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2021 UofT Engineering Kompetitions

KOMPETITOR'S HANDBOOK

University of Toronto Engineering Kompetitions
January 16th, 2021 - January 17th, 2021

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We are very excited to announce that AUTODESK will be a platinum sponsor and partner for UTEK 2021. AUTODESK makes software products such as Fusion 360 for Computer Aided Design (CAD).

Gaby Waldman-Fried and Gregg Stoklosa are also judging the Senior Design kompetition.

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The Intel logo is prominently displayed in the foreground, overlaid on a photograph of two technicians in a cleanroom environment. They are wearing white protective suits, hairnets, and face masks, and are focused on working on electronic circuit boards.

Image courtesy of intel.ca

1.0 ABOUT UTEK 2021

Welcome to the 20th University of Toronto Engineering Kompetitions and thank you for choosing to participate! UTEK 2021 aims to provide students with an opportunity to apply class knowledge and acquired skills to real-world problems. It is a chance to challenge oneself, meet like-minded peers, and network with company professionals. We hope you enjoy UTEK 2021!

The purpose of this package is to provide you with an understanding of how UTEK 2021 will be running given the unique circumstances of this season! In this package, you will find the complete UTEK schedule as of December, an outline of the platforms to be used this year, as well as the outlined rules for all competitions.

For any questions, do not hesitate to reach out to the appropriate competition director, or the general UTEK email address, utek@skule.ca!

1.1 UTEK Theme

This year, the UTEK theme is making it easier to dream bigger, as we challenge competitors to think about accessibility issues in a variety of industries and how we can address them either through accessible or universal design.

Accessible design is a design process in which the needs of people with disabilities are specifically considered. Accessibility sometimes refers to the characteristic that products, services, and facilities can be independently used by people with a variety of disabilities. Universal design is a broader concept defined by The Center for Universal Design at North Carolina State University as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design." It is meant to benefit all people at little or no cost. This year, each competition will contain some component of accessibility either through the problem statement itself or the sections of the rubric. We are so excited to see how you incorporate accessibility considerations during the competition!

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2.0 SCHEDULE

Saturday January 16th, 2021

Time	Event
9:00 - 10:00	Opening Ceremonies with Keynote Speaker
10:00 - 10:45	Company Networking
10:45 - 11:00	Competition Problem Statement Briefings
11:00 - 8:00 PM	Work Time Competition Deliverables (presentations, reports, code, etc.) due based on Competition
12:00 - 1:00 PM	Autodesk Workshop *Not Confirmed*
6:00 - 7:00 PM	Live Testing (Junior/Senior design only)

DAY 1

* All competitors will know if they've made it to the second round by midnight.

Sunday January 17th, 2021

DAY 2

Time	Event
9:30 - 10:00 AM	Judge Presentation Briefing
10:00 - 12:00 PM	Live Testing (Senior design only) & Presentations
12:00 - 1:00 PM	Lunch
1:00 PM - 3:00 PM	Presentations
3:00 - 4:00 PM	Awards & Closing Ceremony 1st place: \$80/team member 2nd place: \$60/team member 3rd place: \$30/team member Prizes for every competition & prizes for Best CAD in Junior & Senior Design
4:00 - 5:00 PM	Judge Feedback & Networking OEC Information for Winning Teams

3.0 PLATFORMS

This year, UTEK will be completely conducted through our Quercus course! After purchasing your ticket through Eventbrite and registering through the google form on our website, you will be added to our course. Through the course, you will receive access to your problem statements, submit your solutions, ask questions and present!

Ensure that you are added to the course before the competition weekend begins Saturday at 9am. The opening ceremony and award ceremony will also be taking place through Quercus so ensure that you keep your notifications on to catch updates and announcements.

Once you've been added to the Quercus page, check the "People" page and check that you've been added to a group. If you are not part of a group, make sure to join one and that you join the same one as the rest of your team! You can also use check groups to see who has a full team and who does not! This is helpful if you are still looking for team members.

The competition weekend begins with the opening ceremonies where we'll go over all the important details you need to know for the weekend and receive a keynote address from our platinum sponsor, Konrad. To attend the opening ceremony, join through the BB Collab Page on the course! After the ceremony is over, you will transition to breakout rooms and your competition directors will introduce the problem statements to you.

All questions can be asked through the Discussions Page on Quercus or by email to your competition director. A list of important contact information is available at the end of this package.

3.0 PLATFORMS

There are two ways to submit your solution depending on your competition. The first is through the Assignment Page. As part of a group, only one member will need to submit for all of you. The second way is through Quizzes. Some competitions will allow you to access the problem statement for a set amount of time no matter when you start. At the end of the allotted time, you must submit your solution through the quiz. Your competition director can provide more detail on the correct way to submit.

If you and your team make it to the second round of the competition on Sunday, you will present to the judges through breakout rooms in BB Collab. All competitors are expected to have access to a webcam, microphone, PC or Laptop.

There will be enough breakout rooms during competition weekend for each team to work throughout the Saturday. As we are in unique times, we hope to grab a few screenshots of each team working to remember this UTEK by! **We ask that you and your teams also take pictures and videos of your weekend (as many as you like) and submit them to this google form!** <https://forms.gle/sWGVue8ib5R7oGRS9/> During your presentations we will also be taking pictures. **If you do not want your picture taken, please email marketing@utek.skule.ca.**

4.0 NETWORKING & SPONSORS

From 10-11am, you and your team will have the opportunity to interact and network with our sponsor companies. Don't miss out on this great opportunity as these companies were specifically interested in meeting with you!

Each company representative will be accessible through BB Collab breakout rooms through which you can rotate and network.

If you are interested in having your resume shared with our sponsor companies, please submit through the assignment open on the course.

Competitions Rules & Descriptions

5.1.0 Parliamentary Debate

The goal of the Parliamentary Debate Competition is to encourage undergraduate engineering students to present a well-reasoned viewpoint with a minimum of preparation time. Engineers are often required to evaluate and argue for or against a proposal on short notice. In this category, competitors defend or refute a previously undisclosed resolution using the format of a parliamentary style debate.

5.2.0 Competition Schedule

5.2.1 Competition logistics

This year UTEK will be hosted both online and in person. The parliamentary debate competition will run synchronously throughout the second day of UTEK.

The competition schedule will be sent to all the competitors by email at least 24 hours before the first round. The competition will likely follow a bracket style tournament format. However, this is yet to be determined after assessing the time zone distribution of competitors.

Resolutions will be announced via email prior to the round. Teams will have 30 minutes to prepare on their own. The first place team (or highest performing team with at least 50% engineering students) will represent the University of Toronto at the Ontario Engineering Competitions (OEC).

5.2.1.1 Competition Personnel

Judges: An odd number of judges, each with equal voting strength (1 ballot per judge), will determine the winner of each debate. One among the judges shall adopt the role of speaker to verbally conduct the debate.

Timekeeper: The timekeeper ensures that the debaters stay within the allotted time limit. The timekeeper informs the speakers of specific time intervals using hand signals.

Speaker: The Speaker/Chair of the debate ensures the rules of the debate are understood and followed by both the judges and the competitors in the room. The speaker assumes a leadership role in the provision of feedback to competitors at the end of the round.

5.2.2. Protocol for online debates

Communication guidelines

- Everyone except the current speaker must remain muted throughout the debate.
- The raise hand feature will be used to ask for POIs to avoid cutting off the speaker's audio. If the speaker does not see it / acknowledge it within 45 seconds, the opposition can unmute and raise the point of information out loud.

We cannot monitor if competitors break the rules and use the internet to research during the debate. However, we will be instructing judges to place a greater emphasis on the logic, clarity and delivery of the arguments presented and to disregard any supporting evidence that goes beyond the scope of common knowledge.

