

ME-410 Mechanical Product Design & Development

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By this week

- Slide 1: Updated motivation functionality definition with the updated state of the art (more details due to the solutions)
- Slide 2: Three solutions comparison Back hand calculation for all three solutions
- Slide 3: Final solution slide decide on the final solution direction and the motor and sensor types.

By this week

- Solutions that vary in performances not on design or motivations (e.x. as below)

Engineering specification	values	Solution A	Solution B	Solution C
Range of motion	$90 < \text{hinge range} < 300$	$90 < r < 100$	$200 < r < 300$	$40 < r < 41$
Overall payload	$10\text{N} < \text{load}$	13N	20N	50N
Bandwidth rpm	$100 < \text{rpm}$	101	200	100

By Next week

Slide 1: Final solution: concept components

- Decision reasoning on the motor and sensor
- Small sketches of other solutions of the dropped solutions
- Run a quick calculation to show the functionality with the chosen dimensions

Slide 2: Final solution: working principle

- Sketches of the product's working mechanism – schematics
- Control loop schematics

Slide 3: Final solution optimization

- identify 1 critical design dimensional parameter / sets of parameters to optimize toward improving the functionality (engineering specification) → push the dimensional limit

By this week

- Slide 3: Solutions that vary in performances not on design nor motivations

Engineering specification	values	Solution A	Solution B	Solution C	Solution B'
Range of motion	$90 < \text{hinge range} < 300$	$90 < r < 100$	$200 < r < 300$	$40 < r < 41$	$200 < r < 300$
Overall payload	$10\text{N} < \text{load}$	13N	20N	50N	30N
Bandwidth rpm	$100 < \text{rpm}$	101	200	100	200