Motor and propeller selection:

1. Determine governing requirements for the design:
    a. Ex. Most efficient at cruise.
    b. Ex. Has enough power required for takeoff.
2. Determine power requirements for the motor.
3. Put together a list of motors that meet requirements. Choose a variety of motors that can provide at least as much power as required from the constraint analysis
    a. Motors will state that they have a maximum power of XX watts. Make sure this is greater than the value determined in the constraint analysis.
        i. Choose a motor that is a significant margin over the minimum power required since most propeller combinations tend to lower the efficiency substantially.
    b. See recommended propellers for each motor
        i. If there are no recommendations, then choose propellers recommended for similarly sized motors.
        ii. Basics on propellers: here
    c. Recommendation: Start with known good manufacturers and see which of their motors meet the power requirements.
        i. E-flite motor lineup (partial?): https://www.horizonhobby.com/on/demandware.static/Sites-horizon-us-Site/Sites-horizon-master/default/Manuals/EFL_Brushless_Motors_Ad.pdf
4. Use eCalc to verify and iterate over propeller combinations
    a. For especially promising propellers, change the parameters a bit to see if other propellers optimize the combination even more
    b. Within eCalc, check if the propeller and motor combination still meets the maximum power requirement.
    c. e-Calce is not the end all be all and can have significant errors. So too can manufacturer specs. If possible test the motor on a thrust stand before using it.
5. With eCalc and UIUC propeller database determine the efficiency of the propeller
    a. Calculate the advance ratio using the RPM from eCalc
    b. Advance Ratio: $J = V/(nD)$
        i. V = flight velocity
        ii. N = revolutions (per second)
        iii. D = Propeller diameter
    c. If optimized for cruise, the velocity and number of revolutions should be based on cruise. So cruise velocity and the number of revolutions required to produce the required power for cruise (use the eCalc partial load calculations)
    d. Plug in the new efficiency factor for the propeller.
6. Compare motor and propeller combinations:
    a. Look for designs that meet the requirements. In particular, the most efficient configuration.

Resources from Phil Baldwin:

- https://drive.google.com/drive/folders/1xY7IlQ4HWpbVSQA_mPWPmPIpJhmns7rD?usp=drive_link
    - Motor and propeller presentations