Protocol for poor connectivity

In the case that poor internet connection interferes with the debate here are the following actions we will take.

1. Participants in the call will turn off video cameras to reduce bandwidth.
2. The participant with poor internet will be given 3 minutes to attempt dialing in (if that's an option).
3. The participant's partner will take over from where they left off.
4. If neither team member can continue, the other team will be given the option to articulate the rest of their arguments. Both teams can choose to submit a roadmap / outline of their main arguments right before the round starts. Judges will primarily judge the strength of the arguments and its delivery on the call, but can choose to consider this when awarding marks in case the round ends prematurely due to poor connection.

5.3.0 Resolutions

In teams of two, participants engage in a parliamentary debate on the ethical, social and environmental implications of engineering-related resolutions. The resolution topics are related to science, engineering, technology, education but are general enough to not require detailed prior knowledge of the subject matter.

Teams will be assigned Government and Opposition. The resolution will be revealed at the start of the debate. Teams will have thirty (30) minutes to prepare their initial arguments. The Government will be given the task of preparing an initial argument defending and arguing for the resolution. The Opposition will be given the task of preparing an initial argument refuting and arguing against the resolution.

Teams may NOT use the internet during the process of preparation.

Stopwatches, writing pads and other tools are allowed at the discretion of the judges and the director. Cellphones are allowed as substitutes for stopwatches, but not for research.

5.3.1 Accessibility (theme) Considerations

Resolutions topics will have an accessibility theme, though it is not critical that participants defend their resolution exclusively from that perspective.

5.4.0 Rules

5.4.1 Speaker format

Team/Speaking Time	Speaker Title	Role
Government 5 minutes	Prime Minister (PM)	Build Government's case by presenting a number of arguments.
Opposition 5 minutes	Member of the Opposition (MO)	Introduce Opposition arguments, rebut Government's case.
Government 5 minutes	Minister of the Crown (MC)	Introduce Government's final arguments, rebuild Government's original arguments and rebut Opposition's arguments.
Opposition 5 minutes	Leader of the Opposition (LO)	Introduce Opposition's final arguments, rebuild Opposition's original arguments, and rebut Government's case.
Opposition 2 minutes	Member of the Opposition (MO)	Rebuild critical aspects of Opposition case and sum up entire debate by showing why the Opposition has won the debate.
Government 5 minutes	Prime Minister (PM)	Rebuild critical aspects of Government case and sum up entire debate by showing why the Government has won the debate.

Any debater exceeding the time limit will be granted fifteen (15) seconds grace to finish their

thought, after which they must sit down. After this time, judges, timekeepers, speakers, and the opposite team are to bang the table in such a fashion that nobody can hear the debater until the debater sits down. No penalty is to be imposed if the debater sits down promptly after their grace time expires. Debaters who use significantly less than the allotted time will not be assessed a timing penalty. However, debaters who speak for less than their allotted time are likely to do worse by not having said as much as they could.

5.4.2 Detailed speaker roles

5.4.2.1 Prime Minister Constructive (PMC):

Introduce the issue by stating and briefly describing the problem you wish to solve or the side of a philosophical issue you wish to defend.

- Introduce the issue
- Case statement: one or two sentences outlining what you, the Government, propose.
- Roadmap your arguments. For each argument, state the point and flesh out your argument with proof. The more your case is based on logic and observable knowledge, rather than numbers, the stronger your case is.
- Conclude by summarizing your case and the arguments you brought up. Reiterate the most important thing in this round.

Strategic point: your purpose is to introduce a strong Government case with confidence and clarity, setting the right tone for the debate and forcing the Opposition to work hard to bring you down. Bury a weak point in the middle of your speech, making sure to leave a strong one for the MC.

5.4.2.2 Member of the Opposition (MO):

- Take the case the Government presented and explain why their solution cannot work, or why the problem doesn't exist.
- Present new, independent arguments relating to the case. Your argument is for the opposite of the government's case, bringing it down.
- Crash and Burn(Refutation): Go through each of the PMC points and explain why they fall.

Strategic point: your purpose is to introduce the Opposition stance (the crux of the Opposition case) and to bring down all that the PM just said, making it difficult for the MC to rebuild.

5.4.2.3 Minister of the Crown (MC):

- Bring forth an additional one or two arguments supporting the government – this is not mandatory
- Go through the points presented by the MO and rebut them. Take issue with their

assumptions and challenge their premises. Try to take the MO out of the round!

- Reconstruct the PMC points that were refuted by the MO. Clean up the mess left in the last speech and explain why the MO is wrong. Go through each of the PMC arguments, say what the MO said about them, and prove why they still stand.

Strategic point: Make sure not to spend too much time on constructive argumentation. Make your reply speaker's life easier by remembering to rebut the Opposition's case!

5.4.2.4 Leader of the Opposition (LO):

- Introduce the bulk of the opposition arguments. Try to maintain thematic consistency, following the stance introduced by the MO but developing it much further with your 3 or 4 points. In general, try to have as many arguments as the PM had.
- Reconstruct the argument(s) presented by the MO.
- Go through each Government argument and destroy it. Challenge the logic, the assumptions, the feasibility, etc. At the end, none of the strong Government points should be standing.
- Refute the Government's strong points and highlight your strong points. Explain why you deserve to win.

Strategic point: Pace yourself carefully, and watch the time signals. Make sure not to spend too much time on constructive argumentation. Reconstruction is key!

5.4.2.5 Member of Opposition Rebuttal (MOR):

- Take the two or three strongest points against you and rebut them.
- Conclude by returning the debate to the thematic principles you outlined in the MO speech. ☐ Explain why you win.
- Note: new arguments cannot be presented in the MOR.

Strategic point: Look at the round more generally. Talk about the theme of the round, the strongest couple arguments, and why the Opposition has done a better job. End strong!

5.4.2.6 Prime Minister Rebuttal (PMR):

- Take the two or three strongest points against you and rebut them.
- Conclude by returning the debate to the thematic principles you outlined in the PMC. ☐ Explain why you win.
- Note: new arguments cannot be presented in the PMR.

Strategic point: you do not have time to go through every argument in the round, so do not attempt this!! If you can, organize your speech into the main three issues/types of arguments. Take each issue, say a few things about what was said by each side, and show how the balance swings in your

favour. End strong!!

5.4.3 Points of Information

POIs are opportunities for you to raise during your opposition's speeches and offer a question or comment. By saying "Point of Information" and displaying correct form (one hand on your head, one hand held out palm up), the speaker knows you are interested in stealing the floor. They can accept your POI or decline it by waving you down or saying, "No thank you." You can use the POI to clarify something about which you are confused, point out a flaw/contradiction in the speaker's argument, or make a comment that will link to something you will talk about later.

It is important to keep the POI brief and to the point (5-15 seconds), but also to keep yourself in the round with both strong use and reception of POIs.

*The general rule in a round of debate: Give Two, Take Two

*Protected time: POIs cannot be offered during the first and last minute of constructive speeches. In the LO speech, POIs cannot be offered in the last three minutes, and the entire PMR is protected.

Teams that do not take POIs should be penalized for demonstrating an unwillingness to engage with the opposite side.

5.4.4 Tight Cases

As the Government team is given the opportunity to define the case, it is also their obligation to ensure that the case they set is debatable from either side. If a case set by the government is inherently one-sided, the quality of debate will suffer, and judges know to penalize government for that. When constructing cases, try to imagine what the opposition case would be for the motion. If there is no opposition case that could closely compete with the government, it is likely too tight a case.

