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Development and modernization of a master's degree in mechanical engineering at an advanced level - evaluation of the offer from an industrial perspective

Engineering education is in transformation. Grand challenges (e.g., climate change, social problems, pandemic outbreaks), democratizing tools via digitization (e.g., 3D printing, IoT), and computational capacity mean we need to review engineering knowledge and skills for product development. Based on evaluating the present education offering in concert with the challenges and needs of companies, we have developed a new curriculum for mechanical engineering. We have surveyed companies from industry and interviewed alumni having spent time practicing and reflecting upon their education. The dialogue focused on what would make employable engineers and what would be aspects to address in education. The partners have also contributed by responding to a questionnaire to investigate the needs of prospective employees, considering their perceived changes to the product development landscape.
In the final parts of the project, the industrial partners participated in validation dialogue. They have participated in dialogue about the needs as they see them and into the foreseeable future when the first graduates will be available to them.
Basic things such as mathematics, physics, and mechanical topics are as important today. Still, we also see a shift to cross-functional issues both in entrepreneurial aspects and with more software-intensive products. Work is growing more complex, with wicked problems that require broader collaboration. Work experience in real industrial projects, acting in cross-functional collaboration, and understanding broader values beyond pure technical optimization are highly regarded.

The new program focuses on engineering product development from complementary areas, e.g., innovation engineering, modeling and simulation, machine learning, and practical application in projects. Students will be able to specialize in one of three areas (product-service systems, simulation-driven design, and data-driven design). They will take courses to develop a depth in a subdomain of engineering.
Validating the offering, the general feedback from the participants from the industry has been positive and seen as relevant from their perspective of hiring graduates.