

WSU Aerospace Team

Rocket Information Document

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General

- Install OpenRocket – this will be for the main structure design of the rocket and some modelling aspects
- Spaceport America Cup Documents and Forms
 - <http://www.soundingrocket.org/sa-cup-documents--forms.html>
- High power certifications
 - <https://www.nar.org/high-power-rocketry-info/>
 - <http://www.tripoli.org/Certification>
- NASA Technical Reports Server – Has pretty much every NASA research article ever
 - <https://www.sti.nasa.gov/>
- NASA information on sounding rockets
 - https://www.nasa.gov/mission_pages/sounding-rockets/index.html
- NASA sounding rocket handbook
 - <https://sites.wff.nasa.gov/code810/files/SRHB.pdf>
 - This goes through all steps of building a sounding rocket in depth
- MIT version of sounding rocket handbook
 - https://snebulos.mit.edu/projects/reference/launch_vehicles/NASA/SRHB.pdf

Structure Team

- In charge of designing and build all the structures in the rocket
 - These include but are not limited to nose cone, body, and fins, avionics bay, body couplers
 - Ensure vehicle hardware can withstand all loads enacted on the rocket
- Install the latest SolidWorks 2019 version
 - <http://cougs.mme.wsu.edu/Software/index.php>
 - You must use the latest VPN the MME department is using, find it here:
 - <https://its.wsu.edu/ssl-vpn/>
 - This changed July 2019!
 - Freshman: If you have not learned CAD design in class yet, you can pick it up by watching tutorials on YouTube.
- Note if using previous SolidWorks versions, SolidWorks files are not forward-compatible so anything made in the 2019 version will NOT work with the 2018 version or earlier!
- Interesting document on increasing payload space
 - https://www.ripublication.com/aasa-spl/aasav4n1spl_16.pdf
- Nosecones
 - https://web.archive.org/web/20110411143013/http://www.if.sc.usp.br/~proj-etosulfos/artigos/NoseCone_EQN2.PDF

- <https://www.apogeerockets.com/education/downloads/Newsletter376.pdf>
- <https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20030067331.pdf>
- <https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19930091022.pdf>

Avionics Team

- This is the team that will control all the electronic systems on the vehicle
 - Deploying recovery systems, collecting data, activating payloads, telemetry
- Some resources
 - <http://www.ukrocketman.com/rocketry/avionics.shtml>
 - Harvard document on navigation and control systems: <http://adsabs.harvard.edu/full/2005ESASP.590..275L>

Payload Team

- In charge of creating the scientific payload that will be launched to conduct an experiment or complete any kind of challenge
 - Interacting with avionics/recovery for monopropeller system, 3D printing experiment, collection of upper atmospheric gases
- Look through the structures portion regarding SolidWorks – its likely much of the parts of Payload will involve CAD

Recovery Team

- In charge of anything that will ensure the safe return of the rocket and the payload after launch
 - Includes parachute deployment, descent with parachutes, and ground testing
- Ejection charge testing
 - <http://hararocketry.org/hara/resources/how-to-size-ejection-charge/>
 - <https://www.insanerocketry.com/blackpowder.html>
 - <https://wikis.mit.edu/confluence/display/RocketTeam/How+to+perform+a+ground+test>
- Parachute recovery
 - <https://arc.aiaa.org/doi/abs/10.2514/6.2018-3626>
 - <https://www.paratech-parachutes.com/ParachuteSystems/SoundingRockets.html>