5.4.4.1 Dealing with a tight case on opposition

When hit with a tight case on opposition, it is best to deal with it as graciously as possible, while still calling the judge's attention to the fact that it is a tight case (the judge cannot penalize government as heavily for a tight case if you do not make the "tight call"). Open your speech with an explanation of why the case is tight by weighing possible opposition arguments to government arguments and displaying how even the best opposition case would not be enough to match the government. After having made your tightcall, proceed to make the OPP case as you normally would. (Just because a case is tight, and you identify it, doesn't mean you've automatically won: you still have to try to "play ball" with the motion you've been given). Moreover, this is the most strategically sound idea because if the judge does not agree with your tight call, at least you give yourself a chance at willing the debate.

5.4.5 Timekeeping

- The timekeeper's main role is to signal the end of their allotted speech time by banging on the table twice, and then banging on the table continuously at the conclusion of their grace time
- The timekeeper should also display how many minutes debaters have left by holding up fingers equal to the number of minutes left
- For example, 1 minute into the first speech, the timekeeper should hold up 1 finger to indicate 1 minute has passed. The timekeeper is not expected to hold their hands up continuously

5.5.0 Judging

Debate should be judged holistically. There are multiple approaches to being the most persuasive, and what is effective varies greatly from situation to situation. Therefore, judges should not follow a strict rubric. I've spelled out a few guidelines below, but the key is to judge holistically so that the best team of debaters wins.

Judges should **first assess who won on a holistic basis before ranking the debaters based on their persuasiveness**. Only then should judges assign scores to the debaters. When assigning scores, judges should ensure that they reflect the rankings and that the winning team's combined score is higher than the losing team's.

Generally, persuasive teams will be the teams that clearly outline their arguments and are easy to follow. Moreover, they typically engage with the other side's ideas and talk about the big issues. This is not because outlining your speech at the beginning is good in and of itself, or that saying the word "refutation" suddenly make them a better debater. However, these guidelines are there because clearly understood teams typically do better than unclear teams and strong responses to the other side generally increases persuasiveness.

65-68 – You should not give scores in this range unless the debater was offensive, did not attempt to give a proper speech, or refused to speak.

69-71 – This debater has a long way to go. They may have presented one or two good ideas but were clearly below average.

72-74 – This debater was better than the 60-69 range, but still had several major flaws. They were below average.

75 – This debater was average. They have several clear flaws, but also had some strengths in their speech.

76-78 – This debater was clearly above average but was not exceptional.

79-80 – You expect this debater to be the best speaker at this tournament. They were exceptional in every regard.

80-82 – This debater gave the best speech we will hear in UTEK for the next 10 years. The speech

had no flaws, was rhetorically brilliant, and was one of the most persuasive things the panel has ever heard. These scores should not be given out.

*For reply speeches, the speakers are to be scored half of what they would obtain in a constructive speech. The scoring range changes to 33 - 41.

5.5.1 Online considerations

Since we cannot proctor the use of internet research during the debate online, we remind judges that points should be awarded based on the logic, clarity and presentation and disregard supporting evidence that goes beyond the scope of common knowledge.

Participants in the call should follow the protocol in 2.2 in case of poor internet connection. Participants should not be penalized for poor internet problems. If the debate ends prematurely due to poor connectivity, judges will award points based on the debate thus far and an outline of the arguments if the disconnected team chooses to provide one.

6.1.0 Innovative Design

The objective of Innovative design competition is to gather engineering students' new ideas to tackle current world issues. Competitors aim at solving a real-world problem or improving an existing engineering design by providing innovative solutions or by introducing new technologies.

6.2.0 Competition Schedule

The competition will be delivered online this year. The competition will be conducted using Quercus. The competition deliverables will be due on 8pm, January 16. Refer to 6.0 for details.

The schedule, accounting for other UTEK events will be as follows:

TIME	January 16th, 2021
11:00 am - 11:15 am	Problem Statement Briefng
8:00 pm	Submissions due (summary, poster, presentations)
11:59 pm	Participants will be notified by this time on whether they've advanced to the judges round on Day 2. Presentation schedule will be released at this point.

TIME	January 17th, 2021
10:00 am - 12:00 pm	Presentations & Judging
12:00 - 1:00 pm	Lunch
1:00 - 3:00 pm	Presentations & Judging Continues
3:00 - 4:00 pm	Closing Ceremony
4:00 - 5:00 pm	Networking & Judge Feedback

6.3.0 Preliminary Rules

- University of Toronto students of all years and all disciplines are eligible for the registration of 2021 UTEK innovative design competition.

- Competitors will compete as a team of 1-6 people
- Presenters must send a **300 word summary** of their innovative solution, **1 page poster** and a **video recording of their presentation** by 8:00 p.m. on January 16. (*Video presentation will be used by judges to assess in the case of technical difficulties during the live presentations.*)
- The summary must include the team name, team members, design topic and description
- Poster must include team members, project title
- Format for both summary and poster must follow: 12 pt font, 1 inch margins, 1.5 line spacing
- The presentations must not exceed 20 minutes. During the live presentation, warnings will be given at 5 min before the time is up and 1 min before the time is up.
- Presenters must remain ready to share their visuals and video on the **quercus page** (BB collaborate) at least **5 minutes before** their scheduled presentation. The judges will let competitors in in their scheduled slot, after the presentation should promptly begin.

6.4.0 Innovative Design Background

- 1 The objective of Innovative Design competition is to prepare research and develop an innovative design to address a void in society or a current world issue. The project should be technical in nature and the presentation should assess social, environmental, and economic ramifications.
- 2 *Competitors aim at solving a real-world problem or improving an existing engineering design by providing innovative solutions or by introducing new technologies.*
- 3 The development, research, planning and execution of ideas have to be done **outside** the competition time. Eventually, each team will **submit one complete project** (e.g thesis, capstone, summer research, design projects, side projects) containing an innovative solution to an existing problem or engineering design **prior** to the competition commencement. Each team will also present their project to a panel of judges, and the project will be judged based on several criteria including project originality and practicality.

6.5.0 Design Problem and Goals

This competition allows for open-ended creativity with the only condition being that it must make accessibility the focus of its design. Each project must contain 3 parts:

- 1 Recognition of the existing problem or engineering design, keeping in mind accessibility considerations
- 2 Providing an innovative design solution to the problem
- 3 An assessment of the feasibility of the innovative design (including but not limited to 4) aspects:

1. Technical ramification of the innovative design solution
2. Social impact of the innovative design solution
3. Economic impact of the innovative design solution
4. Environmental impact of the innovative design solution

6.5.1 Design Presentation

Using well designed visual aids, each team will give a **20 minute presentation** to a panel of judges, followed by a **10-minutes question period**. The schedule for the day of the competition will be sent to participants by the Innovative Design Director.

Each presentation must address 4 aspects:

- The team's recognition of an existing problem or engineering issue
- The technical aspects of the team's innovative design
- The feasibility of the team's innovative design (including but not limited to four required aspects mentioned above)
- The team's adherence and holistic approach to justifying design accessibility considerations

Technical Difficulties Arrangement

This year will be UTEK's first ever virtual kompetition! As such, to ensure technical difficulties don't impact your chances, please send a recording of your presentation no later than **8 p.m. on January 16**. In the event of technical difficulties (ie/ wifi goes down during your live presentation) judges will assess you based on your sent recording.

Approved visual aids:

At a virtual session, the list of approved visual aids include, but are not limited to:

- Online presentations (teams must check compatibility with software being used)
 - Powerpoint, Prezi, flowcharts etc.

