Systems Engineering for PSAS: Base 11 Space Challenge

Teresa Nguyen
Pronouns: they/them
PCC SE
The Setup

- Joins Portland State Aerospace Society (PSAS) in August 2018
- Opportunity to develop a science communication based project management system
- Base 11 Space Challenge
- Systems Engineering for undergrads
Why?

If PSAS is able to develop a repeatable, traceable way to create a documentation system that emphasizes science communication, then they will be able to successfully onboard new students and support retention.
So...what is Systems Engineering?

**Formal Definition**: an interdisciplinary style of engineering management that focuses on how to design and manage complex systems over their life cycles.
How does it apply?
Three Forms of Documentation

- Concept of Operations (ConOps)
- Systems Engineering Master Plan (SEMP)
- Work Breakdown Structure (WBS)
ConOps

- big picture, describes the lifecycle of the project easily to someone without a technical background
Systems Engineering Master Plan (SEMP)

- a longer document intended to guide the work of all those involved in the project. The SEMP is comprised of three main sections: technical project planning and control, systems engineering processes and engineering specialty integration.
• A deliverable-oriented breakdown of a project into smaller manageable pieces
Toolkit

- Opensource software
  - Google Drive
  - Github
  - Jupyter Notebook

- PhD student specializing in Systems Engineering

- 1 undergrad with executive functioning skills
How Data Was Collected

• Weekly mentored meetings
• Google Form surveys
• Researching different existing templates to emulate and adapt to student friendly format
What Was Discovered

• High Level Project Management in High Level Academia
• No pre-existing undergrad student models
• Team lead students were at capacity
• Data was less quantitative, more qualitative
Readjustments

Brief overview meeting
- What would you like to see?
- How can we make it better?
- How do you want to participate?

Rocket Brunch: LOX and Bagels
- SYSE overview and progress
- Team feedback
Student generated/applied flow chart
Going Forward...

Original SYSE team will continue editing documentation over the summer and onward
PSAS team gives feedback at pre-scheduled meetings

Implement SYSE development into annual project curriculum for the new year

Investigate opportunity to continue improving PSAS team structures
Acknowledgements

- Oregon Space Grant Consortium
  - Catherine Lanier
- NASA Systems Engineering Handbook
- Portland State Aerospace Society
  - Risto Rushford
  - Hakan Kutgun
  - Bert DeChant
- SCORE PCC affiliates and mentors
  - Jenna Bell
  - Julia Betts