

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Interactive Presentations - IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (IP)

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A HAND-ON COURSE BASED ON MODEL ROCKET TO DEVELOP THE COMPREHENSIVE  
ABILITIES OF UNDERGRADUATES

**Abstract**

The space system, including launch vehicle, spacecraft, satellite, etc., is becoming more and more complicated. The space industry requires engineers with wide knowledges. For example, the aerodynamic engineers should also have profound knowledges about trajectories, propulsion, control, etc. The engineers should have enough social skills to lead a group with engineers from different departments in a company. They should speak more than two languages to work in an international group. It is a challenge to develop all the above abilities for student in the university. The author designed a course that can promote the students to develop the comprehensive abilities. This course is with 120 credit hours. The students spend one semester to learn the knowledges of Flight Mechanics, Flight Control and Design Methodology. In the second semester, the students are divided into several groups to design, make and test their own model rocket with team work. The management methods, which is for developing the large space vehicle in the industry, are applied in the students' work.

In this paper, the teaching contents, including fundamental knowledges, technical training and soft skills, are introduced. The specially designed homework for students is discussed. The launched model rockets are shown as well.