Course Syllabus

✎ Edit

ME1670 - Introduction to Engineering Graphics and Design

Introduction

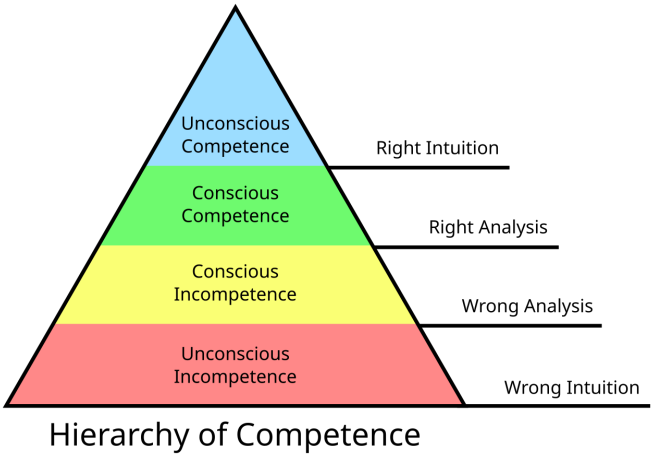
This course will introduce students to the engineering design process and foundational skills related to the development, communication, and documentation of design concepts.

Learning Outcomes

- Demonstrate an engineering mindset including:
  - Challenge assumptions and develop awareness of biases.
  - Communicate effectively, making credible arguments which are supported by evidence.
  - Build an effective team that can produce quality deliverables on time.
- Develop relevant design skills including:
  - Define a design problem, including relevant objectives and constraints.
  - Analyze shapes and deconstruct forms.
  - Visualize objects and design concepts.
  - Create orthographic, perspective, and pictorial 2D representations of 3D objects.
  - Create 3D solid models using SolidWorks and following industry best practices.
  - Apply an awareness of manufacturing process capabilities and limitations to inform design decisions.
  - Interpret and create technical drawings following established conventions.
  - Receive and incorporate critique and feedback from instructors and peers.

How you will be learning

- Active learning is primarily through assignments which are similar to puzzles. Students are assigned challenges which they may not be able to complete without help. Expert solutions are provided, which can be accessed at any time with no grade penalty.
- Students are expected to make mistakes, and to progress from unconscious incompetence (making incorrect choices) to at least the level of conscious competence (making the right decision when actively thinking about the best approach).
- This follows the **Four Stages of Competence** (https://en.wikipedia.org/wiki/Four_stages_of_competence) as established in education literature



Hierarchy of Competence

(graphic adapted from Noel Burch by Igor Kokcharov)

Instructor	**Marty Jacobson** SolidWorks Champion Certified SolidWorks Expert 
Contact Info:	marty@gatech.edu (mailto:marty@gatech.edu) @Marty Jacobson on MS Teams
TA	TBD
Lecture:	**Section A/A01:** Monday/Wednesday 11:00a-11:50a Lamar Allen Sustainable Education Building, SEB 121 **Section C/C01:** Tuesday/Thursday 9:30a-10:20a Lamar Allen Sustainable Education Building, SEB 121
Lab:	**Section A/A01:** Thursday 8:00a-10:45a Lamar Allen Sustainable Education Building, SEB 102 **Section C/C01:** Monday 8:00am-10:45am Lamar Allen Sustainable Education Building, SEB 102
Final Exam:	**In place of exam, a Team Presentation will be held during final exam period as published in the Final Exam matrix:** Final Exams | Registrar's Office | Georgia Tech (https://registrar.gatech.edu/academic-scheduling/exams) **Section A (M/W Lecture):** Friday, December 11, 11:20 AM - 2:10 PM **Section C (T/Th Lecture):** Monday, December 14, 8:00 AM - 10:50 AM Lamar Allen Sustainable Education Building, SEB 121
Office Hours:	**Held outside the Invention Studio/IDEA Lab on the 2nd floor of the MRDC** Tuesday 10:30am-noon Wednesday 9:30am-11am Thursday 2:00pm-3:30pm Book Office Hours with Marty here (https://outlook.office.com/bookwithme/user/4e17fe807be1477587c30a742a33a15c@gatech.edu?anonymous&ismsaljsauthenabled&ep=plink)

This course cannot be dropped. Due to the high demand for this required course, no student may drop or withdraw from this course.

Course Deliverables & Grading

Grades on Canvas at any point reflect the weighted average of all graded assignments. The final course grade reported to the registrar will match the grade you see in Canvas after all grades have been entered. If you believe any grading is in error or that a clerical error has been made in recording your grade, please contact the instructor before the end of the term to ensure you receive full credit earned on all assignments.

