

SPACE SYSTEMS SYMPOSIUM (D1)  
System Engineering Tools, Processes & Training (3)

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SPACE SYSTEMS ENGINEERING: AN ACADEMIC PROGRAM REFLECTING COLLABORATION  
BETWEEN GOVERNMENT, INDUSTRY AND ACADEMIA (OPEN ACADEMIC MODEL)

**Abstract**

There is an increasing recognition within the space and defense sectors of the increasing importance of systems engineering for the successful completion of complex development and integration projects. A domain-independent systems engineering program was launched at Stevens Institute of Technology in 2000 in the form of the System Design and Operational Effectiveness (SDOE) Program within the Department of Systems Engineering and Engineering Management [ICED, 2003; ICED, 2001]. This program has since grown to be the largest systems engineering program in the United States, and has become part of the new School of Systems and Enterprises at Stevens Institute of Technology. An over-arching collaborative principle of this school is the Open Academic Model (OAM), where the intent is to enhance the learning experience of the students by blurring the boundary between academia, industry, and government by blending academic rigor with industrial relevance. As a specific manifestation of this principle, the faculty of the school has recently developed the first domain-oriented program – Space Systems Engineering.

The objective of this paper is to present the formulation of a Space Systems Engineering graduate program, and the methodology used to develop this program (in collaboration with NASA's Johnson Space Center). Ongoing research with regard to reference curricula in systems engineering and space systems engineering was leveraged in this regard, and is summarized in this paper. Furthermore, this program has been piloted at Johnson Space Center to a diverse student body, representing both contractors and customers, and a variety of experience levels. This paper will summarize the results from this pilot program and synthesize specific lessons learned. The paper will also conclude with specific recommendations for developing domain-oriented systems engineering programs.

The authors certify that this paper has not been presented or published at any other forum. The paper will include substantive research on reference curricula for systems engineering in general, and space systems engineering in particular.

The authors also certify that two of the three co-authors will attend the conference.

References:

[ICED, 2001] Verma, D. and B. Gallois, "System Design and Operational Effectiveness (SDOE): Interface between System Developers and Users", Proceedings, International Conference on Engineering Design, ICED 2001, Glasgow, August 2001.

[ICED, 2003] Verma, D., M. Pennotti, D. Buede, and J. Farr, "Modular System Design and Operational Effectiveness Program: Experiences and Lessons Learned", Proceedings, International Conference on Engineering Design, ICED 2003, Stockholm, August 2003.