

Air Force Academy Launches New Majors

Systems Engineering and Systems Engineering Management

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The U.S. Air Force desperately needs “airmen and a vibrant civilian workforce with science, technology, and systems-engineering skills.”

—Dr. James Roche, Secretary of the Air Force

With these words from the Secretary of the Air Force in the summer of 2002, the Air Force Academy took up the challenge. In true systems engineering fashion, Academy professors formed an interdisciplinary tiger team to determine customer requirements and constraints, evaluate curriculum alternatives, and develop a forward-looking concept of operations. The team surveyed the finest system engineering programs in the nation, including the majors currently in place at West Point and the Naval Academy. Under the close mentorship of Air Force Chief Scientist Dr. Alex Levis, together with a lineup of world renowned systems engineering educators and leaders, the team crafted two new majors: *Systems Engineering* and *Systems Engineering Management*.



Cadets in Engineering 100 prepare to test one of their first systems, a boost-glide concept demonstrator.

Both programs will emphasize a system-of-systems approach consisting of a rigorous systems engineering program augmented with studies in human systems, operations research, and program management. Both programs will also leverage the Air Force Academy's robust and

broad-based 85-semester hour core program consisting of required courses in humanities, social sciences, basic sciences, and engineering. All freshman cadets now take Engineering 100—a brand new engineering core course entitled Introduction to Engineering Sys-

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Cadet-built FALCONSAT 2 satellite being hoisted onto a test bed at Kirtland Air Force Base, N.M. The U.S. Air Force Academy small satellite program was featured in the article "Learning Space by Doing Space" in the 2002 July-August issue of *Program Manager*.



tems. Cadet teams learn systems engineering processes and tools while designing, building, and flying a boost-glide concept demonstrator system.

Cadets who choose to major in systems engineering will expand their technical knowledge in one of several engineering options to include aeronautical systems, communication systems, computer systems, control systems, human systems, information systems, mechanical systems, or space systems. Systems engineering management majors will hone their program management skills through courses in project management, managerial accounting, finance, organizational behavior, information systems, and operations research.

Both programs also include a four-course sequence covering systems engineering theory and application that culminates in a year-long capstone engineering design experience. Cadets majoring in Systems engineering or systems engineering management will work alongside other engineering majors to form true interdisciplinary teams. Commenting on the program, Col. Cary Fisher, engineering division chair and chair of the Systems Engineering Steering Group, says, "To me, the heart of this program

will be the cadet's capstone design experience. We plan to leverage our existing engineering capstone projects such as our unmanned aerial vehicle work for the Air Force, our SAE [Society of Automotive Engineers] Formula race car, and ASME [American Society of Mechanical Engineers] Human Powered Vehicle student competitions as well as our unique small satellite program, to name just a few. All cadets participating in

Steering Group, says, "Our Air Force leadership is committed to the development of officers who are capable of taking a systems view—officers who will be able to address cost, schedule, performance, and risk simultaneously."

The Air Force Academy is looking for officers to help teach and further develop the systems engineering curricula. Those with both a technical and a management education, with at least a master's degree and several years of systems engineering/program management experience, contact Maj. Brett Scott at brett.scott@usafa.af.mil; those with a master's degree or higher in systems engineering or engineering, and systems engineering experience, contact Capt. Jason Bartolomei at jake.bartolomei@usafa.af.mil; those with a master's

Cadet competing in SAE Formula Race Car competition.



these programs will directly benefit from the addition of systems engineering and systems engineering management majors to these design teams."

Emphasizing the importance of the two new programs, Col. Kevin Davis, head of the department of management and a member of the Systems Engineering

degree or higher specializing in human systems or human factors engineering, contact Lt. Col. Stu Turner at stu.turner@usafa.af.mil.

Editor's Note: More information on programs offered by the Air Force Academy is available at < <http://www.usafa.af.mil> >.