Grading Scale:

90-100 A
80-89 B
70-79 C
60-69 D
0-59 F

Grade Categories and Weights:

	Assignment	Weight	Due Date
Skill Building (40%)	Parametric CAD Core Concepts/ Orthographic & Isometric Drawing Competency	2	9/4
	Perspective Drawing Competency	8	10/16
	CSWA Phase 1	10	10/16
	CSWA Phase 2	15	11/13
	CSWA Certification Exam (or untimed Modeling Mastery Challenge)	5	12/8 (during Final Instructional Days)
Individual Project (30%)	Mechanical Contraption Proposal & Concepts	5	9/18
	Design for 3d Printing	10	10/9
	Engineering Drawings	5	10/30
	Report	10	11/20
Team Project (30%)	Topic Brainstorming	n/a	9/11
	Proposal Pitch Deck	3	9/25
	Individual Concept Development Sketches	4	10/23
	Brand DNA Analysis	3	10/23
	CAD	10	12/04
	Final Presentation	10	Final Exam Period

Course Supplies and Technological Requirements

All materials required for completion of this course are provided on Canvas. A reading list containing optional helpful design resources is published on Canvas, including the following optional reference books:

- *How to Draw*, 2013, Scott Robertson, ISBN 978-1933492735 (Optional)
- *Rapid Viz*, 2006, Kurt Hanks and Larry Belleson, 978-1598632682 (Optional)

The following are **required** for participation in this class every class period:

- Ballpoint pen (Bic stick or similar ballpoint, **not** a Pilot rollerball or gel pen)

The following are **not required**, but **necessary** for the best experience in this class:

- A Windows laptop capable of running SolidWorks Student Edition (16gb RAM, dedicated nVidia GPU such as RTX 3050 or above, 512GB SSD)
- A mouse with a clickable scroll wheel such as **this one** (https://www.amazon.com/Logitech-Wireless-Mouse-M190-Ambidextrous/dp/B087Z6P16M/ref=sr_1_10?crid=3ERMKGJ0GQXT7&keywords=logitech+mouse&qid=1652376602&sprefix=logitech+mouse%2Caps%2C106&sr=8-10) or **this one** (https://www.amazon.com/Logitech-Wireless-Computer-Unifying-Receiver/dp/B087Z5WDJ2/ref=sr_1_5?crid=3ERMKGJ0GQXT7&keywords=logitech+mouse&qid=1652376602&sprefix=logitech+mouse%2Caps%2C106&sr=8-5)
- An 8.5x11" tracing paper pad (32lb/50gsm) with at least 100 sheets such as **this one on Amazon** (https://www.amazon.com/Tracing-Translucent-Sketching-Preliminary-Overlaying/dp/B0CS69VTFW)

The following are **nice to have** for this class, but not required:

- **Black Ultra-fine Sharpie markers** (https://www.amazon.com/Sharpie-37161PP-Permanent-Markers-Resists/dp/B00144862U/ref=sr_1_1_pp?crid=G5K2IOIQQVFY&dib=eyJ2IjoiMSJ9.7Q4Y7Lxe5b0HMTJrW8O14RgYnU7dEhW5zDrOzWAaYH7sFtIFOcL53pi5rr0BqMbJwUSC1dCx4Ut3mKbT8Bb-GIlq5YrSImalc3fkHjJrTyxzM_txIXADJRKJS94XN7DwTyDY-cQQl-pQ5nRILDygVsKkQ8bRj-EaSqu9K5A69_BM4SSkNa7GOSGIvAZY_yrMybF2I9K4JCTx2LwymQzjszjDmddlUTMennEZhUW120jdgoPZ0cZtkoMbJr13ne5f_C5iwSTXnKLHBeoUN143erQvC9c1)
- **Black fine Sharpie markers** (https://www.amazon.com/Sharpie-Permanent-Marker-Point-Black/dp/B000I0TZO4/ref=sr_1_2_pp?crid=G5K2IOIQQVFY&dib=eyJ2IjoiMSJ9.7Q4Y7Lxe5b0HMTJrW8O14RgYnU7dEhW5zDrOzWAaYH7sFtIFOcL53pi5rr0BqMbJwUSC1dCx4Ut3mKbT8Bb-GIlq5YrSImalc3fkHjJrTyxzM_txIXADJRKJS94XN7DwTyDY-cQQl-pQ5nRILDygVsKkQ8bRj-EaSqu9K5A69_BM4SSkNa7GOSGIvAZY_yrMybF2I9K4JCTx2LwymQzjszjDmddlUTMennEZhUW120jdgoPZ0cZtkoMbJr13ne5f_C5iwSTXnKLHBeoUN143erQvC9c2)