6.6.0 Competition Deliverables and Presentation

Each team is required to submit a 300 word summary, poster of their innovative design solution, and a video recording of their presentation (max 20 mins) **by 8:00 PM on January 16 (Day prior to presentation day)**. Please submit the submission through Quercus (one person may submit per team).

Submissions will be reviewed and successful teams will be notified by 11:59 p.m. on Day 1 on whether they will be proceeding to the judges round on Day 2. The presentation schedule will also be released at this time.

For those who proceed to the next round, their submitted summaries will be given to the judges for them to gain a general overview of the design prior to the start of judging. **The presentations will run from 10:00 a.m. to 3 p.m. on January 17th.** Teams must be ready to share their screen and present via BB Collaborate at least 5 minutes before their allotted presentation time. The schedule for the presentations will be sent to qualifying participants by the Innovative Design Director by 11:59 p.m. on January 16.

6.7.0 Rubric

Content of the presentation and summary		
Judging Criteria	Questions to Address	Score
Justification of the proposed design solution	<ul style="list-style-type: none"> Was the justification of the proposed design valid and understandable? Was their adequate detail in the design solution to effectively address all points of the issue? 	/10
Feasibility of the proposed design from four required aspects	<ul style="list-style-type: none"> Was the technical ramification of the innovative design solution addressed in detail? Was the social impact of the innovative design solution addressed in detail? Was the economic impact of the innovative design solution addressed in detail? Was the environmental impact of the innovative design solution addressed in detail? 	/10
Consideration of Alternative Viewpoints	<ul style="list-style-type: none"> Were alternative viewpoints of the issue discussed? How were these alternatives used to strengthen their viewpoint? 	/10
Cohesiveness of the proposed design	<ul style="list-style-type: none"> Do teams sufficiently understand the existing problem? Was enough research done to fully comprehend the whole problem? How well does the proposed design address the existing issue? 	/15
Innovativeness/originality of the proposed design	<ul style="list-style-type: none"> Is the topic an innovative revisit of a known issue or is this a fresh new idea/topic? Does the solution have new, creative, and potentially never seen before elements to address the issue? 	/5
Visual Design of Poster	<ul style="list-style-type: none"> Is the poster visually appealing? Does it accurately portray the innovative design? 	/10

Presentation Delivery		
Judging Criteria	Questions to Address	Score
Speaker Quality	<ul style="list-style-type: none"> • Was the speaker clear and concise with his/her delivery? • Was the speaker using intonation, emphasis and monitoring tone effectively? 	/10
Organization	<ul style="list-style-type: none"> • Was emphasis given to appropriate areas? • Did the seminar flow naturally from point to point? • Was time used appropriately? 	/10
Visual Aids	<ul style="list-style-type: none"> • Were the audio-visual aids used appropriately? • Did they help illustrate key points? • Were the slides or overheads clear and easy to read? 	/10
Interaction/Engagement with Judges	<ul style="list-style-type: none"> • Was the speaker able to engage the audience? • Was the speaker able to direct attention to key details/problems they addressed in their design? 	/5

7.0 Communications

The Communications Competition is open to ALL undergraduate students in the University of Toronto. Participants work in teams of up to 2 people to come prepared with a half hour presentation, aiming to explain an engineering or scientific concept to the judges. The key here is all about 'COMMUNICATION', as the highest point goes to participants that are able to coherently and concisely communicate their topic.

Competition Schedule and Deliverables

The competition will be delivered online this year. The competition will be conducted using Quercus. The submission will be due by 8 pm on January 16. The team will select a team member to start the Quercus quiz and submit the following files:

- 200 word abstract detailing your solution for the judges to review and mark
- The summary must include the team name, team members, design topic and description\Format must follow: 12 pt font, 1 inch margins, 1.5 line spacing
- Presentation slides
- Final presentation recording (Will be used to assess competitors in the case of technical difficulties during the **live presentations scheduled for January 17, 2021.**)

Submissions will be reviewed and successful participants will be notified on whether they've qualified for the judges round by 11:59 p.m. on January 16. At this point, the live presentation schedule for Day 2 of the competition, January 17, will be released.

The schedule, accounting for other UTEK events will be as follows:

TIME	January 16th, 2021	January 17th, 2021
9:00 am	Opening Ceremony with	
10:00 - 10:45 am	Networking	
10:45 - 11:00 am	Problem Statement	
11:00 am - 12 pm	Begin researching, creat-	
12:00 pm	LUNCH	
1:00 pm	Continue working on your presentations/abstract	Presentations & Judging
3:00 - 4:00 pm		Closing Ceremony
4:00 pm - 5:00 pm		Judge Feedback
7:00 - 8:00 pm	Submit all required files on	
11:59 pm	Successful participants	

Objective

The purpose of the Engineering Communication competition is to challenge students to develop and present a well-supported perspective on a technological problem. The problem must pertain to audiences with or without technological backgrounds and must highlight the impact of the issue in today's society. The presentation shall include the issue's environmental, social, economic and other relevant impacts. The top competitors will have done thorough research, can support a convincing point of view, and deliver a dynamic presentation.

Registration Criteria

1-2 competitor(s) per team. Abstracts must be submitted before the competition so they can be made available to the judges.

Presentation Format

Presentation (Maximum 20 Minutes)

Each team has up to **20 Minutes** to present and explain the details of the technological issue. Visual aids such as a powerpoint presentation should be used as part of the presentation. These presentations will run between 10:00 am - 3:00 pm on **January 17**. The schedule will be released by 11:59 pm on January 16 by the communication director.

Question Period (Maximum 10 Minutes)

There will be a 10 minute question period for judges to ask competitors questions.

Technical Difficulties Arrangement

This year will be UTEK's first ever virtual kompetition! As such, to ensure technical difficulties don't impact your chances, please send a recording of your presentation no later than 8 p.m. on January 16. In the event of technical difficulties (ie/ wifi goes down during your live presentation) judges will assess you based on your sent recording. In the case of wifi interruptions where keeping the webcam on is compromising audio clarity, we request that you turn off your cameras to reduce bandwidth and hopefully restore audio.

Problem Statement

Accessible design is defined as the characteristic that products, services and facilities can be independently used by all people to the greatest extent, without the need for adaptation or specialized design. This year, the Engineering Communication competition challenges students to develop and present a well-supported perspective on a technological problem that is related to accessibility. The presentation must pertain to audiences with or without technological backgrounds and must highlight the impact of the issue in today's society. In addition to focus on the accessibility aspect, the presentation should also include the environmental, social, economic and other relevant impacts.

Rubric - Judging Matrix

Content (Based on presentation (primarily) and abstract)		
Judging Criteria	Questions to Address	Score
Explanation of Concept	<ul style="list-style-type: none"> Was the explanation of the Topic/Issue clear and complete? 	/10
Delivery of Viewpoint	<ul style="list-style-type: none"> Was the significance/importance of the issue discussed? Were the arguments sufficiently supported? 	/10
Consideration of Alternative Viewpoints	<ul style="list-style-type: none"> Were alternative perspectives of the topic discussed? How was this alternative used to strengthen their viewpoint? 	/10
Understanding of Topic	<ul style="list-style-type: none"> Do teams sufficiently understand the topic? Was enough research done to fully comprehend the whole issue? How relevant is the presentation to the theme "ACCESSIBILITY?" 	/15
Innovation of Topic	<ul style="list-style-type: none"> Is the topic an innovative revisit of a known issue or is this a fresh new idea/topic? 	/5

Presentation Delivery		
Judging Criteria	Questions to Address	Score
Speaker Quality	<ul style="list-style-type: none"> • Was the speaker clear and concise with his/her delivery? • Was the speaker using intonation, emphasis and monitoring tone effectively? 	/10
Organization	<ul style="list-style-type: none"> • Was emphasis given to appropriate areas? • Did the seminar flow naturally from point to point? • Was time used appropriately? 	/10
Visual Aids	<ul style="list-style-type: none"> • Were the audio-visual aids used appropriately? • Did they help illustrate key points? • Were the slides or overheads clear and easy to read? 	/10
Interaction/ Engagement with Judges	<ul style="list-style-type: none"> • Was the speaker able to engage the audience? • Was the speaker able to direct attention to key details/problems they addressed in their design? 	/5

8.1.0 Re-Engineering

The re-engineering competition will test competitors on their ability to take an existing concept, product, technique, or technology, and incrementally improve on its design to suit an alternative situation or application. Competitors are to add or enhance functionality to better suit the user or be applied to an alternative situation. This competition will challenge the competitors to work under a constrained time, teamwork abilities, and technical capabilities. The design will showcase the team's innovative thinking with their presentation to judges.

