BME Student Archetype

The archetypal Biomedical Engineering undergraduate student with whom I conversed is a driven, professionally-oriented engineer with strong insight into the positive points and shortcomings of the University of Michigan BME curriculum as a result of their current senior standing.

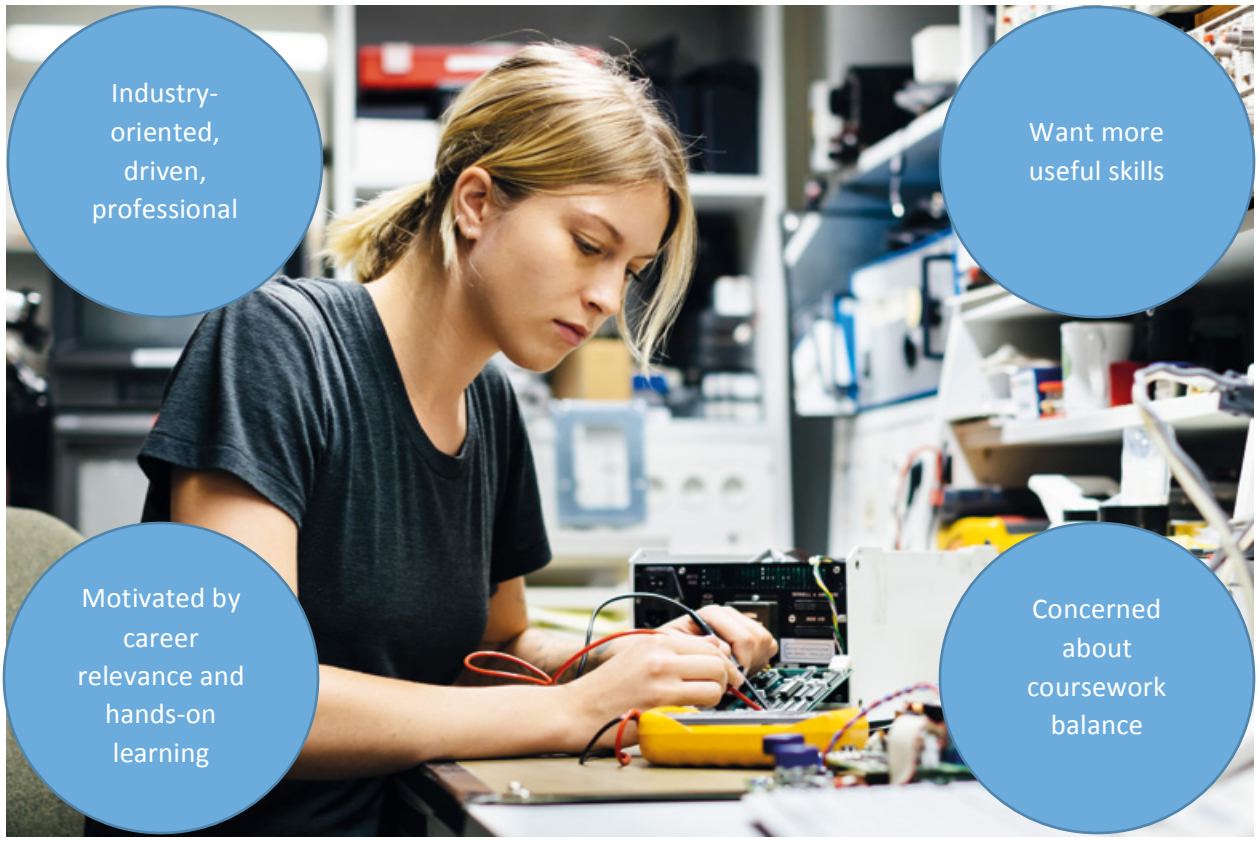
This student gravitated toward biomedical engineering as a result of some experience in which they were involved in and intrigued by the application of engineering principles and approaches to solve problems in healthcare, such as a pre-college research internship at a hospital. Entering their sophomore year, this student felt overwhelmed with pre-requisite classes that prevented them from engaging in actual biomedical engineering courses and which did not offer marketable skills, especially when compared to courses in other engineering disciplines. This lack of skill-based instruction was emphasized in conversations at the fall engineering career fair. As the student progressed through the curriculum, they became more and more concerned at how late in the curriculum skills like autoCAD and software familiarity, needs assessment and risk analysis, and other key engineering tools were introduced. Positive experiences with professors, especially Professor Joan Greve, affirmed to the student their interest in biological and medical applications of scientific precepts and engineering.

The student had at least begun to consider a career path by their sophomore year. They were confident in their desire not to pursue a medical degree, but were still weighing the amount of graduate school they expected to attend and their choice between industry and research work. Positive industry internship experiences and further study led the student to a strong desire to work in industry as they reached their senior year. Again at this point the student felt less than confident in their technical skills and readiness for an industry position, given the expectations of a design engineer.

The student is driven to learn by a variety of factors. In a general sense, they engage more with material that they feel helps them become a better engineer. The student is driven by intellectual interest as well as a recognition of practical utility in courses that effectively use a Biosystems approach to motivate the understanding of engineering material. They also feel as though they have achieved a greater understanding of a topic once they have interacted with the topic in a hands-on way, as opposed to only through a lecture course. In short, the student is motivated to learn things that are most directly applicable to the career path that has piqued their interest.

When selecting a non-required course, the student is interested in 3 things: 1) gaining relevant skills; 2) limited workload, especially outside of class; 3) effective visibility of course. The sort of non-required courses that attract the student's attention will offer them a skill or familiarity that they are already aware is useful in their chosen career path, which will offer hands-on experience primarily in class as opposed to through outside work and assignments, and which is supported by effective marketing to attract many students and to make sure that interested students are actually aware of the course and its goals.

This student has a positive view of active-engagement/hands-on learning. In their opinion, the key to not frightening off students who are less inclined towards such a learning environment is to ensure that good learning is balanced with a workload that will not complicate schedules that are already packed. Effective, structure use of time and access to relevant resources are critical.



(Brian Rubineau, Times Higher Education, “The Culture of Engineering Does Not Take Women Seriously,” October 27 2016, https://www.timeshighereducation.com/blog/culture-engineering-does-not-take-women-seriously)