Attendance Policy

- Attendance for all lectures and lab periods is mandatory and essential to student success in this course.
- Attendance will be taken using physical attendance sign-up sheets each class and lab period.
- Students are allowed 2 unexcused lecture absences and 1 unexcused lab absence without penalty. Each additional unexcused absence will result in an automatic 1% grade reduction.
- Students who are late by more than 5 minutes will be marked as Absent.
- Students who leave early may be marked as Absent, at the recording TA's or instructor's discretion.
- In the event that you are experiencing flu-like symptoms, documentation from a doctor or clinic is **not** required for an excused absence if students communicate via email before class time with the section graduate TA.
- Excused absences after the fact will require a doctor’s note or other standard officially recognized justification, such as that provided by the office of the Dean of Students.

Late Work

- Late work is accepted with an automatic penalty of 10% of the assignment value per week.

Emergency Extensions

- In the event of an emergency or situation outside the student's control, communicate with your instructor at the earliest possible opportunity to define a new due date for completion.
- Full credit for assignments turned in by the extended due date is possible in the event of a documented disruption to student participation supported by documentation such as a doctor's note or a letter from the office of the Dean of Students.

The Gold-Plated Late Submission Rule

- I value high-quality work and evidence of learning, even if you missed a due date.
- Late assignments submitted without arrangement before the due date may still be considered for grading at the instructor’s discretion. In order to be considered, submissions must be exceptional, demonstrate substantial effort and meeting the assignment’s standards for exemplary work. Get feedback from the instructor in lab or office hours before submitting late work to confirm the standard of superb work is met.
- Incomplete or low-effort late submissions will not be graded.
- No submissions (other than the final project presentation) will be accepted after Final Instructional Days (December 8th, 2026).

Flexibility Tokens

- Each student receives 2 individual tokens and each team receives 1 group token at the beginning of the semester.
- Individual tokens may only be used for individual assignments, and group tokens may only be used for team assignments.
- A token may be redeemed in one of two ways:
  1. Before an assignment is due in order to receive a 1 week extension (not counting school breaks or holidays) on any assignment. To claim a token, submit the comment "**Token 1: [new due date]**" or "**Token 2: [new due date]**" as appropriate to the assignment before the due date instead of submitting work.
  2. After an assignment is past due in order to receive the opportunity to re-submit the assignment for up to full credit. In this case, submit the comment **"Token 1: Regrade"** or **"Token 2: Regrade"** along with your re-submission.
- Due to Georgia Tech policy, the Final Presentation for the team project, which is held during the final exam period, is not eligible for Token usage.

NOTE: Tokens are NOT for use in the event of illness or emergencies. Tokens are for your personal flexibility and management of your own schedule. In the event of an emergency, simply inform your Grad TA of your need for an extension or regrade due to a disruption in your ability to participate and it will be

granted without using a Token.

Course Expectations & Guidelines

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit **http://www.catalog.gatech.edu/policies/honor-code/** (http://www.catalog.gatech.edu/policies/honor-code/) or **http://www.catalog.gatech.edu/rules/18/** (http://www.catalog.gatech.edu/rules/18/) .

Any student suspected of cheating or plagiarizing on an exam, assignment, or project will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Feel free to use the provided **TurnItIn Proofing assignment** (https://gatech.instructure.com/courses/541546/assignments/2527000) to ensure that all reports receive a clean TurnItIn score prior to submission.

Collaboration is permitted and encouraged. However, the work you turn in must be the results of your own effort and reflect your understanding of the material. SolidWorks files will be submitted to graded assignments as evidence of originality. Embedded metadata document the creator's name, time, date, and history of every unique feature used in the file.

Policy on Use of Generative Artificial Intelligence:

- ME1670 students should use AI tools responsibly and with transparency, documenting where and how they were used.
- You are responsible for all assignments and other work you submit, or submitted on behalf of yourself by a teammate.
- Work submitted should be your own, and any AI tools or assistance used for work in the course should be clearly acknowledged and disclosed.
- Any content (text, figures, design concepts, etc.) generated/created by or with the assistance of AI tools should be cited just as it would be when incorporating, quoting, or summarizing any other content, images, etc. that are not your own.
- Treat LLM output like any web source and cite it appropriately. Just as you would not copy-paste an entire paragraph into your paper from a Web source, you may not copy generated text directly into your paper and imply authorship of it.
- Verify facts with authoritative references and cite those, not the LLM.
- **Unacceptable use of LLM's include:**
  - Copy-pasting blocks of LLM text into your report or slides.
  - Using LLMs to generate data, citations, specifications, or test results.
  - Presenting LLM output as authoritative without independent verification.
  - Asking LLMs to write your analysis or conclusions for you, even if it is accurate to your team's process and opinions.

