FALL 2024  
MEC325: INTRODUCTION TO ENGINEERING DESIGN  
DESIGN PROJECT  
**PRODUCT REQUIREMENTS SPECIFICATION**



Assistive Transport of Children

when Walking

TEAM 1305

# team declaration

We, the undersigned members of Team SSNN in MEC325, agree that:

* all team members have abided by all Ryerson Policies and course rules, and
* one of our members has shared a properly completed Workload Distribution Form with our Teaching Assistant and our instructor.

We furthermore accept that any violation of Ryerson Policy or course rules will lead to a grade penalty or charges of academic misconduct.

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# Requirements

Set of requirements for each attribute

.**Functionality**

1. The product must fold to fit within an 9 cubic feet space
2. The product must hold at least 100 lbs with no more than 1 infant/ small child
   * See [SKB 3.1.1](https://docs.google.com/document/u/0/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
3. The product must have separate storage compartment
   * See [SKB 2.3](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
4. The product must have an UPF rating no less than 40
   * See [SKB 6.2](https://docs.google.com/document/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
5. The product have high maneuverability
   * See [SKB 5.4](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
6. The product must have a seat that can recline 180 degrees
   * See  [SKB 2.1](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
7. The product must have adjustable seating heights
   * See [SKB 2.1](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
8. The product must have caster angles between 2-4 degrees on the front tires
   * See [SKB 5.5](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
9. The product must have height and length adjustable handle bars
   * See [SKB 2.3](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
   * See [SKB 4.6](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
10. The product must have a suspension system
    * See [SKB 2.2](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
    * See [SKB 4.1](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
11. The product must have a braking system
12. The product must move at the speed at which the user walks with reasonable force which the user produces when walking

**Usability**

1. The product must have locking/latching system to prevent unintentional folding
2. The product must weight no more than 30lb
   * ADD research here to support this claim
   * See [SKB 2.3](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
   * See [SKB 4.2](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
   * See [SKB 4.4](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
3. The product must have a Factor of Safety (FOS) of 2
4. The product must be accessible and reliably fold
   * See [SKB 4.2](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
   * See [SKB 4.3](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
5. The product must provide shade and weather protection
   * See [SKB 2.1](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
6. The product must have an adjustable footrest
   * See [SKB 2.1](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
   * See [SKB 4.6](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
7. The product must follow ASTM International Stroller Safety Standards, ASTM F833-21, chapters 6 for performance standards
8. Standardized fasteners must be used

**Productibility**

1. The product must use off the shelf fasteners
2. Materials used must comply to ASTM International Standards for Material Safety, ASTM F1004
   * See [SKB 3.1](https://docs.google.com/document/u/0/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
3. The product must be designed for easy disassembly
4. The product must use all aluminum tubing frame
   * See [SKB 6.1](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
5. The product must use injection molding for all plastic parts

**Maintainability**

1. The product must be resistant to fluids
   * See [SKB 6.2](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
2. The product must be able to be cleaned easily
   * See [SKB 6.2](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
3. Standardized fasteners must be used
4. Fabric cover must be machine washable
   * See [SKB 6.2](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
5. The product must have easily replaceable parts
6. The product must feature non-corrosive materials
   * See [SKB 6.1](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
7. The product must allow for tool-free disassembly

**Sustainability**

1. The product must consist of minimum of 50% recycled material
2. The product must include a take-back program
3. The product must be packaged in biodegradable packaging
   * See [SKB 6.3](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
4. The product must have minimal packaging
   * See [SKB 6.3](https://docs.google.com/document/u/4/d/1YEjEXJfWXH6WhaKF20ACS39N4-rEMIp-a03EXtmuQ7s/edit)
5. The product must have a refurbish program

# images

# references

# appendix 1

1. Only the last 5 digits of the student number are required. [↑](#footnote-ref-0)