

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
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## PROJECT BASED UNDERGRADUATE SPACE ENGINEERING EDUCATION

**Abstract**

Space projects involve many novel missions which will be of great help in developing new technology for lighter, stronger and capable spacecraft and reusable launch systems, for creating a living civilization in earth orbits and then in the solar system. Space project work is inherently interdisciplinary and in most cases, multinational. Space engineering education prepares students for the design, control, analysis, testing and operation of aerospace vehicles. The space engineering (SE) education is usually taken at graduate level rather than undergraduate one. There are only very few undergraduate SE programs all over the world. Most programs offer aerospace degree, in which majority of study is related to air vehicles rather than space ones. However, increasing space work force may need further SE programs to be opened, worldwide. The Astronautical Engineering Department of Istanbul Technical University (ITU-SE) was established in 1983 as one of the three departments of newly opened Faculty of Aeronautics and Astronautics. The program started for graduate studies only and did not accept undergraduate students until 1986. Since then more than 500 Astronautical engineers have taken Bachelor degree from the department. Over the years, the program has been subject to a continuous improvement process, and currently is fully accredited by ABET of USA, till 2017. The department has built 2 CubeSats that were launched in to LEO and currently involved with a number of other CubeSats developments including international cooperation. Owing to the national developments in the space fields, new undergraduate programs have been opened in various locations in Turkey, with an effort to follow ITU SE department. However, those new programs lack experienced instructors and facilities. An important element of space engineering is project based courses. A space science and technology education consortium composed of space related academic institutions with participation of related government bodies and industry is being established to aid the undergraduate space engineering education, throughout the country, along with international collaborations. A good example is UNISEC of Japan. UN is also running programs particularly to support space programs in developing countries. The full paper will discuss various aspects of project based undergraduate space engineering education to increase the qualified space sector work force.