Term Project - Cislunar Space Transport
Term Project - Top Level Requirements

- Design a system to allow the construction and support of multiple habitats in cislunar space
  - Earth-Moon L1 for deep space staging
  - Low lunar orbit for lunar surface exploration
  - Lunar distant retrograde orbit for asteroid resource recovery

- Mission models
  - Human and cargo launch and human return from cislunar space
  - Max annual cost $3B
Crew Launch and Entry Vehicle

- Top level requirements
  - Crew of four
  - Habitable volume of 14 m$^3$
  - Crew and crew systems mass 2500 kg
  - Earth entry velocity 11 km/sec (TBR)

- External mold lines (shape)
- Heat shield shape, composition, analysis
- Selection of L/D and CG location
- Nominal and contingency trajectory design
- Abort and EDL systems
Launch Vehicle

- Multipurpose launch vehicle design
  - Human lunar missions (100 MT to TLI/mission)
  - Cislunar habitat support (50 MT to TLI/year)
  - Human Mars missions (500 MT to LEO/mission)
  - Number of missions/year open-ended – maximize based on available funding

- Launch vehicle design optimization (propellants, number of stages, DV distribution, sizing, etc.)

- Trajectory analysis with abort cases

- TBD
Term Project

- Work as individuals or two-person teams (your choice)
- Design an architecture to support cislunar operations in the most cost effective manner possible
- All vehicles will be conceptually designed from scratch (no "catalog engineering"!)
- Parametric design parameters will be provided for human spacecraft systems not ENAE791-relevant
- Design process should proceed throughout the term
- Formal design presentations at end of term