

Final Exam

University of Toronto

Faculty of Applied Science and Engineering

December 9, 2022 at 2:00PM

Authoring Instructions

1. **Place your TCard on a corner of your desk** where it is easily visible.
2. **Label your Answer Booklet** clearly, placing only one letter or number in each spot filling in your name, and student number.
3. **Label your Evidence Duo-tang** with your full name and student number in large print.
4. Write your responses in the Answer Booklet **in the space provided for that question**. Some questions have space provided across multiple pages.
5. Write in **pen**, and **do not use any corrective mechanisms that obscure content** (e.g. WhiteOut™ tape or liquid). If you want to make changes, simply cross out words.
6. **Follow any additional instructions** provided by the Proctors.

Potential Academic Offences

1. Having any aids available to you other than pens, TCard and duo-tang.
2. Conferring or collaborating with others during the midterm.
3. Having course notes or lecture slides in your Evidence Duo-tang.
4. Taking any papers out of the exam with you (from your duo-tang or otherwise)

Note that your writing must be readable by your audience (e.g. members of the Teaching Team).

Objectives

The primary objective of the final exam is to assess your understanding of the core concepts and models in Praxis I. Additionally, you are being assessed on your ability to make quality engineering arguments.

The final exam, like all written ESC101 assignments, is part of the English Proficiency Assessment mandated by the Faculty of Applied Science and Engineering. As such, one of its objectives is to assess your ability to write English coherently and clearly in a closely supervised situation.

Question 1 - Recommending a Design

(worth 40 out of 100 total marks, estimated time: 45-60 minutes)

Use the stakeholder statement on page 3, and measurements matrix on page 4 to respond to this question. All citations of the evidence should be specific (including line number for stakeholder statement).

Your stakeholder, Alix, is interested in purchasing a new pair of boots for themself (see their statement on the next page). Knowing that you have just completed a design course that discusses how to make decisions effectively, they want your recommendation for which pair of boots they should purchase.

- A) Using the stakeholder statement, generate **five (5)** complete requirements (objectives with associated metrics, constraint(s) and criteria) for Alix's boots. [10 marks, 2 marks per requirement]
- B) Justify the inclusion of **one (1)** of your five requirements discussed in Part A. [3 marks]
- C) Prioritize these requirements to identify the **three (3)** most important requirements for Alix. Using an engineering tool as evidence, explain why these three are the most important with reference to the stakeholder statement. [9 marks]
- D) Use all **five (5)** requirements to compare the different pairs of boots. Use an engineering tool as evidence to complete your comparisons. Describe what your comparisons reveal and explain how they motivate any future comparisons. [12 marks]
- E) Recommend which pair of boots to purchase. Your response to this question must be written in complete, coherent, and integrated sentences (paragraph form). [6 marks]

<p>Have you answered all of the sub-parts in the correct section of the Answer Booklet?</p>
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Stakeholder Statement from Alix

1 My doctor recently advised me to integrate more exercise into my daily
2 routine to help me build more muscle strength and endurance. She
3 recommended walking to work. I have mapped out three possible routes
4 but none of them are guaranteed to be consistently cleared of snow, slush,
5 or ice over the winter. Each of them also incorporates a gentle slope, but I
6 can imagine it being really dangerous if it gets icy. And it is really hard to
7 see ice in the dark. If I am to follow my doctor's advice, I will need a good
8 pair of boots to keep my feet warm and dry and soles that keep me from
9 slipping. But, I am also worried that these boots provide enough support
10 as my walk is a little more than 5 km each way.

11 I do not want to carry a second pair of shoes to change into once I get to
12 work, so it would be really nice if these boots had some style and didn't
13 look like heavy duty work boots. And my backpack is already heavy. I
14 also don't like clomping around in heavy shoes inside my workplace. It's
15 noisy and it hurts my back.

16 Although, I probably should take better care of my shoes. I am not always
17 diligent about cleaning and polishing. I am concerned about salt damage,
18 as I had a favourite pair of shoes ruined with salt stains a couple of years
19 ago! I always cram my foot into my boots in winter rather than deal with
20 the effort of getting them on and off correctly. Maybe I'm too lazy for nice
21 things?

