



Program: FY21 SURP Strategic Focus Area: Systems architecture

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Objectives

The objective of the ASU Space Works Program is to provide relevancy and realism of exploration design process to students in a rigorous, applied way utilizing the ASU Space Works Instrument Incubator 3,000 sq. ft. of engineering maker space. This program brings together the best of university education and industry practices into a single project-based program. It takes full advantage of the coursework and experience that students receive from the ASU's Fulton Engineering College and School of Earth and Space Exploration and combine this education with the opportunity for student teams to work through the mission design, fabrication, and testing of their mission concepts.

Background

The ASU Space Works Program is actively participating in the development of the workforce of the space industry. This program brings together educators and industry partners to ensure that the content of the program is focusing on key areas that will prepare the student for the jobs in the future. As complexity increases across the industry, it is essential that students understand how to design, build, test, and qualify designs from subsystems to higher level systems and operational projects. This level of development requires the ability to understand multiple engineering disciplines and effectively manage interfaces and requirements. The ASU Space Works Program provides the opportunity for students to apply their discipline coursework in a relevant, hands-on way to JPL-based projects while following the rigorous procedures, practices, and protocols that are in alignment to JPL's mission methodologies and exploration mindset. As the students progress through the program, JPL's Series of Special Topic Lectures will enhance the students' capabilities and provide additional engineering tools to apply to their specific course work.

Approach and Results

The approach will be to provide a series of special topic lectures given by JPL SMEs covering a range of topics from Systems Engineering, V&V and Integration and test. These topics will supplement the Space Works 2 semester. Space Works 2 focuses on Model validation, Fabrication, Test, Iterate and Re-test. All culminating with a deep dive design at the end of the Semester, where JPL will provide a Team X like design for the students to work over the course of 2 weeks. Ideally this was supposed to be hosted at JPL but due to Covid-19 restrictions the "Team X" session was held virtually with students from ASUs Space Works 2 Class. Additionally since this was a virtual event, students participated from across the country spanning Hawaii to the East Coast. The deliverables the students generated from the Team X session are listed below:

Significance/Benefits to JPL and NASA

By providing deep dives into Systems Engineering, V&V and Integration and Test as a lecture series in the ASU Space Works program, this helps aligning JPL and ASU principles and practices for building future payloads for JPL led missions. This seed effort will keep ASU and JPL in lock step on how JPL led missions are developed, built and validated. The proposed effort may lead to more ASU mission or payload proposals having more PI's come from ASU. Additionally, students who support ASU in the design and development of payloads will also be developing valuable engineering skills that can translate to JPL needed workforce. As students work projects in the Space Works program with the JPL approaches, JPL will have a large set of students to select from that can more readily become high contributors to JPL projects as students or early career hires, thus strengthening JPL workforce.



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