This policy has been adapted from 'Requirements for Developing Generative AI Tool Policies in WCP Courses', available at: **https://sites.gatech.edu/bfhandbook/requirements-for-developing-generative-ai-tool-policies-in-wcp-courses** (https://sites.gatech.edu/bfhandbook/requirements-for-developing-generative-ai-tool-policies-in-wcp-courses)

Team Project Contributions

It is an academic integrity violation to give a team member credit for work to which they have not meaningfully contributed.

If a student fails to reliably contribute to the team project, this will be evident in peer evaluations as well as team meeting minutes which are submitted as part of the final team project submission. As a result, a student who does not reliably contribute to the team project may not be permitted to present in the final presentation and will not receive full credit for team deliverables to which they did not substantially contribute.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404) 894-2563 or **http://disabilityservices.gatech.edu/** (http://disabilityservices.gatech.edu/) , as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail the instructor as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See **http://www.catalog.gatech.edu/rules/22/** (http://www.catalog.gatech.edu/rules/22/) for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek.

Midterm Evaluation

In accordance with Georgia Tech policy for 1000 and 2000-level courses, midterm grades (Satisfactory/Unsatisfactory) will be issued to the Registrar. Students who have multiple unexcused absences, multiple missed assignments, or who have earned a 70% or lower average on assignments will be reported as Unsatisfactory.

Course Summary:

Date	Details	Due
Fri Sep 4, 2026	Crankadillio Assembly (https://gatech.instructure.com/courses/541546/assignments/2526920)	due by 11:59pm
	Drawing Interpretation Exercises (https://gatech.instructure.com/courses/541546/assignments/2526898)	due by 11:59pm
	Hand Orthographic & Isometric Drawings (https://gatech.instructure.com/courses/541546/assignments/2526974)	due by 11:59pm
	Orthographic & Isometric Mechanical Drafting in SolidWorks (https://gatech.instructure.com/courses/541546/assignments/2526926)	due by 11:59pm
	Parametric CAD Core Concepts Module Completion Grade (https://gatech.instructure.com/courses/541546/assignments/2526988)	due by 11:59pm
Fri Sep 11, 2026	Sketch Exercise: Fully Defining Patterns (https://gatech.instructure.com/courses/541546/assignments/2526942)	due by 11:59pm
	Troubleshooting Sketches (https://gatech.instructure.com/courses/541546/assignments/2526910)	due by 11:59pm
Fri Sep 18, 2026	Extrudes Warm-Up (https://gatech.instructure.com/courses/541546/assignments/2526912)	due by 11:59pm
	Mechanical Contraption - Project Proposal and Concept Sketches (https://gatech.instructure.com/courses/541546/assignments/2526982)	due by 11:59pm
Fri Sep 25, 2026	Dream Internship - Brand Expansion Pitch Deck (https://gatech.instructure.com/courses/541546/assignments/2526970)	due by 11:59pm
Fri Oct 2, 2026	Extruded Solids (Ribbon, Tank) (https://gatech.instructure.com/courses/541546/assignments/2526924)	due by 11:59pm
	Revolved Solids - (Hex Key, Screw Bit) (https://gatech.instructure.com/courses/541546/assignments/2526936)	due by 11:59pm
Fri Oct 9, 2026	3D Printing Project - CAD Submission (https://gatech.instructure.com/courses/541546/assignments/2526956)	due by 11:59pm
	CSWA8: Variables & Configurations (https://gatech.instructure.com/courses/541546/assignments/2526916)	due by 11:59pm
	CSWA9 - Don't Forget the Equals Sign Or the Quotation Marks (https://gatech.instructure.com/courses/541546/assignments/2526896)	due by 11:59pm
Fri Oct 16, 2026	CSWA Assembly Practice (https://gatech.instructure.com/courses/541546/assignments/2526908)	due by 11:59pm
	CSWA Phase 1/SolidWorks Modeling Basics Completion Grade (https://gatech.instructure.com/courses/541546/assignments/2526964)	due by 11:59pm
	CSWA10: Platonic Solids (https://gatech.instructure.com/courses/541546/assignments/2526940)	due by 11:59pm
	CSWA12: Multi-Body Modeling (https://gatech.instructure.com/courses/541546/assignments/2526902)	due by 11:59pm

