

## SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)

Enabling The Future – Developing the Project Management and the Technical Space Workforce (3)

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SEEDS – THE INTERNATIONAL MASTER PROGRAMME FOR PREPARING THE YOUNG  
SYSTEM ENGINEERS FOR EXPLORATION**Abstract**

The SEEDS initiative originated by Politecnico di Torino and Thales Alenia Space Italy in 2005. It aimed at establishing a Post Graduate International Master Course in Space Exploration and Development Systems “SEEDS”, to offer an opportunity to young engineers to get prepared for the future of Europe in space. The SEEDS project has been shared with Supaero Toulouse in France and with Universität Bremen (together with ZARM) in Germany, as the three European towns (Torino, Toulouse and Bremen) have a long common tradition of space activities at both the industrial and academic level and represent three poles of the European cooperation in space programmes. The Master course comprises two different steps in sequence: an initial Learning Phase and a Project Work Phase. Both the Learning and the Project Work Phase pursue a multidisciplinary approach, where all specialized disciplines are blended together and integrated to make the Students able to acquire the system view and then to accomplish the conceptual design, through the Systems Engineering approach, of a selected case-study. The distinguishing feature of the SEEDS Master is without any doubt the Project Work activity, performed by all students together under the supervision of academic and industrial Tutors, coordinated by the Education Project Manager. Main objective of the Project Work is to train the Students on the basic principles of the System Engineering Design, through their application on a well defined project related to a specific space exploration mission. The Project Work includes the Preparatory Work, during which the Students, starting from the definition of the mission statement, focus on the identification of the complete architecture of the space exploration mission, and the Conceptual Design activities, performed in the three European sites to develop a limited number of building blocks identified during the Preparatory Work. The first year of activity started in November 2005, with a Plenary Opening which took place at the ESA-ERASMUS Centre, Noordwijk, with the full support of the Human Space-Flight Microgravity and Exploration Directorate of ESA. Five years of activities have passed since then and five project works have been successfully completed, dealing with various space exploration themes. The paper focuses on the description of the Master course and on the main results achieved in terms of project work activities and development of the future space workforce. The positive experience of five years of SEEDS is brought to evidence and the lessons learned are discussed.