

# Training, research and development in tune with industry

Cooperation with industry is an important pillar of BFH's teaching, research and development activities. A good example of this can be seen in the Precision Engineering and Biomedical Engineering master's degree programmes.  Mike Sommer

The modification of a surface by applying a coating in the nanometre range can have a purely decorative purpose. But it can also give a surface a specific function. Examples include optical lenses with an anti-reflective coating, or coatings that protect the carrier material from corrosion. Swiss Cluster, a company based in Thun, manufactures reactors for the application of such coatings. To develop its products, the start-up relies on the expertise of the BFH Thin Films and Surfaces research group. "The thin film community in Switzerland is rather small, people get to know one another and stay in touch," says Sylvain Le Coultre, head of the research group and lecturer at BFH. His team is currently developing a rotating and heatable substrate holder for coating reactors for Swiss Cluster. It is based on a different concept to currently available products. Moreover, it is cheaper. A student from the Precision Engineering master's degree programme is also involved. He will probably also write his master's thesis in collaboration with the Thun-based company. For Sylvain Le Coultre, this is a win-win situation: "The project partner benefits from our expertise and our technical infrastructure. Thanks to this type of commissioned project, BFH can carry out practice-oriented research and development work."

## Bernese hub for medical technology

In addition to teaching and training, cooperation with industry is one of BFH's core missions. This ensures that BFH's knowledge flows into society, and that teaching activities keep pace with the times and are geared to the needs of the industry. Embedding BFH in research and business networks is important for the effective transfer of knowledge and technology. The canton of Bern is an excellent place for this. "There is a concentration of renowned players in medical technology here," says Volker Koch, professor of Biomedical Engineering and head of the Master's Programmes division at BFH-TI. In

addition to medical technology companies and hospitals, such players include BFH's Institute for Human Centered Engineering (HuCE), the ARTORG Center for Biomedical Engineering Research at the University of Bern, and the Swiss Institute for Translational and Entrepreneurial Medicine (Sitem Insel Ltd.).

The master's degree programme in Biomedical Engineering is affiliated to the Faculty of Medicine of the University of Bern, which has run the programme jointly with BFH since 2006. It offers students with a bachelor's degree in engineering or science access to a university studies in engineering. The master's degree programme includes optional specialisations in the fields of Biomechanics, Electronic Implants and Image-Guided Therapy. In the course of their master's thesis, students are often involved in larger projects that

## The canton of Bern, an innovation hub

"With the new School of Precision and Medical Engineering, the University of Bern, in close cooperation with Bern University of Applied Sciences, is entering the field of higher education in engineering, which will be complementary and equivalent to the ETHs. The initial stage was the launch of the master's degree programme, in 2022. Building on this, a doctoral programme will be created and a new research centre for precision and medical engineering will gradually be developed, which will work closely with industry."

Excerpt from the 2023–2026 government guidelines of the Bernese Government Council



Students who started the Biomedical Engineering master's degree programme in autumn 2023 will put their knowledge to good use for the benefit of hospitals and companies. (Photo: BFH)

offer technical innovations for medical practice. These projects are financed with the support of the public sector, in particular from Innosuisse, but also of the Swiss National Foundation or the EU. "BFH projects usually involve a business partner. As a result, our students are already in contact with companies during their studies. "This often serves as a springboard for their career," stresses Volker Koch.

#### **A laboratory for creative development activities**

"The cooperation between BFH and the university also makes the Precision Engineering master's degree programme unique," says the head of the Optical Engineering specialisation, BFH lecturer Beat Neuenschwander, who also heads the BFH Institute Applied Laser, Photonics and Surface Technologies (ALPS). The joint master's degree programme has been run by the University of Bern and BFH since 2022. It deals with future-oriented themes such as additive and subtractive manufacturing or microfabrication and nanofabrication. Its 'centre-piece' is the Creative Engineering Lab in Bern. "This is where students learn the creative process and the basics which allows them to develop marketable applications," explains Beat Neuenschwander. "Their work in interdisciplinary teams is supervised by research associates and lecturers who have a lot of experience in working with industry."

Volker Koch and Beat Neuenschwander are convinced that the two master's degree programmes will make a valuable contribution to overcoming the shortage of skilled workers in industry. Engineers who have proven expertise and a creative, entrepreneurial spirit are in high demand. Students acquire the relevant skills in their project work or master's thesis, in which they often deal with specific issues brought forward by hospitals or companies. This initial practical experience makes them sought-after specialists in industry and also enables them to develop an innovative idea into a successful product or service with their own company.



Further information

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