# Modelling Detailed WBS

## Basic Offline Parameter Estimation Model

1. SimScape Model
   1. Can take an input signal
   2. ~~Outputs Linear Velocity/Displacement~~
   3. Accurately mimics system dynamics Needs Verification
   4. Alternate versions with minor differences (f.e One with Equivalent parameters and one with pulleys) Needs Verification
   5. Revise Solver settings (research configurations for improvement)
2. Live Simulink Interface
   1. ~~Connected with Arduino~~
   2. ~~Encoder Readings~~
   3. ~~Encoder Readings to Linear Displacement~~
   4. Velocity Estimation
   5. Live digital display of readings (actual numbers not scope)
   6. Ready to receive input signals
   7. Multiple Input modes
   8. Recording and saving measurements for later use
   9. Homing button to each side of the beam (OPTIONAL)
   10. Pre-prepared configurations for movements patterns (OPTIONAL)
3. Physical Model
   1. Completion of Fixations
   2. Consistent Behaviour
   3. Validation of consistency
4. Parameter Estimation
   1. Prepare Variables
   2. Look at improvements to optimization process (OPTIONAL)
   3. Initially perform P.E with MIL
   4. Perform multiple iterations of P.E with different model configurations
      1. Velocity Output
      2. Displacement Output
      3. Using basic model
      4. Using Pulleys Model
      5. Using Initial Guesses
   5. Validate results with MIL Simulation
   6. Perform P.E with Physical Model Outputs
   7. Validate P.E Results