use. Similarly, a representative set of development milestones and design products should be utilized to break the process down into manageable steps, and to develop experience in documenting and communicating the design progress according to professional engineering standards.

5) Projects should be complex enough that the nature of modern engineering endeavors can be experienced, where cooperation within large teams is needed, and a wide range of skills must be brought to bear to produce a viable solution. Accordingly, projects should be multidisciplinary, requiring a breadth of expertise covering mechanical, electrical, and software engineering aspects, distinct roles to be identified on the team, and significant organization and cooperation within the team.
6) Provide a significant opportunity for all students to develop leadership and technical communication skills.

Clearly, this set of learning goals touches on the ABET knowledge categories K1-K3, and all eight of the ABET Abilities (Section 2.2). Specific knowledge sub-categories under K4 that Senior Projects fulfills have been defined based on input from industry leaders as follows:

- Development of engineering specifications from system level requirements.
  - The design process, phases and approach
  - Setting system goals and requirements
  - Defining function, concept and architecture
- Engineering design trades and system compromises
  - Tradeoffs, judgment, risk and balance in resolution
  - Disciplinary, multidisciplinary and multi-objective design
  - Prioritization and focus
  - System modeling to ensure goals can be met
- Design and development of mechanical drawings and specifications
- Design and development of software diagrams and specifications
- Design and development of electrical schematics and specifications
- Fabrication techniques and manufacturing processes
- Development of fabrication and integration plans
- Experimental measurement techniques & instrumentation
- Development of experimental test and verification plans
- Development of project management plans
- Project management techniques and practices
- Technical presentations and documentation

All students are expected to have a basic level of proficiency, defined as “
”, all of the topics listed above at ( ) -10 (a) 4 (l) -2 (l) 18 ( ) -10 (of) 13 ( )-10 6 l(i) -2 20(w) 20

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By the completion of senior projects, students are expected to be able to participate in and contribute to the core knowledge area (K4) in addition to K1-K3 and A1-A8 that constitute the learning goals for the ite

The graded deliverables in the course are as follows.

Fall

Written document
Define specific project objectives and scope

Oral team presentation based on a PowerPoint document
Show functional requirements, system interdependencies, and identify risks
Present trade studies with analyses completed to select a baseline approach
Propose initial baseline design
Present plan for prototyping and modeling

Oral team presentation based on a PowerPoint document
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Lectures and Workshops

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A course calendar will be made available on the course Canvas web site. Students should utilize this resource for detailed scheduling information

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Each team will be assigned space in the senior projects labs for construction and assembly of their projects. Please respect your peers and do not disturb any items that do not belong to your team. Each team will also have a storage cabinet where they can put any supplies or sensitive equipment. Remember this is a shared space and you should return tools and clean up any messes when finished. Use of paints, thinners, epoxies or other potentially hazardous materials is not permitted in this space without prior approval of Matt Rhode, Trudy Schwartz, Robert Hodgkinson, Josh Mellin or KatieRae Williamson.

“ ,” by P.R. Scholtes, B.L. Joiner, B.J. Streibel, Oriel Inc. 2003.
“Just Enough Project Management” by Curtis R. Cook, McGraw-Hill 2005.
“Guide to the Preparation of Operational Concept Documents”, ANSI/AIAA G-043A-2012

Systems Engineers are encouraged to read
“ ,” B.S.Blanchard, and W.J.Fabrycky, Prentice Hall, 2006.
NASA Systems Engineering Website: http://spacese.spacegrant.org/

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In industry your work is often divided among several projects with separate sources of funding. Time cards are widely used to associate efforts with the proper accounts. This is not the case in senior projects, with one source of funding and no billing for personnel time. However, a variant of time cards will be used in this course to assist in managing your time wisely. The weekly time sheet (WTS) records the number of hours spent on the project, as well as a brief summary of the week’s accomplishments and your plans for the next week. This helps maintain a healthy level of effort for project success, and encourages everyone to assess and plan their own work. The WTS will be submitted to the Canvas web site, and a Teaching Fellow will collate these for distribution to the teams and advisors. A template for the WTS will be posted.

Software Office: AERO 141E Email: Joshua.Mellin@Colorado.EDU	Fabrication and PILOT Office: AERO 141E Email: KatieRae.Williamson@colorado.edu
Financial Accounting Office: AERO 224 Email: Jacquelyn.Stang@colorado.edu	Manufacturing Office: Machine Shop Email: Nathan.Coyle@Colorado.edu

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Teaching Fellow Email: Andreas.Brecl@colorado.edu	Teaching Fellow Email: Gina.Staimer@colorado.edu

Teaching Fellow

Email: Jasmin.Chadha@colorado.edu

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Product	Weight
Project Definition Document	10%
Preliminary Design Review	25%
Critical Design Review	25%
Fall Final Report	20%
Student Professionalism Review	10%
Student Performance Evaluation	10%
Total	100%

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Product	Weight
IDR Reviews (P/F) (Must pass to continue to TRR)	5%
Test Readiness Review	20%
AIAA Conference Abstract/Paper	10%
Spring Final Review	20%
Symposium (P/F)	10%
Project Final Report	20%
Student Professionalism Review	5%
Student Performance Evaluation	5%
Hardware Breakdown (P/F)	5%
Total	100%

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Students are required to act professionally towards their teammates, project sponsors, AES staff and faculty, and students. Students are also

10 Accommoda ion fo Di abili ie

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see