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LIVING UP TO THE APPLIED IN UNIVERSITY OF APPLIED SCIENCES: HOW THE VIBES PIONEER MISSION REVOLUTIONIZES THE TRAINING OF ASPIRING ENGINEERS AND SCIENTISTS IN BREMEN.

Abstract

At the Institute of Aerospace Technology (IAT) of the City University of Applied Sciences Bremen (HSB), the Visionary Ingenuity Boosting European Spacecraft (VIBES) satellite research program is pioneering a transformative approach to space education and research. The goal is to closely link the curriculum of the students with the research conducted at IAT. This shall provide students with the opportunity to learn hands-on by contributing to the real space missions of the IAT. Leveraging the small class sizes at HSB, students receive direct mentorship from professors and researchers, facilitating a seamless exchange of knowledge.

The paper outlines how this approach is being applied for the first time in a class on Satellite Systems/Orbital Systems in the summer term 2024. The class is part of the Bachelor of Aerospace Engineering program of the HSB and focuses on systems engineering for spacecraft, including mission design, requirements definition and spacecraft development. Usually, students are tasked to provide a top-level proposal for a space mission already under development or one that has been flown. While this approach offers the students with a general understanding of how a spacecraft functions, it lacks true hands-on learning opportunities. Therefore, the students of this summer term are divided into groups to contribute to the different architectures of the VIBES Pioneer spacecraft, a 3U CubeSat that is currently under development at the IAT and that will be launched on the second flight of RFA ONE at the end of 2024. The students will be guided by experienced members of the VIBES team who will act as mentors to the team. Beyond working with the VIBES team and their group members, the students will also have to collaborate with industrial and institutional partners such as OHB System AG, ZARM and DLR. This will put the students in the same situations as they will later find in their professional careers.

The summer term concludes in July of 2024. The outcomes of this first pilot run will be analysed and discussed in this paper as well as its potential for expansion to other classes, aiming to inspire and equip the next generation of space explorers and to motivate other universities to explore similar hands-on teaching concepts.