which the request applies.

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: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.

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.

SE101A REVIT SCHEDULE, SPRING SEMESTER 2024

Week	Date	Topic	Readings	Lecture supplements	Studio: Sketching & Visualization	Pre-labs	Modeling	Design Project
1	15-Jan	1. MLK			No sketching			
		2. Course introduction; Intro to BIM	Ch1 (19-20) Ch10 (285, 286) BIM Handbook Ch1	Revit Videos		Post-lab question	BIMA0 Revit Quick Start	
2	22-Jan	3.. Projection theory (perspective)	Ch4 (65-74), Ch5 (79-85), Ch6 (126-135)	Projection theory, part 1	SA1: Freehand sketching			
		4. Levels, grids, foundations				Establishing Datums	BIMA1: Revit Foundations	
3	29-Jan	5. Perspective sketching	Ch5(83-85), Ch6 (135-142)	1-pt perspective sketching, 2-pt perspective sketching videos	SA2: Perspective sketching			
		6. Structures: Columns & beams, floors		Design project, lab orientation		Loading Beams	BIMA2: Superstructure	
4	5-Feb	7. Parallel projections; Oblique & isometric sketching	Ch5 (85-93) Ch5 (93-103)	Projection theory, part 2 iso to oblique sketching, oblique to iso sketching	SA3: Isometric & oblique sketching			Intro & Kick-off in modeling; Design teams established and building selection by EOW
		8. Walls, section views; Intro to parallel projections	Ch5 (85-93)			Wall Drawing Methods	BIMA3: Enclosure Part 1 (Conventional Walls)	
5	12-Feb	9. Projection review; Construction drawings	Ch5; Ch2 (22-23) Construction Drawings	Review for Theory Test #1 Download Everitt drawings	Continue Construction Drawings activity in sketching			Design Project Data Manage., Site Visits
		10. Teaming and Diversity SQ1 (on SA2)	Ch2 (22-23)			Curtain Wall Types	BIMA4: Enclosure Part 2 (Curtain Walls + Roofs)	

SE101A REVIT SCHEDULE, SPRING SEMESTER 2024

6	19-Feb	11. Review for theory test #1			Design Project			Finalize site visits
		12. Theory Test & SQ2 (on SA3)				Glass Door	BIMA5: Openings (Doors, windows, skylights, stairs)	
7	26-Feb	13. Multiviews,	Ch7 (148-161) Ch12 (329-345)	Multiviews	SA4: Multiviews			Modeling midterm review
		14. Team DP time; problem scoping		None				
8	4-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	11-Mar	Spring Break!						
10	18-Mar	17. Visualization techniques	Ch7 (161-168)	Missing views	SA5: Missing views			BIMA6: Rooms & Schedules
		18. Rooms, schedules <i>Introduce Sketchup</i> SQ3 (on SA4)				Elevator		
11	25-Mar	19. Section views	Ch8 (202-214)	Section views videos	SA6: Section views			BIMA7: Furnishing/ Interior Modeling
		20. Components, ceilings, views		None		Entourage		
12	1-Apr	21. Auxiliary views	Ch8 (214-222)	Aux views	SA7: Aux Views			Design review 2 (in modeling); Interim Report 2 (after DR2)

SE101A REVIT SCHEDULE, SPRING SEMESTER 2024

		22. Revit Collaboration SQ4 (on SA5)				Link up	BIMA8: Exterior Modeling	
13	8-Apr	23. Dimensions & tolerances	Ch9 (248-270)	Dimensioning & Tolerancing	SA8: Dimensioning & tolerancing			
		24. BIM analysis tools and DP				Practice Render	BIMA9: Presentation & Analysis	
14	15-Apr	25. Review			Design Project		Design project	Design project
		26. Theory Test #2 & SQ5 (on SA6 or 7)	Ch15 (390-405)	None			Design project	
15	22-Apr	27. Design Project		None	Design Project		Design project	
		28. Design Project; class wrap-up, Q&A		None				
16	29-Apr	Groups will present in sketching studio (or lecture for overflow). Written Report, Modeling Files, and Final Peer Evaluations due Wednesday 5/1 by 5pm.						