

# ID 4106/6506: Parametric Product Modeling

**Term:** Fall 2025

**Sections:** 4106-1 & 6506-1

**Credit Hours:** 3 Hours

**Location:** 358, West Architecture Building

**Time:** Friday 11:00 am - 1:45 pm

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## Instructor Information

Name	Email	Office Hours & Location
Kevin Brown <i>Lecturer</i>	kbrown89@gatech.edu	Thursday, 11:00 am - Noon Grad Studio (Part-Time Faculty Space)

Meetings and office hours are available in-person or virtually to suit your comfort and needs. Please email to schedule.

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## Course Overview

### Welcome to Parametric Product Modeling!

This course explores advanced digital methods in product modeling for visual analysis, flexible design, and digital fabrication. Using SolidWorks and Fusion 360, students will develop an understanding of parametric design systems and how to embed flexibility, logic, and configurability into CAD models.

Students will use digital modeling as a tool to explore design variation, manufacturability, and mass customization strategies. Projects will culminate in fabrication and presentation of parametric product prototypes.

**Pre- and/or Co-Requisites:** Proficiency in SolidWorks and/or Fusion 360 is highly encouraged.

## **Course Goals & Learning Outcomes**

By the end of this course, you'll be able to:

- Model products with embedded flexibility using parametric tools in SolidWorks and Fusion 360.
- Plan and execute constraint-based CAD models through sketches, layouts, and design tables
- Apply parametric thinking to drive design variation and customization.
- Use the Computational Concept Canvas as a concept development tool.
- Integrate digital fabrication methods with parametric modeling to produce prototypes.

## **Course Format**

This course is a 3-credit lecture course that occurs once per week for a total of approximately three hours of in-class time. While officially designated as a lecture, the course will include lectures, guided work demonstrations, hands-on exercises, and in-class work days.

Students are expected to:

- Attend and participate in both weekly class sessions.
- Engage actively in in-class activities and discussions.
- Spend up to an additional 6 hours per week outside of class completing assignments, preparing for critiques, and developing project work.

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## Grading Policy

Component	Weight
Intro to Parametrics (Exercises 1-6)	25%
Project 1 - Parametric Phone Case	25%
Project 2 - Parametric Seating	40%
Attendance & Participation	10%
Extra Credit	5%
<b>Total</b>	105%

### Grading Scale

Your final grade will be assigned as a letter grade according to the following scale:

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

### Grading Notes

- There will be 6 graded **exercises**. These will reinforce lecture content and develop technical skills.
- You will complete 2 major **projects**, each building on prior knowledge and progressively increasing in complexity.
- **Attendance and participation** are required during both lectures and workdays.
- You will have the opportunity to earn up to **5 extra credit points** that will be applied to your overall grade.

Each assignment and exercise will be accompanied by detailed rubrics and feedback through Canvas.

### Submission Requirements

All files must be submitted electronically via Canvas. If required, compress multiple files into a single **.zip** file. For assignments requiring a PDF, submit the PDF as a separate file so it's easier to review.

If Canvas is unavailable at the time of submission, you may use the College of Design course folder system as a backup. A submission tutorial video will be available in the Media Gallery.

### Late Work Policy

- **Exercises & Projects:** Exercises & Projects lose **10% per calendar day** if submitted late. These are designed to build on each other, so staying current is important.

*For example, turning in an Exercise a week late means 70% off your grade for that assignment.*

- **Emergencies and Illnesses:** If you're facing challenges, illness, emergencies, or anything else that might affect your ability to keep up, please reach out to me as soon as possible. I'm happy to work with you when I know what's going on. Open communication is key to being successful in this course.
- **Accessibility and Accommodations:** Georgia Tech is committed to providing an inclusive learning environment for all students. If you are registered with the **Office of Disability Services (ODS)** and require accommodations, please share your accommodation letter with me as early in the semester as possible. I will work with you to ensure your access needs are met. For more information or to request accommodations, visit [disabilityservices.gatech.edu](http://disabilityservices.gatech.edu).

### Exercise Resubmissions

This course is focused on skill development. To support this goal, you may resubmit any of the Intro to **Parametric Exercises (1–6)** once for regrading. Some of the techniques covered are advanced, and we want to ensure that you have a solid understanding of the material.

Resubmissions are an opportunity to demonstrate skill mastery. However, **please note that any late penalties from the original submission will still apply to the resubmitted work.**

## Extra Credit

**Research Participation:** Volunteer as a participant in an approved on-campus research project to earn **5 extra credit points**. To receive credit, you must complete the Research Participant Form available on Canvas and obtain a signature from one of the study investigators confirming your participation.

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## Attendance and Participation Policy

Attendance and participation make up **10% of your final grade** in this course. Being present and engaged will be imperative to your success in this class. Your attendance will be tracked every class.

