If current ISE students do not believe they are adequately prepared to design controls to mitigate ergonomic risk factors, and the GOErgo group members are divided on their preparedness to incorporate ergonomics/human factors into design, how effective are industrial and systems engineers at incorporating ergonomics/human factors into the design phase of new products, work processes and everything else they are responsible for?

Preliminary results of this investigation were shared with a program director at a university ABET-accredited engineering program. This program director mentioned that his IE degree program no longer will offer stand-alone ergonomics/human factors courses, replacing them with additional courses in optimization, sustainability and continuous improvement. He mentioned a couple of reasons for this curriculum change.

First, the program wants to fulfill the requirements of ABET accreditation without adding substantial degree hours to the existing degree program. This helps the program remain competitive for top students. Second, there is a lack of qualified faculty to teach ergonomics/human factors courses. Some IE faculty lacked practical experience in ergonomics/human factors (in other words, their experience is purely academic), while others lacked any theoretical and practical experience in the field.

The same program director did mention that ergonomics/human factors will be discussed throughout the other courses when applicable, though. After discussing this finding with other engineering program directors, the aforementioned reasons were a general consensus. This is especially important considering that ABET’s “Criteria for Accrediting Engineering Program, 2016–2017” states the following for industrial engineering and related programs:

- **Curriculum:** The curriculum must prepare graduates to design, develop, implement and improve integrated systems that include people, materials, information, equipment and energy. The curriculum must include in-depth instruction to accomplish the integration of systems using appropriate analytical, computational and experimental practices.
- **Faculty:** Evidence must be provided that the program faculty understand professional practice and maintain currency in their respective professional areas. Program faculty must have responsibility and sufficient authority to define, revise, implement and achieve program objectives.

**Fix the disconnect**

There is a vast discrepancy in the number of ergonomics/human factors courses offered within the curriculum of ABET-accredited industrial and systems engineering programs (a range from zero to five required courses and zero to five elective courses). Full semester ergonomics/human factors courses are being replaced within the curriculum, with ergonomics and human factors relegated to being discussed when applicable throughout other courses.

As a side note, though, many industrial and systems engineering degree programs are allowing their students to enroll in ergonomics/human factors courses as electives outside the school of engineering; i.e., psychology, occupational health and safety and other fields. The concepts of ergonomics/human factors from elective courses outside the school of engineering may or may not help industrial and systems engineers apply these concepts in other engineering courses. And these courses may or may not prove beneficial to industrial and systems engineering students within their focus areas upon graduation.

With initiatives such as continuous improvement, optimization and sustainability, and with industrial and systems engineers taking the lead on many of these initiatives, it is important to consider ergonomics/human factors throughout each process. If not, increased work-related injuries and associated direct and indirect costs will negatively impact the efficacy of such initiatives.