BMED4813-A Syllabus

Clinical Observational Design Experience, 3 credits

Fall 2026

Instructor Information

Instructor: Jeremy Ackerman, MD, PhD

Email: jackerman31@gatech.edu

General Course Information

Description

Design engineers must effectively interface and communicate with medical professionals and have experienced in clinical working environments. This includes knowledge of hospital protocols, interacting with clinicians, surgeons, nurses and medical technical staff. Course content will focus on: hospital & surgical protocols, physician, surgeon, nursing and technical support functions, medical terminology, ethnology research on how to observe and gather information in the clinical setting and HIPPA requirements for protection of patient confidentiality and information. It is also essential to effectively build professional trust in order to define user requirements, verify engineering design requirements, and obtain user feedback for design validation.

In addition to 3 hours per week of class time and time needed to complete assignments, students are expected to spend 6-8 hours per week observing in active Emergency Departments in order to find problems that need to be addressed, refine the understanding of the problem, and then critically evaluate a proposed solution.

Course Learning Outcomes

Upon successful completion of this course, you should be able to:

- Observe independently in a clinical setting to gain information to inform design
- Identify, define, and understand clinically relevant problems based on observing and use of medical literature
- Develop a strategy for focused data gathering to further refine your understanding of a problem or validate assumptions made in design.

Required Course Materials

Bound observation notebook

Navy blue lab coat

Required reading:

- Privitera, M. B., & Alden, T. (2015). Contextual inquiry for medical device design / (First edition.). Academic Press. Available online for free through the Georgia Tech Library
- Additional readings provided via Canvas

Grading Policy:

Grade assignments will be made as follows:

Grade	Cut-Off
A	100-85 pts
B	84.99-75 pts
C	74.99-65 pts
D	64.99-55 pts
F	Below 55 pts

To account for variation in student performance due to more or less observation time from semester to semester, , the teaching team may add up to a 3 point blanket increase to final grades at the end of the term. This adjustment may be implemented if the teaching team determines that the final grades do not accurately reflect the overall effort and engagement demonstrated by the entire class.

Major assignments (Assignment #1, #2, #3, Clinical Case Write-up, Visual Storytelling and Tell Me a Story) will be graded by the course instructor using a rubric to provide both grades and feedback. Other assignments will be graded by the TAs or the instructor.

Assignments #1, #2, and #3 are group assignments and, except in rare instances, the entire group will receive the same grade. Additional pre-assignments for Assignment #1, #2, and #3 provide students with an opportunity to gain feedback on their work in progress before submitting their final project and are grade on completion only.

Credit towards your grade will be assigned based on the following distribution:

Assignment	**Weight**
Reading Quiz	5 pts
Notebook Checks	15 pts (3 x 5 pts each)
Tell Me A Story	5 pts
Credentialing	2 pts
Pre-Assignment #1: The Built-In Environment Problem Statement	2 pts
Assignment #1 Paper: The Built-In Environment	10 pts
Pre-Assignment #2: Processes Problem Statement	2 pts
Assignment #2 Paper: Processes	10 pts
Pre-Assignment #3: Pick a Device Problem Statement	2 pts
Assignment #3 Paper: Pick a Device	12 pts
Visual Storytelling	10 pts
Clinical Case Write-Up	15 pts
Attendance Checks	5 pts (5 x 1 pt each)
Course Evaluation	5 pts
TOTAL	100 pts

Description of Graded Components

1. Reading Quiz

A brief quiz completed on canvas to check that you have read the required readings.

2. Notebook Checks

Notebooks will be collected in-class and reviewed by Tas to assure that you have completed an appropriate number of clinical observations and that your notebook adheres to appropriate standards.

3. Tell Me A Story

After an in-class introduction to storytelling, students will provide a narrative describing an experience in a healthcare setting.

4. Credentialing

Completing the hospital credentialing on time will result in full credit. Failure to complete your pieces of this process on time will result in no credit.

5. Design Assignments and Pre-Assignment Problem Statements

There are three design assignments in this course. In these assignments, teams are asked to identify a problem they have seen while observing and develop a deeper understanding of the problem through further observation and through use of the literature. Early in the assignment cycle each student will submit a problem statement relevant to the assignment topic. Each team will select a problem and complete an (ungraded) in-class presentation describing the problem, their observations, and the literature, as well as an initial proposed solution. The graded written assignment will build on the initial work and feedback given to the team.

