Learning Objectives

What are the learning objectives (expressed as measurable outcomes) for this subject?

Students will be able to:
1) Actively participate in discussing aeronautics and astronautics lecture material at the time of the class lecture (from reading the assigned book chapters beforehand).
2) Introduce a wide range of disciplines and challenges of aerospace engineering.
3) Calculate lift and drag for blimps and airfoils to evaluate aerodynamic designs.
4) Communicate and document engineering analysis and the design process for an aerospace system.
5) Design and operate a lighter-than-air vehicle.
6) Participate as a contributing member of an engineering team comprised of 3-6 students (i.e., delta design game, model rocket design, LTA vehicle design).

Measurable Outcomes (assessment method):

Students will be able to:
1) Discuss aeronautics, astronautics, and design lecture material and knowledge gained before and after lectures have occurred. Students accept responsibility for their own learning.
2) Use lift and drag calculations to evaluate aerodynamic vehicle performance (homework, reading assessments, design reviews (PDR and CDR)).
3) Approximate/estimate aerodynamic performance of LTA vehicle (problem sets, concept quiz, peer instruction).
4) Present preliminary and completed lighter-than-air vehicle team concepts and designs (electronic PDR and CDR presentations to a faculty jury and peers, student individual portfolios presented either electronically or in hard copy, all students must present orally at either the PDR or CDR).
   4.1 Oral presentation, format, and content
   4.2 Multiple design concepts (PDR)
   4.3 Final design concept (CDR)
   4.4 Drawings (PDR-schematics and multiview, CDR-scale drawings)
   4.5 Calculate flight parameters (lift, drag, mass, duration, propulsion, electronics)
   4.6 Prepare a term-long schedule and management plan
   4.7 Specify any other additional needs
5) Team design of LTA vehicle (notebooks, prototypes, drawings (hard copy and electronic), computer models, operational subsystems, flying LTA vehicle, peer instruction).
6) Contribute to team design (peer evaluations, self evaluations, instructor grade).