AggieSat Lab

Sponsors:
AggieSat2 (launch July 2009, operated on orbit for 230 days):

AggieSat4 (planned for launch in 2012):

Depending entirely on external funding, the Lab is currently seeking donors, sponsors, partners, friends to help make this mission possible.

Student Involvement
I. Integrated Approach to Small Spacecraft Research, Design-Build-Fly Education.
II. Students responsible for whole design process: concept to end-of-mission.
III. Business environment with real-world deliverables, quality assurance checks, documentation, organization.
IV. Integrated Concurrent Engineering Lab: rapid trade studies, capturing corporate knowledge.
V. Students gain hands-on mastery in current tools, systems engineering, and industry practices related to specification, design, analysis, fabrication, testing of space vehicle systems.
VI. Context for this program is in advancing small real satellites, yet skill set learned is applicable to wide variety of disciplines and industries.

Examples of Recent Student Activities:
I. Software Development
   A. Flight Software
   B. Ground Software

II. AggieSat2 Operations
   A. Program Manager, Subsystem Leads
   B. Tracking Operations
      i. Flight Director
      ii. Spacecraft Operator
      iii. Tracking Operator
   C. Fault Tree Analysis
III. AggieSat4 Preliminary Design
   A. Program Manager, Subsystem Leads
   B. Establishing and Flowing Down Mission Requirements
   C. Trade Studies
   D. New Documentation Procedures

Multidisciplinary Teamwork
AggieSat Lab integrates graduate and undergraduate students, with ~80% freshmen through seniors. Students of any discipline are welcome to join, and since start of program in 2005, following majors have participated:

Engineering:
- Aerospace
- Computer Science
- Computer Engineering
- Electrical
- Industrial
- Mechanical
- Technology

Business:
- Accounting
- Marketing
- Education
- Finance
- Management
- Info Systems

Sciences:
- Mathematics
- Physics
- Biology

Our only requirement is that students be US citizens, per Federal law.

Main Technical Objectives
I. Through NASA-JSC, complete 4 missions of increasing complexity with last demonstrating ARD (Autonomous Rendezvous & Docking).

A. DRAGONSAT/AggieSat2 –
   Operated on orbit for 230 days collecting DRAGON GPS data for mission success
   - 1st of 4 test missions
   - Released from STS-127 30 July 2009
   - De-orbit 17 March 2010

B. AggieSat4 - Launch 2012
   - 2nd of 4 test missions
   - In Preliminary Design phase
   - Spacecraft separation, stabilization, inter-satellite communications, and navigation solutions using DRAGON

II. Modular software, hardware configurability
A. Develop architecture and standard interfaces emulating PC industry
B. Develop plug-and-play hardware
C. Reuse software: multiple missions

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