8.2.0 Competition Schedule

Date	Details	Time (EST)
January 9th	Case 1 - First case released	9:00
January 16th	Start of competition design time	9:00
	Case 2 - Second case released	9:00
	End of competition design time Reports and presentation submission required	18:00
January 17th	Presentations	9:00 - 12:00

8.3.0 Rules

8.3.1 Team

The team can have up to a maximum of two (2) undergraduate students. To qualify to move onto OEC, at least one competitor in the team must be an engineering student.

8.3.1 Procedure

8.3.1.1 Case Structure

There will be two (2) sets of written cases to this competition. The first case will be released one week in advance, January 9th, of the beginning of the competition design time. Competitors are re-

quired to complete the first case using as much time they feel necessary, by the end of the competition design time. The second problem will be released to competitors at the beginning of the competition design time, and is also required to be submitted by the end of the competition design time.

8.3.1.2 Question and Answers

All competitors will have access to the re-engineering discussion board to post their questions for both cases for competition directors to answer only.

8.3.1.3 Competition Design Time

Teams will have eight (8) hours to develop their solutions, and produce all required deliverables, and prepare their presentations. All deliverables must be submitted before the end of the competition design time. Competitors can submit before the end of the competition design time. It is recommended for competitors to finish the report and presentation slides to the first case prior to the beginning of the competition weekend.

Competitors are encouraged to develop a model using Fusion 360 for case two (2). Fusion 360 basics tutorial can be found on utek.skule.ca under workshops. Fusion 360 is free to download [here](#), or can be accessed through ECF remote desktop. Competitors that are able to develop a model and incorporate the visual aid into the presentation will be awarded points.

8.4.0 Accessibility Considerations

When submitting the final reports and presentation please try to submit at least five (5) minutes before the deadline. If any issues occur with the internet, email us or send a message on Quercus immediately. For presentations, please enter the room at least ten (10) minutes before the beginning of your presentation to receive presenter permissions and to test internet connectivity.

If during the presentation, audio cuts out, or internet connectivity fails, timer will be halted until the competitor can reconnect. If it's best that the competitor must turn off their video, they must indicate this to the judges.

8.5.0 Presentation

Competitors will be given twenty (20) minutes to present their proposed solutions through BB-collab to be evaluated by the judges. All team members must present or points will be deducted.

Judges can ask any questions during the presentation, and time will be halted during this. Judges will also have ten (10) minutes to ask questions at the end of the presentation.

During the presentation, a five (5) minute and a one (1) minute warning will be indicated and competitors must conclude the presentation when the twenty (20) minutes is over. Competitors cannot include material in their oral presentation that is not included within their submitted written reports or presentation materials.

8.6.0 Competition Deliverables

Competitors must submit their reports, and presentation through Quercus under assignments.

The format of both reports should be as follows:

- 1 page excluding cover page, references and appendices
- 1.15 line spacing, font size 12, Times New Romans
- 1 inch margins
- Citations in APA, MLA or IEEE style

The submission of the report must be in PDF file format and the presentation should be either PPT or PPTX file format. Name the file as following:

team#.report[1/2].pdf

team#.presentation.[ppt/pptx]

Late submissions will not be accepted and improper citations will result in deducted points.

8.7.0 Rubric

Solution (60%)	Case 1	Case 2
Proposed Changes Design has new or enhanced functions that are an improvement for the user and is justified with evidence	/5	/10
Technical Characteristics Size, weight, material are appropriate for user and environment	/5	/10
Social and environmental feasibility Addresses accessibility concern through creative, innovative design, and is feasible in stakeholder environment	/5	/10
Economic Feasibility Cost, production, marketability is considered and justified	/5	/10

Report (15%)	
Content Quality Design is descriptive, concise and addresses accessibility concerns	/5
Organization/ Clarity Report contains all relevant details of the design	/5
Writing style/ Proper citations	/
Presentation (25%)	
Voice, articulation and Timing	/10
Visual Model For case 1, the presentation includes appropriate visual aids (5 points) For case 2, included a well designed model using AutoCAD or any other modelling software (5 points)	/10
Response to Questions	/5
Deduction total	
Total Score	/100

8.8.1 Penalty Matrix

Point Penalties	
Plagiarism	Elimination
Insufficient Citation	-50
Documents Received After Deadline	-50
Absent Team Member	-25
Verbal Disclosure of School During Presentation	-10
Disclosure of School in Presentation Files/Documents	-10
Wearing School Apparel During Presentation	-50
Entering presentation room before allotted time (after first offense)	-10
Report Specifications are not followed (-10 per case)	-10
Total	

9.1.0 Programming

In this competition, you will solve a programming challenge, compete with other teams, and end with a presentation on your solution. Teams are evaluated based on practicality, ease-of-use, and capability of their coded solution. We are looking forward to your participation. Let the games begin!

9.2.0 Competition Schedule

The competition will be delivered online this year. The problem statement will be released on the day of the competition. The competition will be conducted using Quercus. The competition will be made available from 11 to 8pm. The team will select a team member to start the Quercus quiz and submit all the files. Once that team member starts the quiz, the team **will have 8 hours to complete the coding challenge and submit the slides**. The coding challenge, described in the problem statement section of this document, should take 6 hours to complete. The presentation should take 1-2 hours to complete.

9.3.0 Rules

- Students from **all years** can participate in the competition.
- You can **only** collaborate with the members of your team.
- You can use **any programming language and its standard libraries** to solve the given problem (eg. if there is a Python package needed to be installed that does Breadth First Search for you, it cannot be used. If there is a standard list sorting function, it can be used)
- There can be a **maximum of 4 University of Toronto students** in a team.
- In order to participate in the 2021 Ontario Engineering Competition, at least half of the team must comprise engineering students. In order to participate in the Canadian Engineering Competition, the entire team must comprise engineering students.
- You are allowed to use online resources and the resources mentioned in the zip file provided to you. All the online resources used by competitors must be cited in a references slide at the end of the presentation (in whichever academic citation format they select). Competitors are not permitted to submit work completed by anyone other than the members of their team. If they decide to recycle their own or someone else's code it must be **clearly cited** in the presentation.

9.4.0 Competition Deliverables

You are responsible for submitting your code, input and output files in a zip file on the Code section of the Quercus quiz before your deadline. The zip file should be named TEAM_NUMBER.zip. The

README file should contain instructions on how to run each part of your code. For example if the team programmed in Python, the zip file should contain:

Failure to submit all the files in a correct format will result in deduction of points.

You are furthermore required to create a 10 minute presentation. Your presentation slides along with your code, should be submitted on the Presentation section of the Quercus quiz. If you submit multiple times, then your most recent submission will be considered. In case the participants face a problem during submission they should immediately contact the Programming Co-Directors through the Quercus discussion board.

