**AEROSP/SPACE 583**

**Space Systems Management**

**Homework #1**

**Due: January 20 at 11:59 pm**

**Task:**

Develop an Axiomatic Design flow diagram for a Discovery Class mission.

**Notes:**

Work alone on this assignment.

Deliverables should be submitted as a PDF on Canvas.

**Deliverables:**

1. List of the stakeholders that you need to consider when writing a proposal for a Discovery Class Mars Mission in response to a NASA Announcement of Opportunity (AO). **(30 points)**

* NASA – This includes the NASA Science Mission Directorate, the Mars Exploration Program, the Mars Program Office, and JPL. These groups within NASA are ultimately responsible for choosing the mission, awarding funding, and setting the schedule.
* The Launch Provider – This is the company or companies that will launch the mission.
* Suppliers of the Instruments – for InSight, this was the suppliers for the SEIS, RISE, and internal temperature experiments.
* Testing Facilities – the facilities where the experiment will be tested, such as university research labs, private facilities, and government facilities. For InSight, this would have been IPGP in France, Institute of Planetary Research, German Aerospace Center in Germany, and JPL.
* Congress – Congress is responsible for passing NASA’s annual budget. This budget influences the money awarded to Discovery Missions.
* The Public – Ultimately, the public has the ability to influence the goals of a Discovery Mission through the taxes they pay to the government, the letters they write to Congress, and interest they show in various NASA missions. Without interest from the public NASA would fail to justify its funding to Congress.

1. Given the stakeholders from your response to question (1), and your knowledge about the constraints imposed on Discovery Class Missions, build an axiomatic flow diagram for either the InSight Mission design or a real or hypothetical mission design of your choosing. Indicate the functional requirements leading to the selection of each science instrument. Follow the Axiomatic Design process described in class. **(70 points)**

**Optional Resources:**

Canvas -> Files -> Lectures

Axiomatic Design Lectures

Canvas -> Files -> Handouts

Mars\_2020\_AO.pdf

Mars\_2020\_AO\_Questions.pdf

InSight Mission - A good place to begin your research

<https://mars.nasa.gov/insight/mission/overview/>