• Strong number of students – 683 total
• Ranked by USN&WR – 10th overall, 7th public
• Approximately 115 students graduating this year
• Growing enrichment / retention / outreach programs
• New resources for enhancing undergraduate program
Undergraduate Enrollment Overview

<table>
<thead>
<tr>
<th>Year</th>
<th>AERO</th>
<th>AERL</th>
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<tr>
<td>2011</td>
<td>353</td>
<td>330</td>
</tr>
</tbody>
</table>
Breakdown of Undergraduate Population – Fall 2011

• Females: 14.5%
• Minorities: 22.4%
  – Hispanics: 17%
• Average SAT score of incoming freshmen: 1284
• Incoming National Merits: 6
• Incoming National Hispanic Scholars: 5
Historical Data and Projections* – BS Graduates
Plan for progression of incoming freshmen to graduates

- Admitted Students for Fall 2011: 335
- Enrolled Students (yield ~60%): 200
- AERO Upper-level Students (retention ~60%): 120
- AERO Graduating Students (retention ~83%): 100
Undergraduate Curriculum

• **Common freshman year** – AERO 101.

• **Sophomore year** – Aerospace-specific courses.
  – Introduction to AERO, Statics, Materials, Computation
  – Dynamics, Thermodynamics, Continuum Mechanics, Numerical Methods

• **Junior year** – Cover three discipline areas of program.

• **Senior year** – Two-semester capstone design (4 options), design electives (6 options), and technical electives (20 options).
Two semester Capstone Design Sequence
Multiple Disciplines – Aircraft, Rockets, Satellites, Rotorcraft
Fly!
Vertical and Horizontal Integration of Curriculum with Focus on Experiential Learning
Enrichment: Active Student Organizations

- American Institute of Aeronautics and Astronautics (AIAA)
- Sigma Gamma Tau (SGT)
- AggieSat
- Society of Flight Test Engineers (SFTE)
- Students for Exploration and Development of Space (SEDS)
Enrichment: Hands-on Student Design
Engineering Experiential Learning + Leadership

AggieSat Lab, Solar Plane, SAE AeroDesign, Aggie AERO Balloon Team
Enrichment: AggieSat Lab

- Develop and demonstrate technologies by using small-satellites, while educating students and enriching undergraduate experience.

- Integrated approach to small-spacecraft research, design-build-fly, education for multidisciplinary teams of freshmen through graduate students, along with industry and government affiliates.

- Currently engaged in 4-mission campaign with NASA JSC and Texas for autonomous rendezvous and docking.
Enrichment: Society of Flight Test Engineers Solar Plane Project

- Design long-range solar powered aircraft.
- Utilize green energy methods.
- Developed high school competition project with pilot program to be held Summer 2012.
Enrichment: SAE AeroDesign

- Fourth-year of the program.
- Program provides exposure to the real engineering situations.
- Students perform trade-off studies and making compromises to optimally meet mission requirements.
Enrichment: Aggie AERO Balloon Team

- Lighter-Than-Air Balloon project.
- Pilot program in Summer 2011 and featured on main TAMU site.
- Two flights in Texas thus far.
- Research trips planned across USA (including Alaska) and Europe.
- Received reallocation funding from University.
Enrichment: Undergraduate Research

Cutting-edge Research Opportunities
Pipeline for graduate school

Programs
USRG
REU
491 Research
ESP
AERO Honors
Enrichment: Globalization Opportunities

- Current study abroad in Brazil and India.
- Future expansion planned in Europe.
Retention: Active Undergraduate Mentoring Program

Freshmen: Have Upper-level AERO mentors.
Sophomores: Have Upper-level Peer Teachers.
Juniors and Seniors: Serve as Mentors and Peer Teachers.
Retention: Industry Interactions

- Visits on-site and classroom experiences.
- Mentoring program.
Outreach: K-12

Camp SOAR (Summer Opportunities in Aerospace Research)
- Working in conjunction with ECEN on camp and project
  Physics & Engineering Festival
  COE Summer Camps
  Youth Adventure Program Engineering Camp
  Targeting high school efforts
  Working with student organizations
Outreach: Space Shuttle Mission Simulator (SMS)
Go beyond.
Resources for Enhancement

• Differential Tuition

• University-level Reallocation Funds
  – High-impact learning
  – Multi-disciplinary design
  – Advising
  – Diversity
Resources for Enhancement

• Differential Tuition

*People* – Lecturers, lab instructor lecturer

*Labs / Facilities* – Design studio, capstone design group area, computers for seminar/work area, help desk in computer lab, hands-on learning tools
Hands-on Learning Tools

Jet Engine System
Hands-on experiential learning type of approach to learning the operation of a jet engine.

*Courses enhanced:* AERO 212, 351, 417

Unmanned Air System Flight Experience
Permit students to collect and analyze real stability and control data obtained from flight testing of UAS vehicles.

*Courses enhanced:* AERO 421, 422, 445

Structures Learning
Demonstrate bending/torsion of wings, bend/twist coupling of composite laminates, buckling, and thermal stresses.

*Courses enhanced:* AERO 214, 304, 306, 405
Additional Resources for Enhancement

- University-level Reallocation Funds

  *High-impact learning* - Scholarships for study abroad, enhance peer mentoring, develop peer teachers.

  *Multi-disciplinary design* - Lighter Than Air balloon design project, Physics & Engineering Festival hands-on demonstrations.

  *Advising/Outreach* – Student-led workshops, Camp SOAR (Summer Opportunities in Aerospace Research), K-12 outreach.

  *Diversity* - Women in Aerospace Engineering, targeted mentoring.
Needs

1) Infrastructure – Larger teaching classroom.
2) Resources to expand student design / multi-disciplinary design projects.
3) Increased number of scholarships.