	Time	Additional Information
Team Presentation	10 minutes	Reminders will be given at 3 minute, 1 minute, and 30 second marks. There is a grace period of 30 seconds, after which the presenters will be cut off.
Judges Q&A	5 minutes	All members of the team must be ready to answer questions.

9.5.0 Rubric

Teams will be responsible for uploading their solution to each section of the problem, as well as the outputs to their programs in a file. We will use scripts that will grade each team by parsing through their outputs. Representatives from OEC will judge the presentations. There will be a penalty for plagiarized content, absent teammates and late submissions.

Presentation Rubric

Category	Points	Details
Well-justified	50	Explanations are detailed, and your reasoning is backed with examples.
Presentation	30	The presentation should be easy to follow and flow naturally. Competitors should be prepared to answer questions on their solution.
Choice of visuals	20	Your choice of visuals should make a meaningful contribution to the presentation.
Total	100	

Criteria	4	3	2	1	Total
Correctness					/12
Syntax and bugs	Code compiles without errors or warning and no runtime error occurs	Code compiles without errors or warnings and non-fatal runtime errors occur	Code compiles with errors and runtime errors occur	Code does not compile	
Output	Output is exactly correct for all test data	Output is mostly correct except for corner/special cases	Output is correct for simple cases	Output is not correct	
Efficiency	Code is most optimal and able to run on large data sets	Code is able to run on normal sized data sets	Code can only run on small data sets	Code can only run on very small data sets	
Quality					/16
Readability	Code is well indented and spaced and easy to follow and trace	Code is mostly well indented and spaced and easy to follow and trace	Code is indented and spaced	Code is not indented or spaced	
Modularity	All processes are logically subdivided into reusable modular components (classes, functions) that are then linked together	Most code is logically divided into reusable, modular components.	Some code is logically divided into reusable, modular components.	Code is not modularized, multiple processing steps are conducted in a single method/function and code is not re-usable at all.	
Naming and Naming Conventions	All methods and variables are named in a logical, and in an understandable way (pertaining to its role) and moreover, a strict spelling convention is always followed	Most methods and variables are named logically and a strict spelling convention is always followed	Some methods and variables are named logically and a spelling convention is mostly followed	Method and variable names are arbitrary and there is no spelling convention	
Error Handling	All possible exceptions are caught and handled or all possible errors	Most possible exceptions are caught and handled	Some exceptions are caught and handled	No error handling	

10.1.0 Consulting

In the consulting competition, teams of up to four current undergraduate students from the University of Toronto are given an engineering problem. The goal is to then develop and present a logical solution to a panel of judges to demonstrate their understanding of the problem and awareness and consideration of the social, environmental, technological and economic impact of the proposed solution.

10.2.0 Competition Schedule

Day 1

	Time	Additional Information
Report Working Time	11:00 - 6:00 pm	Teams will be given time to create their solution and report
Presentation Working Time	6:00 - 8:00pm	Teams are given time to create their powerpoint presentation

Day 2

	Time	Additional Information
Team Presentation	10 Minutes	Reminders will be given at 3 minutes, 1 minute, and 30 seconds. There is a grace period of 30 seconds, after which the presenters will be cut off. All team members will be required to speak.
Judges' Q&A	5 Minutes	All members of the team must be ready to answer questions
Judges' Marking	5 Minutes	Judges will take this time to confer and mark the teams
Judges' Feedback	5 Minutes	Judges will give feedback on the presentation and ways to improve next time

10.3.0 Rules

Participants are allowed to have internet access on their own electronic devices during the competition and are encouraged to conduct research to support their design. Participants may work any-

where, and they may only ask questions during the competition through the UTEK Consulting Quercus page.

All teams will be marked based on their report submission, and only 4 teams will advance to the presentation stage on Day 2. All teams will be informed whether or not they have advanced by midnight of Day 1.

10.4.0 Competition Deliverables

Report

On the first day of the competition, all teams will create and present their solution of the problem through a written report. The report must include a **title page with team number and member names**. The report must also have an **executive summary**. Participants should provide detailed descriptions of the solution's conceptual design, reasoning, and strategic planning. References used in the text must be cited properly; any citation method with in-text citation is appropriate.

The formatting for the report should be as follows:

- Maximum 6 Pages (Excluding Cover Pages, Table of Contents, Executive Summary, References and Appendices)
- Single-spaced text, 12-point font
- 1-inch margins (top, bottom, left and right)

All submissions must be formatted per following guidelines below and be submitted before the respective deadlines to the Consulting Quercus page (if you run into problems you can email it to consulting@utek.skule.ca). Only one submission per team is required. Late submissions will not be accepted.

Presentation

The teams that are selected to move forward must also submit a slide presentation summarizing the key aspects of the problem and the proposed solution. Teams that do not submit slides are not eligible for the presentation stage. The presentation time will be split as follows:

	Time	Additional Information
Team Presentation	10 Minutes	Reminders will be given at 3 minutes, 1 minute, and 30 seconds. There is a grace period of 30 seconds, after which the presenters will be cut off. All team members will be required to speak.
Judges' Q&A	5 Minutes	All members of the team must be ready to answer questions
Judges' Marking	5 Minutes	Judges will take this time to confer and mark the teams
Judges' Feedback	5 Minutes	Judges will give feedback on the presentation and ways to improve next time

10.5.0 Rubrics

Report Rubric (Evaluated by Directors on Day 1)

We are looking for a highly unique and feasible solution that successfully meets all the criteria of our client. Provide visuals and diagrams if they will enhance your solution.

Solution – 60 Points

Category	Detailed Criteria	Total Possible Points
Conceptual Design	Is the solution aligned with the goal of being cost effective?	20
	Does the solution cover all 3 categories listed?	
	Is the timeline for the solution realistic?	
Reasoning	Is the proposed plan well thought out and supported with convincing explanations?	40
	How feasible is the solution?	
	How well does the proposal address its own limitations and mitigate them?	

Report writing – 20 Points

Category	Detailed Criteria	Total Possible Points
Content	Are the details of the solution covered in the report?	7
	How effectively are claims supported?	
Communication	How coherent is the report?	8
	How well does the report leverage columns, tables, graphs, and pictures to enhance communication ??	
	Are there any grammatical or spelling errors?	
References	How well are the references integrated into the report's evidence?	5
	How credible are the references used?	

Possible Deductions

Penalties	Plagiarism Insufficient or improper citations Documents received after deadline	-50 -50 -50
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Presentation Rubric (evaluated by judges on Day 2)

Presentation – 60 Points

Category	Detailed Criteria	Total Possible Points
Solution	Is the proposed plan well thought out and supported with convincing explanations?	20
	How feasible is the solution?	
	How well does the proposal address its own limitations and mitigate them?	
Presenter Communication	How coherent and articulate are the presenters in explaining their solution	15
	How engaging and persuasive are the presenters	15
Use of Visual Aids	How effective are visual aids	10

11.1.0 Senior Design

Senior design competition challenges undergraduate students to collaborate in teams to address technological engineering problems using Arduino robotic kits and deliver their robotic design by achieving a task. Teams are encouraged to use their creativity and tools, like CAD or building a physical prototype, to achieve their design. Their performance will be evaluated on key features of their team's design, including novelty, practicality, and usability.

11.2.0 Competition Schedule

This year UTEK will be hosted online and is available in two versions: CAD competition or physical prototyping competition. Teams participating in the CAD senior design competition will have 9 hours to develop and present a creative CAD model that can address the problem. Teams participating in the physical prototyping senior design competition will have 7 hours on the first day of UTEK to design and build a physical prototype to address the problem.

