ME 6222 B/Q – Design, Materials, and Manufacture

Course Syllabus

George W. Woodruff School of Mechanical Engineering

Georgia Institute of Technology

Fall 2026

Course Description

This course provides students with an integrated treatment of the analysis of traditional and non-traditional manufacturing processes, their selection, and planning within an economic framework.

Course Objectives / Learning Outcomes

The objective of this course is to provide students with an integrated treatment of manufacturing processes, including process analysis, materials considerations, selection and planning of processes, and associated economic considerations.

Course Information

Instructor: Prof. Tequila A. L. Harris
Office: GTMI (MARC) 436
Phone: 404-385-6335
Email: tharris3@gatech.edu
Office Hours: 11:00 a.m.–12:00 p.m. on Mondays or by appointment

Course Website and Instructional Mode

All course materials will be posted on Canvas at http://canvas.gatech.edu. Homework assignments and solutions, class handouts, and other course-related postings will be available there. Content of classroom discussions may not appear on Canvas postings.

The teaching, testing, and examination mode will be live, in-person, on campus. All students will have access to videos of lectures. Off-campus students should review the distance learning guidelines for tests and examinations.

Classes may not be recorded by students without the express consent of the instructor unless pursuant to accommodation granted by the Office of Disability Services. Class recordings and materials posted on Canvas are for the sole purpose of educating students currently enrolled in the course and may not be shared.

Required Course Materials

Lecture notes and course readings will be available on Canvas. Review Canvas before purchasing books.

Optional references include:

Manufacturing Processes for Engineering Materials, Serope Kalpakjian and Steven R. Schmid, 6th edition, Pearson Prentice Hall, 2017 (older editions acceptable).

Manufacturing Processes and Equipment, G. Tlusty, Prentice Hall, 2000.

Materials Selection in Mechanical Design, Michael F. Ashby, 4th edition, Butterworth-Heinemann, 2011 (available as an e-book through the GT Library).

Materials developed by Prof. J. Colton, Version 7.

Potential Software

Granta software is available on the OIT website for Windows. Mac users must use the virtual lab via https://mycloud.gatech.edu. Open ME-2025.

Grading Policy and Weighting

Final grades will be determined using the following weights:

Homework: 20%
Exam 1 – 15%
Exam 2 – 15%
Exam 3 – 15%
Final Exam – 35%

Final letter grades are assigned as follows:
90 and above = A
80–89 = B
70–79 = C
60–69 = D
59 and below = F

The instructor may shift grade cutoffs downward depending on overall class performance, but no other grading scale is guaranteed.

Homework Policies

Homework may be completed in groups of no more than three students unless otherwise stated. One submission per group is required, with all group members listed, and all members will receive the same grade. Each group member is responsible for understanding all submitted material.

Homework must be submitted through Canvas. Scans of handwritten work are acceptable if clearly legible.

Late homework will not be accepted, though early submission is permitted. Homework may include material covered during the week preceding exams.

Each homework problem is graded on a 0–3 scale:
3 – Correct solution and answer
2 – Close attempt
1 – Attempt made but incomplete or incorrect
0 – No meaningful attempt

Off-campus students (Section Q) receive a three-calendar-day grace period beyond the on-campus due date.

Exams and Assessment Policies

All exams are closed book. For Exams 1–3, one handwritten 8.5 x 11 inch note sheet (front and back) is permitted. For the final exam, four handwritten sheets (front and back) are permitted. Note sheets must be turned in with the exam and may not be reduced in size.

Exams will not be given early or late. Absence without prior instructor approval results in a zero. Personal travel does not constitute an acceptable excuse.

Cell phones are not permitted during exams. Scientific calculators without internet capability are allowed.

Off-campus students (Section Q) have a one-week testing window and must complete exams using HonorLock through Canvas.

Exam dates may change in the event of a Georgia Tech closure due to weather or other emergencies.

Optional Projects

Students may complete one of two optional group projects for extra credit. Groups of 4–6 students may either:
Create a video documenting a manufacturing process and upload it to YouTube, or
Create a mock or mini manufacturing system or application demonstrating a manufacturing process, supported by at least three analyses demonstrating feasibility.

Additional details will be provided later in the semester. Attendance on the final project presentation day is mandatory for students in Section B, students in Section Q will be encouraged to attend remotely, if possible.

Attendance Policy

Students are expected to attend all class meetings, exams, and required activities. Attendance and engagement are essential for successful completion of the course.

Additional Criteria for Successful Completion of the Course

Students must complete all required homework, exams, and assessments, adhere to submission policies, and meet professional and academic standards throughout the course.

Academic Honesty / Academic Integrity

By participating in this course, students agree to adhere to the Georgia Tech Academic Honor Code. All acts of cheating will be reported to the Dean of Students. The use of external agents or paid services, including Chegg and AI-based tools such as ChatGPT, is expressly prohibited unless explicitly authorized.

Acceptable Student Conduct

Students are expected to comply with Georgia Tech Honor Codes and Student Expectations. Unauthorized recording of lectures or use of electronic devices beyond note-taking or in-class activities may result in dismissal from lecture.

Disability Services Statement

Georgia Tech provides reasonable accommodations through the Office of Disability Services. Students requiring accommodations should contact that office and inform the instructor as early as possible.

Student Support Services

The CARE Center, Counseling Center, Stamps Health Services, and the Dean of Students Office provide in-person and virtual support services. Additional resources are available via the GT Student Resources tab in Canvas.