Measurements Matrix for Boots

					
	Oboz Bridger Winter Boots	Eddie Bauer Storm Sneaker	Fluevog "Nerds"	Red Wing Shoes 8-Inch Classic Moc	Sorel 1964 PAC Nylon
Tread depth (mm)	4	1.5	2	1	3
Waterproofness	Waterproof nubuck	Water resistant with StormRepel® DWR finish	2.25" clearance from ground	Water-, stain-, perspiration-resistant oil-tanned leather	Seal-seamed and Waterproof
Insulation	400 g 3M™ Thinsulate insulation	N/A	N/A	N/A	Removable 9 mm washable recycled felt inner boot
Weight per boot (g)	750	454	1100	approx. 1000	885
Sole material	Rubber	Rubber	Ethylene Vinyl Acetate	Rubber	Vulcanized Rubber
Insole Type	None	Arch support	None	None	None
Exterior boot material	Water-repellent nubuck leather	Full-grain leather and fabric	Printed Leather	Full-grain oil-tanned leather	Nylon and Rubber
Lining material	Thinsulate breathable waterproof membrane	Fabric	Leather	Leather	Felt
Shaft height (in)	8	5.5	6	8	10.25
Fastening mechanism	Laces	Laces	Pull on	Laces	Laces
Heel height (in)	0.5	0	3	0.5	1.5
Price (\$ CAD)	269.99	166.00	599.00	440.00	165.00
Colour Options (count)	1	3	2	1	6

Question 2 - Converging Strand Analysis

(worth 40 out of 100 total marks, estimated time: 45-60 minutes)

This question requires you to have done two things: 1) paid attention to your (team) work and process, and 2) gathered evidence of your process to support the claims you make in your strand analysis.

First, **recall** how you worked on the Strand, and any tools, models, or concepts you used in your converging practice. Your evidence of these activities should be in your Evidence Duo-Tang. Second, **analyse** what you did specific to the focus of the Strand and how that impacted the outcomes of your (team) activity.

Write a Strand Analysis evaluating your activity during the converging strand only. **Select one (1) of the two foci below to write about, and analyse:**

- how **your** deliberate and evidence-based comparison of the candidate design concepts led to a better understanding of the concepts, or
- how a strategy **you or another team member** used helped to manage competing time demands (personal and academic) with project needs and deadlines.

Your strand analysis **should not exceed 500 words**. Refer to your evidence in your response using page and figure numbers from your Evidence Duo-Tang, e.g., (page 3, Figure 2) as appropriate. You can also circle relevant images or parts of image in your duo-tang for easy cross-referencing. An estimate to convert words to lines is provided the Answer Booklet.

Characteristics of Evaluation

Note: These characteristics may not be weighted equally.

1. Quality of introduction to frame the Strand analysis
2. Quality of analysis of the Strand focus
3. Integration of evidence of actions with analysis
4. Quality of assessment of individual actions to achieve the Strand focus
5. Clarity of written and visual expression

Have you written your strand analysis about one of the two foci, in the appropriate section of the booklet, with reference to the evidence in your duo-tang?

Question 3 Connections

(worth 20 out of 100 total marks, estimated time: 20-30 minutes)

Your response to this question must be written in complete, coherent, and integrated sentences (paragraph form).

The words listed in the table below represent a set of concepts introduced in Praxis.

- Choose exactly **four (4)** concepts from the table below.
- Connect each concept you choose to one (1) Praxis concept **not in the table below**.
 - You **must not** use any concept from Praxis more than once when answering Question 3.
 - You **must not** connect your chosen concepts to any concept that appears in the table below.
 - This will yield four (4) connected pairs comprising a total of eight (8) distinct concepts.
- For each of the four (4) connected pairs:
 - A) Define each term in the pair in the way we have used the term in Praxis [1 mark for each definition]
 - B) Explain how the two (2) concepts are related to each other [3 marks for the connection]

Table of Praxis Concepts

<input type="checkbox"/> Prototype	<input type="checkbox"/> Feedback
<input type="checkbox"/> Analysis	<input type="checkbox"/> Pairwise Comparison
<input type="checkbox"/> Reference Design	<input type="checkbox"/> Verification
<input type="checkbox"/> Recommendation	<input type="checkbox"/> Morph Chart

Have you connected four (4) concepts from the table above with four (4) other course concepts, using any concept only once? Have you explained how the concepts are related?