- Excused Absences: Absences will be considered excused for the following reasons:
  - Personal illness
  - Family or personal emergencies
  - Institute approved events (such as athletic events or academic conferences)

At the end of the day communication is key. If you need to miss class for any of these reasons, please let me know as early as you can. I'm happy to work with you! Clear communication helps me support you and keeps things running smoothly for everyone.

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## Course Resources

### Course Text

*Computational by Design*, Viktor Malakuczi (2019)

[https://galileo-gatech.primo.exlibrisgroup.com/permalink/01GALI\\_GIT/18jodvt/alma9914920148102947](https://galileo-gatech.primo.exlibrisgroup.com/permalink/01GALI_GIT/18jodvt/alma9914920148102947)

### Additional Resources:

*Paramatrix: Best Practices in Parametric Modeling*, Deepak Selvaraj (2016) P

*Shaping Things*, Bruce Sterling (2005, The MIT Press)

*Elements of Parametric Design*, Robert Woodbury (2010, Routledge)

*Make: Design for CNC*, Anne Filson, Gary Rohrbacher, Anna Kaziunas France (2018, Make Media, Inc.)

### Course Website & Communication

All course information, including the syllabus, assignment details, lab exercises, grades, and announcements, will be available through **Canvas**. You'll also use Canvas to submit all assignments and lab exercises electronically.

Additionally, we will utilize Microsoft Teams to record class lectures and to meet online in the event of modified operations.

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## Course Expectations & Guidelines

### Academic Integrity

Georgia Tech aims to cultivate a community built on trust, academic integrity, and honor. Students are expected to uphold the highest standards of ethical behavior. For more information, please review Georgia Tech's [Academic Honor Code](#) and [Student Code of Conduct](#).

Any instance of cheating or plagiarism will be reported to the **Office of Student Integrity** for review and appropriate action.

### Use of Generative AI Tools in Industrial Design

You may use generative AI tools (e.g. ChatGPT, Midjourney, Photoshop, etc.) to support brainstorming, ideation, and early-stage exploration in your design process. These tools can be useful for sparking ideas, generating visual references, or exploring alternate approaches, but **they should not replace your own creative thinking, design skills, or authorship.**

Please keep in mind:

- AI-generated content can be inaccurate, biased, generic, or misleading. It should never be relied upon as a sole source for technical, conceptual, or design decisions.
- Your work must reflect your own thinking and process. AI-generated outputs (text, images, code, etc.) cannot be submitted as-is and passed off as original work. Doing so violates the Georgia Tech Honor Code.
- AI tools may be used as a part of your process, but not as a substitute for doing the work yourself, especially when it comes to sketching, modeling, rendering, and iteration.

If you choose to use generative AI tools:

- You must clearly document where and how you used them in your process.
- Include the platform used, tools or prompt(s) you entered, and a short explanation of how the output influenced your work.
- AI-generated content (text, images, code, etc.) should be cited like any external source.

*Example: "I used ChatGPT to help brainstorm three possible use cases for my lighting system. Prompt: 'Give me three ways a modular lighting product could be used in educational settings.'"*

Industrial Design is a hands-on, process-driven discipline. Your ability to think critically, iterate, and create original work is central to your success. AI may assist your thinking, but it cannot replace it.

## Accommodations for Individuals with Disabilities

If you require accommodations due to a documented disability, contact the **Office of Disability Services** at (404) 894-2563 or visit [disabilityservices.gatech.edu](https://disabilityservices.gatech.edu). Once you receive your accommodations letter, please email me as soon as possible so we can arrange the necessary support.

## Additional Student Resources

If you're experiencing challenges that impact your well-being or academic performance, Georgia Tech offers several resources that can help:

- [Center for Mental Health Care & Resources](#): Offers counseling, mental health support, and wellness services. Both in-person and virtual appointments are available.
- [Stamps Health Services](#): Provides medical care, health education, and prevention services to support your physical well-being.
- [Dean of Students Office](#): Assists with personal or academic concerns, emergency situations, and access to campus support systems.
- [Division of Student Life](#): Connects students to programs and services that promote well-being, engagement, and success.

If you're unsure where to start, the **Dean of Students** is a good first point of contact. They can help guide you to the right support.

## Modified Operations Policy

In the event of campus closures, instructional space issues, or modified operations, students should expect some course elements to move online. Follow updates from your instructor on Canvas and refer to the Digital Learning Days Policy for more information.

## Student-Faculty Expectations

At Georgia Tech, we value a culture of mutual respect between faculty and students. You can expect me to be prepared, responsive, and committed to your learning. In return, I expect professionalism, curiosity, and engagement from you. For a full list of expectations, visit the [Student-Faculty Expectations policy](#).