Date	Details	Due
	Perspective Drawing (https://gatech.instructure.com/courses/541546/assignments/2526990)	due by 11:59pm
Fri Oct 23, 2026	Brand DNA Analysis & Embodiment (https://gatech.instructure.com/courses/541546/assignments/2526962)	due by 11:59pm
	Individual Concept Sketches (https://gatech.instructure.com/courses/541546/assignments/2554872)	due by 11:59pm
Fri Oct 30, 2026	3D Printing Project - Engineering Drawings (https://gatech.instructure.com/courses/541546/assignments/2526958)	due by 11:59pm
	CSWA13 Exercise: Daisy Cylinders (https://gatech.instructure.com/courses/541546/assignments/2526918)	due by 11:59pm
	CSWA14: Lid and Cap Challenge (https://gatech.instructure.com/courses/541546/assignments/2526914)	due by 11:59pm
Fri Nov 13, 2026	CSWA Phase 2/CSWP Prep Module Completion Grade (https://gatech.instructure.com/courses/541546/assignments/2526966)	due by 11:59pm
	CSWA24: Refining a Mechanical Design (https://gatech.instructure.com/courses/541546/assignments/2526944)	due by 11:59pm
	CSWA26: Drawing Tools Quiz (https://gatech.instructure.com/courses/541546/assignments/2526930)	due by 11:59pm
	CSWP8: Loft and Sweep Practice (https://gatech.instructure.com/courses/541546/assignments/2526906)	due by 11:59pm
Fri Nov 20, 2026	3D Printing Project - Report (https://gatech.instructure.com/courses/541546/assignments/2526960)	due by 11:59pm
Fri Dec 4, 2026	Team Project - Individual Part CAD & Engineering Drawings (https://gatech.instructure.com/courses/541546/assignments/2526996)	due by 11:59pm
Tue Dec 8, 2026	CSWA/CSWP Exam (https://gatech.instructure.com/courses/541546/assignments/2526968)	due by 11:59pm
	OPTIONAL CSWA Make-Up Assignment - Mechanical Option A (https://gatech.instructure.com/courses/541546/assignments/2526984)	due by 11:59pm
	OPTIONAL CSWA Make-Up Assignment - Sculptural Form Option B (https://gatech.instructure.com/courses/541546/assignments/2526986)	due by 11:59pm
	bottle with threads (https://gatech.instructure.com/courses/541546/assignments/2527002)	
	CSWA13: Daisy Cylinders Solution (https://gatech.instructure.com/courses/541546/assignments/2526946)	
	CSWA24 Solution (https://gatech.instructure.com/courses/541546/assignments/2526948)	
	CSWA9 - Solution (https://gatech.instructure.com/courses/541546/assignments/2526950)	
	CSWP Essential Prep 1: Direct Modeling (https://gatech.instructure.com/courses/541546/assignments/2526938)	

Date	Details	Due
	CSWP Essential Prep 2: That One Part (https://gatech.instructure.com/courses/541546/assignments/2526932)	
	CSWP Essential Prep 3: That Green Part (https://gatech.instructure.com/courses/541546/assignments/2526904)	
	CSWP Prep 3 Solution (https://gatech.instructure.com/courses/541546/assignments/2526952)	
	CSWP5: 3d Sketching Practice (https://gatech.instructure.com/courses/541546/assignments/2526928)	
	CSWP6: Cavity/Core Exercise (https://gatech.instructure.com/courses/541546/assignments/2526900)	
	Extrudes Warm-Up Solution (https://gatech.instructure.com/courses/541546/assignments/2526954)	
	Group Token (https://gatech.instructure.com/courses/541546/assignments/2526972)	
	Individual Token 1 (https://gatech.instructure.com/courses/541546/assignments/2526976)	
	Individual Token 2 (https://gatech.instructure.com/courses/541546/assignments/2526978)	
	Roll Call Attendance (https://gatech.instructure.com/courses/541546/assignments/2526992)	
	SW Wizard: Chains in Assembly (https://gatech.instructure.com/courses/541546/assignments/2526934)	
	SW Wizard: Weird Flex, But OK (https://gatech.instructure.com/courses/541546/assignments/2526922)	
	Team Charter (https://gatech.instructure.com/courses/541546/assignments/2526994)	
	Team Project - Presentation & Final Design Documentation (https://gatech.instructure.com/courses/541546/assignments/2526998)	
	TurnItIn Proofing (https://gatech.instructure.com/courses/541546/assignments/2527000)	