On the second day of UTEK, all teams participating in the senior design competition will present their presentation slides to the judges.

First Day - Saturday Jan 16, 2021	
9:00 - 10:00 EST	Opening Ceremony with Keynote Speaker
10:00 - 10:45 EST	Networking
10:45 - 11:00 EST	Problem Statement Briefings and Q&A
11:00 - 18:00 EST	Solution Developing Stage
18:00 EST	End of Building Stage for Physical Prototyping Competition
18:00 - 19:00 EST	Testing
20:00 EST	Submission Deadline for Presentation Slides and Report for CAD/Physical competition.
Second Day - Sunday Jan 17, 2021	
9:30 EST	Testing and Presentation Schedule Release
10:00 - 12:00 EST	Presentation
12:00 - 13:00 EST	Lunch
14:00 - 15:00 EST	Presentation
15:00 - 16:00 EST	Awards & Closing Ceremony
16:00 - 17:00 EST	Judges feedback and Networking

11.3.0 Rules

11.3.1 General Rules

1. All teams must complete their design and building within the solution generating phase(7 hours for prototyping competition; 9 hours for online competition).
2. The physical prototype **must** be built with the materials provided by UTEK, which are included in the starter kit. Teams are not allowed to trade materials with other teams or use any additional electronic materials, but they may wish to use additional building materials, such as cardboards, popsicle sticks, foam boards, etc..
3. All work completed has to be original and completed by members of the team. When referring to other existing designs, teams must cite their sources.
4. For the physical prototyping competition competitors, failure to submit the presentation slides by **18:00**, will result in **immediate disqualification from the competition**
5. For the physical prototyping competition competitors, building outside the solution generating phase will result in **immediate disqualification from the competition**
6. For the CAD competition competitors, failure to submit the CAD file, one page report, and the presentation slides by **20:00**, will result in **immediate disqualification from the competition**

11.4.0 Marking Schemes

11.4.1 Physical Prototyping Competition Marking Scheme

<u>PROTO-TYPE</u>	Exceeds Expectation	Meets Expectation	Below Expectation	Little/No Value	Score
Creativity/ Uniqueness (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Scalability of Solution (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Accessibility (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Operational Feasibility (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Safety (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____

11.4.2 CAD Competition Marking Scheme

CAD MODEL	Exceeds Expectation	Meets Expectation	Below Expectation	Little/No Value	Score
Completeness (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Creativity/ Uniqueness (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Scalability of Solution (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Accessibility (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Operational Feasibility (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Safety (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____

11.4.3 Presentation Marking Scheme

<u>PRESENTATION</u>	Exceeds Expectation	Meets Expectation	Below Expectation	Little/No Value	Score
Clarity of expression (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Organization of ideas (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Showed evidence of mature judgment (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Effective participation of all team members (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Overall impression and responses to the judges' questions (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
PENALTIES Presentation exceeds the time limit					- 10

12.1.0 Junior Design

In this competition, you will be given a design challenge and provided with all materials needed. If you choose to compete in the **in-person** version, on the first day of the competition, your team will need to use basic engineering knowledge to solve the problem, provide a best-fit solution with a prototype, and test your prototype in the testing field provided by UTEK. On the other hand, if you choose to compete in the **online** version, you will be required to hand in a CAD model and a corresponding explanation document that describes your model. At the end of the competition, your team will also need to submit the presentation slides you will be using for your presentation on the next day if your team is chosen as the finalists. On the second day of the competition, six teams will be selected to present solutions to the judges using the presentation slides you submitted on the first day.

12.2.0 Competition Schedule

12.2.1 Competition logistics

This year's UTEK Junior Design Competition will have two different versions synchronously - in-person and online. The two competitions will be started at the same time but finished at different times as the online version will take more time on the prototyping section.

The competition schedule will be sent to all the competitors by email at least 24 hours before the actual competition day. We will make sure that all students can participate in this year's UTEK no matter which time-zone they are in.

If the team chooses to do it in-person, they should prepare a 5-7 minutes presentation on their own to fully explain the design (how you test the design) on the second day. A detailed description of the rubric can be found in the **Marking Scheme Section**.

If the team chooses to do it online, they should prepare a document that outlines all the functionalities in the design and a 5-7 minutes presentation on their own to fully explain the design (how you test the design) by the end of the first day. A detailed description of the rubric can be found in the **Marking Scheme Section**.

12.2.2 Judges & Competition Assistant

Judges: The Judges will consist of professors from UofT Engineering and other faculties and upper-year students who demonstrate academic excellence in the engineering design courses and are willing to help in the marking phase.

Competition Assistants: Charlie, Sabrina and a few enthusiasts will provide generous help throughout the competition. In addition, we will be monitoring the FAQ section on Slack throughout the competition. So if you have any questions, feel free to let us know!

12.3.0 Rules

The following rules detail the execution of the building, testing and judged prototype demonstrating. Failure to uphold all of these rules will result in loss of points and likely disqualification. Note that competitors are not allowed to watch other teams compete in the judged portion of the competition. Infraction of a rule tagged with an asterisk (*) results in an automatic disqualification.

General Rules

1. Both the in-person and online design and build stage is **6 hours** in duration.*
2. The use of the Internet is permitted in this competition.
3. The design must be built with the materials provided by UTEK.*
4. All information used by competitors must be referenced (included in the last slide in the presentation, i.e Reference Slide). Competitors are not permitted to submit work completed by anyone other than the members of their team.*

Design Rules and Requirements

1. Prototypes are not allowed to leave the competition premises unless they have been submitted to the competition staff/competition assistants.*
2. Teams may only use materials in the provided package.*
3. Provided tools may only be used to construct the prototype and may not be used as part of the prototype. The tools must be returned at the end of the design and build phase of the competition.*
4. The in-person prototype (video submission) must be submitted prior to 5:00pm.*
5. The online competition presentation must be submitted prior to 6:00 pm*

12.4.0 Competition Deliverables

Deliverables

- All designs must be completed in the 6-hours design period only. All prototypes must be visible during the presentation time and no work may be completed on them during this time.
- A prototype in strict accordance to the competition rules to undergo testing.
- An oral presentation outlining your solution, methodology and rationale.

Video and Testing Procedure

Selected Participants must submit a 10-minute video describing the team's proposed solution on the second day. The *Testing Procedure (a pdf file to hand in) must include a title page with team number and member names. The testing procedure serves as a user manual for your design (think about the user manuals you use to assemble IKEA furniture or electronic devices). Participants should provide detailed descriptions of the solution's conceptual design. For online participants, the procedure must explain the steps that the CAD model will follow to complete the sorting. References used in the text must be cited properly; any citation*

method is appropriate. The formatting for the testing procedure should be as follows:

- Maximum 5 Pages
- In point form
- Single Spaced, Size 12 Font
- 1 Inch Margins

Presentation Q&A Session

You must also submit a slideshow presentation summarizing the key aspects of the problem and your proposed solution.

