

AI-Driven Medical Education Tool

Team Members and Roles:

Team Member	Primary Technical Role	Secondary Administrative Role
Tanner Hochberg	Project Lead / Systems Engineer	Point of Contact (POC) / Project Management
Elijah Don	Electrical Engineer	Quality Control Lead
Alex Roussas	Biomedical Systems Engineer	Regulatory Affairs Liaison
Ian Marcon	Mechanical Engineer	Documentation and DHF Lead
Ethan Vanderpool	Materials & Test Engineer	Risk Management Lead

Mentor Signature

Team Members Signatures

Faculty Mentor – Capstone Team Agreement

Team Name: Mayo Synapse, Empathy LLM Team #: 19
Project Name: Mayo Synapse, Empathy LLM

BME Capstone is a yearlong sequence of two courses (BME 417 & BME 490). During the fall semester (BME 417) teams will be doing needs assessment, concept brainstorming, concept evaluation, engineering analysis, and technical and mathematical modeling. During the spring semester (BME 490) teams will be constructing physical prototypes and validating those prototypes. Each capstone team is required to work with a faculty mentor with expertise related to their capstone project. The faculty mentor's typical time commitment per semester is approximately 10 hours.

Mentor responsibilities to the capstone team are to:

- 1) Meet with the capstone team at approximately bi-weekly intervals (30-60 minutes)
- 2) Provide overall project guidance
- 3) Help with solving engineering problems (not providing the solution)
- 4) Feedback on capstone assignments
 - a. Verbal feedback during the meetings
 - b. Sign a "Faculty Mentor Project Review" form after each meeting
 - c. Provide feedback to the capstone teaching team at the end of each semester

Capstone team responsibilities to the faculty mentor are to:

- 1) Schedule and activity participate in meetings with the faculty mentor
- 2) Conduct themselves and the meetings with professionalism
- 3) Prepare all forms than require the faculty mentor's signature

Mentor Name: Asif Salekin Signature:  Date: 09/18/2025

Student Name: _____ Signature: _____

Alexander Roussas Alex R.

Tanner Hochberg Tanner H.

Ethan Vanderpool Ethan V .

Ian Marcon Ian M.

Elijah Don Elijah D.

TO: BME 417 Capstone Faculty
FROM: BME 417 Team #19
SUBJECT: DT #3 Executive Summary

Executive Summary

Our BME 417 capstone team, in collaboration with Mayo Clinic, is developing a large language model (LLM) aimed at improving empathy and communication skills in healthcare providers. This LLM will help doctors reflect on challenging patient interactions and receive feedback to enhance the overall patient experience.

During this period, we made significant progress by developing the first workflow for the actual system. Following a key meeting with our Synapse clinical mentors, we discussed and compiled our various need statements into a single, omniscient need statement that will guide the project's scope. We are pleased to report that the project is moving forward as proposed in our initial development plan.

The project has now moved into a more defined development phase. The consolidation of our need statement has clarified our direction, and the creation of a system workflow marks our first major step toward building the tool. One important insight gained is that our learning tool will not distinguish between types of clinical practitioners; it will be designed as a universal training resource for both experienced and inexperienced providers.

Our current challenges are centered on two main areas. First, we are facing struggles in accumulating the necessary data to train the model effectively. Second, we are still working to fully understand the extent of the need from the clinicians' perspective. Overcoming these hurdles is crucial for ensuring our solution is both robust and genuinely useful in a clinical setting.

Through our interactions, we've learned that clinical provider burnout is a real and growing concern, which underscores the potential impact of our project. Looking ahead, our next steps will focus on resolving our data acquisition challenges and continuing our engagement with clinical partners to gain deeper insights. This will ensure our development remains aligned with the authentic needs of healthcare professionals.

Team 19

Tanner Hochberg, Elijah Don, Alex Roussas, Ian Marcon, Ethan Vanderpool