

# Assignment #1: Configuration

due 9/15/2021 before midnight via Learning Suite

ME 415

50 possible points

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**Reminder:** Project homework is just like any other homework. You are welcome to work together, but each person must do their own write-up. Each person will need to know how to complete the assigned tasks. Often it is beneficial to do the problems separately, even if on the same team. This will allow you to explore more design options (you don't all have to analyze the same design), or to compare results (if evaluating the same design comparing can provide a sanity check). Your final report contains an updated version of these analyses so clear reporting will save you time later.

- 1.1 Choose your team. Report your team name, the team leader, and the names of all members of the team.
- 1.2 Choose and justify the configuration for your aircraft (you aren't locked in). In making your selection, evaluate at least three different aircraft configurations, and provide justification for your choice. You aren't expected to know all the pros and cons of the various design choices, but do some research to help you understand some of the high-level tradeoffs. Some design choices to think about include, but are not limited to: tail vs canard vs flying wing, tail type (H, V, T, etc.), pusher vs tractor, fuselage type, materials, basic wing sizing (at least the wingspan), use of winglets or not, etc. Provide a top view, or even better a 3-view, some of the primary dimensions, and justification/rationale for the design decisions.
- 1.3 Estimate the mass of your aircraft in grams. Be sure to include all electronic components. Make estimates for each aircraft subcomponent (e.g., wing, horizontal tail, motors), as opposed to the airframe all at once, or all electric components at once. Rough estimates are ok at this stage, but there needs to be a rational basis for the estimates.

Note: As the semester progresses you'll want to update your weights to allow for more accurate predictions (e.g., drag). A scale is available in the ME checkout room if needed.