The three assignments are based on problems found related to #1 – the built environment, #2 – process, and #3 – devices.

6. Visual Storytelling

In this assignment students will use visual media to communicate and share their understanding of a problem they have been working on

7. Clinical Case Write-Up

In this assignment students will identify a patient and use their interactions with the patient and the patient's care team to inform 4 components. They will provide a formal patient write-up – similar to what a medical student would complete, they will tell the story of the patient's emergency department visit in narrative form, they will discuss how a problem they worked on impacted or could have impacted their patient, and they will review the literature to provide a description of the patient's medical condition as well as most the most recent updates in the clinical understanding or care of that condition.

8. Attendance Checks

At unannounced times, attendance will be taken.

9. Course Evaluation

Students completing the Canvas-based course evaluation will receive full credit. Students are of course encourage to also complete the CIOS course evaluation.

Course Policies

Attendance and/or Participation

Attendance to all scheduled classes is mandatory unless they have requested an excused absence and will be checked with sporadic attendance checks. Requested absences will usually be granted although students will always be responsible for any material missed, including instructions about how to complete assignments. If group presentations or work time will be missed students are expected to ensure that they have met the needs and expectations of their group despite their absence. Absences for illness or personal emergencies will usually be granted as long as reasonably prompt notification is made.

Scheduled clinical observation time can be missed with notification but students are expected to reschedule and make-up missed observation times.

If there are significant events impacting many students, specific class sessions may be made optional.

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. Review Georgia Tech's Honor Code and the student Code of Conduct.

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

Core IMPACTS

Core IMPACTS is the University System of Georgia's General Education curriculum. If you are teaching a course that counts towards Core IMPACTS, you should include a syllabus statement about the Core area and associated career competencies. This resource developed by the Center for Excellence in Teaching and Learning and Online Education at Georgia State University includes template syllabus statements for each of the Core IMPACTS areas that you may adapt for your course.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me 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. The Student-Faculty Expectations articulate some basic expectations 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. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Hospital Credentialing

Hospital credentialing is required to participate in this course. Credentialing will include a criminal background check, drug use screening, completion of several training modules, and submitting vaccination status (including completing vaccinations required by the hospitals). Failure to complete these requirements in a timely fashion will result in removal from the course.

Behavior While Observing

Access to hospital environments is a unique feature of this course and a privilege. Failure to adhere to standards of behavior in the hospital including inappropriate clothing, failure to respect privacy, or any behavioral concern brought by hospital staff may result in removal from the course.

Office Hours

Instructor office hours will be held on most class days for the hour before and the hour after scheduled class time. TA office hours will be scheduled as needed and additional office hours can be scheduled with the instructor. Participation in office hours provides an extra opportunity to gain insights that will help you succeed in this course. Many students come to office hours to discuss career plans. The time and location of office hours has not varied and you are welcome to attend office hours even after you complete the course.

Pre- or Co-Requisites

BMED 2310 (Intro to Biomedical Engineering Design) and BMED 3100 (Physiology) are listed pre-requisites for this course. Non-BME students and BME students who have not completed these courses may be granted permits on request.

Collaboration, Group Work, and Use of Generative AI

Use of AI-based assistance, such as ChatGPT and Github Copilot, should be treated in this course the same way you would use an external information source or reference. All work you submit must be your own. You should never include in your assignment anything that was not written directly by you without proper citation – including quoting directly used text and an

appropriate reference. Because AI models lack the experience and context of the settings you will be observing their inferences are frequently flawed and caution in their use is advised. Use of AI in literature reviews may be helpful as a starting point but verification of primary sources is essential to avoid hallucinations and misinterpretations common in large language models.

AI should not be used for the narrative assignments nor for the visual story telling assignment.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

Late assignments will be accepted until reading week with a late penalty of 20%. You will likely need to alert the instructor if you have turned in a late assignment if grading has already been completed.

Recording Class Activities

Recording class activities is generally not permitted as private patient information and sensitive information may be discussed which should not be disclosed outside of course participants.

Campus Resources for Students

Assistance with Writing and Communication

Clear writing and verbal communication is an essential skill in this class and in professional life. Georgia Tech's Naugle Writing and Communication Center offers a variety of services including individual and group consultations to enhance your skills and improve the documents and presentations you are producing.

Undergraduate Student Academic Success Resources:

- Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for your courses. Students can attend scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at Clough Undergraduate Learning Commons, Suite 283.

Student Well-Being:

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu)