



## Capstone Projects for the Biomedical Engineering (BME) Senior Design Course

In the BME Capstone Senior Design course, student teams of senior undergraduates develop new medical devices to solve real clinical problems. The program solicits projects identified by individual clinicians and companies in the medical device space.

The course closely follows the product development cycle as would be experienced in a commercial setting. Students will have built a working prototype by the end of the semester. This prototype serves as the showpiece at the Capstone Expo Competition, where hundreds of student teams come together from all engineering disciplines to present their projects to thousands of attendees. BME teams have won this contest 17 times based on judge's evaluations of quality of the prototype, testing accuracy, efficacy of their sales pitch, and creativity. Some students continue on to national level competitions or pursue funding. BME projects have resulted in 55 patent applications and 12 startups.

Repeat sponsors include Medtronic, Boston Scientific, Halyard Health, as well numerous startups. This is an excellent opportunity for companies. Student teams bring a completely different perspective to the design process compared to what may be achieved in-house. The course also serves as an extensive interview with 4-5 graduating seniors, where advisers see technical skills and quality of work firsthand. It is worth noting that the undergraduate team owns the IP in this case, not Georgia Tech. Assigning the IP from the students to sponsor is a simple process between student teams and their sponsor.

The course's faculty, Prof. James Rains and Dr. James Stubbs, collectively have 42 years of product development experience in the orthopedic, surgical, and radiation therapy specialties. Profs. Rains and Stubbs directly work with every team to guide the product development process.

Projects are awarded to teams that have demonstrated excellence in design, energy, and prototyping skills in previous courses or work experience. During the course of one semester (3.5 months) the students will conduct customer discovery to fully understand the clinical details and establish the user needs. These user needs are converted to design inputs (detail specifications), and the intellectual property of existing solutions is investigated to ensure freedom to operate. Multiple prototypes are iterated upon until a working version is created and subjected to engineering analysis/testing to ascertain whether the critical design inputs were in fact met. Each team has a budget to develop their prototype, and we support every team's activities via a cash donation to the BME Capstone program.

**Interested in learning more? Please join us for the final project showcase.**

### Capstone Design Expo

**Tuesday, April 24<sup>th</sup>, 4:30pm-8:00pm**

**Georgia Tech McCamish Pavilion**

*Please RSVP to Kelsey Kubelick at [kpkubelick@gatech.edu](mailto:kpkubelick@gatech.edu) by April 20*

### Contact

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