	Time	Additional Information
Team Presentation	10 Minutes	Reminders will be given at 3 minutes, 1 minute, and 30 seconds. There is a grace period of 30 seconds, after which the presenters will be cut off. All team members will be required to speak.
Judges' Q&A session	5 Minutes	Judges will take this time to confer and mark the teams
Judges' Feedback	5 Minutes	Judges will give feedback on the presentation and ways to improve next time

Submission Method - In-Person

Item	File Format	Deadline	Email Subject Line
Testing Procedure	.pdf	6:00pm	Team ## - Junior Design Competition Testing Procedure Submission
Video	.MP4	8:00pm	Team ## - Junior Design Competition Testing Video Submission
Presentation Slides	.pptx	6:00pm	Team ## - Junior Design Competition Presentation Submission

Submission Method - Online

Item	File Format	Deadline	Email Subject Line
Testing Procedure	.pdf	6:00pm	Team ## - Junior Design Competition Testing Procedure Submission
Video (if your CAD model is a animated design instead of a static graph)	.MP4	8:00pm	Team ## - Junior Design Competition Testing Video Submission
CAD Model		6:00pm	Team ## - Junior Design Competition CAD Model

12.5.1 In-Person Prototyping Competition Marking Scheme

<u>PROTOTYPE</u>	Exceeds Expectation	Meets Expectation	Below Expectation	Little/No Value	Score
Creativity/ Uniqueness (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Scalability of Solution (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Operational Feasibility (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Accessibility (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Safety (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____

12.5.2 In-Person Competition Presentation Marking Scheme

<u>PRESENTATION</u>	Exceeds Expectation	Meets Expectation	Below Expectation	Little/No Value	Score
Clarity of expression (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Organization of ideas (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Showed evidence of mature judgment (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Effective participation of all team members (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Overall impression and responses to the judges' questions (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____

12.6.1 Online Competition Prototype Marking Scheme

<u>CAD MODEL</u>	Exceeds Expectation	Meets Expectation	Below Expectation	Little/No Value	Score
Completeness (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Creativity/Uniqueness (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Scalability of Solution (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Accessibility (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Operational Feasibility (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____
Safety (circle one)	10 - 9 - 8	7 - 6	5 - 4 - 3	2 - 1	_____

12.6.2 Online Competition Presentation Marking Scheme

<u>PRESENTATION</u>	Exceeds Expectation	Meets Expectation	Below Expectation	Little/No Value	Score
Clarity of expression (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Organization of ideas (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Showed evidence of mature judgment (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Effective participation of all team members (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____
Overall impression and responses to the judges' questions (circle one)	8 - 7	6 - 5	4 - 3	2 - 1	_____

13.1.0 Civil Engineering

This year UTEK is hosting the first ever Civil Engineering competition! The Civil Engineering competition gives students the opportunity to apply their knowledge and creativity towards solving infrastructure problems that exist worldwide.

13.2.0 Competition Schedule

Day 1: January 16, 2021

Teams will have a total of 8 hours from when the competition begins to complete all deliverables. You will be allocated a maximum of 7 hours to complete the report with the submission period starting after the 6th hour. Following the report submission, the presentation will be due at 6pm.

Time	Event
9:00 - 10:00 AM	Opening Ceremonies with Keynote Speaker
10:00 - 10:45 AM	Company Networking
10:45 - 11:00 AM	Competition Problem Statement Briefings
11:00 - 5:00 PM	Report & Design Work Time
5:00 - 6:00 PM	Report Submission Period Reports due at 6pm
5:00 - 7:00 PM	Presentation Work Time Presentations due at 7pm

Day 2: January 17, 2021

In the second day of the competition, teams will be presenting their submitted designs to a panel of judges and a small audience. Each presentation will have a 15 minute block to allow for set-up, presenting and panel questions.

Time	Event
9:30 - 10:00 AM	Judge Presentation Briefing
10:00 - 12:00 PM	Live Testing (Senior design only) & Presentations
12:00 - 1:00 PM	Lunch
1:00 PM - 3:00 PM	Presentations
3:00 - 4:00 PM	Awards & Closing Ceremony
4:00 - 5:00 PM	Judge Feedback & Networking

13.3.0 Rules

Team Composition

Teams will be between 2-5 members and will be open to all students of the University of Toronto.

Note: The Civil Engineering competition is not included in the OEC.

Resources & Research

Competitors will be provided with a list of resources that can be used to accompany their research and provide more background information to the problem statement. However, competitors are free to use any credible sources of their choice with the appropriate citations provided in the report as indicated in the deliverables.

13.4.0 Competition Deliverables

13.4.1 Design

Students are asked to create a retrofit design for the specified building plan. This design can be executed through the software of your choice. Design requirements are provided in the problem statement.

13.4.2 Report

Students are required to prepare a short report to accompany the design. This report will follow a standard engineering report format with a clear introduction, problem statement, design solution and the final conclusion/recommendation.

- Report should be between 600-800 words
- Must use a size 12 standard font of either Times New Roman, Arial or Helvetica, regular spacing
- All sources should be referenced in APA or IEEE formatting

13.4.3 Presentation & Delivery

The presentation is the final component of the UTEK competitions. This year's competition will be done remotely through a webinar platform. This will be your way of presenting your design to the panel of judges through a formal presentation format.

- Not all members of the team need to present their design, recommended to choose 2-3 students to allow for easy flow.
- Presentation should be around 7-8 minutes but must not exceed 10 minutes.

- Presentation slides can be created through platform of your choice
- Slides must be concise and easy to read
- Should not exceed 15 slides

In the case of any technical issues while or prior to presenting, accommodations will be made. Students may be asked to prepare a pre-recorded presentation video and be given extra time to do so.

13.5 Rubric

Assessment	Guidelines	Score
Report	Explanation of Design	
	Professionalism and Organization	
	Bonus (policy)	/5
	Total	/20 + (5)
Design	Affordability	
	Accessibility	
	Implementation	
	Total	/15

Presentation	Communication	
	Slides	
	Flow + Organization	
	Total	/15

14.1.0 UI/UX

In this competition, students in teams up to 4 people are asked to design a solution focused on improving a user experience with respect to a service interaction with a product. This competition focuses on front-end design and prototyping as opposed to back-end development. The team's ability to identify and address the user group's needs through any method are evaluated.

While teams are able to use any platform or method they wish to develop and present their design, we encourage the use of Figma because it allows for easy collaboration. Please check our website, utek.skule.ca, and the page *Workshops to see our past workshop on how to use Figma*.

14.2.0 Competition Schedule

- 11:00 - 6:00pm Problem Development & submit report by 6 PM
- 6:00 - 7:00pm -Submit your presentation
- 11pm -Teams advancing to the second round are announced

14.3.0 Competition Deliverables

Design Report

The design report should include the following elements and adhere to the restrictions:

- 3-10 pages
- Include model of the product/solution (i.e. prototypes or screenshots)
- Explanation of target user group
- Font size: 11 pt, Arial
- Standard margins
- References in APA, IEEE or MLA
- Explanation of product
- Justification of cost and feasibility
- Table of contents

Please see the rubric for more information.

Presentation

The presentation should include the following elements and adhere to the restrictions:

- 8 minutes for presentation
- Everyone must speak at least once
- Must include same information as report
- 2 minutes for questions
- Will be live through Quercus

Please see the rubric for more information.

14.4.0 Competition Rubric

Maximum 100 points	Did Not Meet Requirements	Satisfies Requirements	Goes Above Requirements	Excels
Feasibility of solution (maximum 15)	Solution feasibility not explained or not feasible (0)	Is feasible (7)	Is feasible and implementation plan was included (10)	Feasibility was thoroughly explained and expla-
Meets the needs of targeted users (maximum 10)	Does not meet the needs (0)	Identifies the needs of addressed users and	Improves the needs of specified users (7)	Solution is inclusive of all people, not just the speci-
Costs are well justified (maximum 10)	No attempt made to justify cost or costs are not men-	An attempt was made (4)	Costs are well justified and explained clearly (7)	Costs are well justified, convincing, and organized (10)
Product demonstration (maximum 10)	No product demonstration :(0)	A product demonstration exists (4)	The product demonstration improves the clarity	The product demonstration includes an example
Product innovation (maximum 15)	Innovation is not explained (0)	Product idea shows a semblance of creativity	Process of product innovation is detailed in the report	Product demonstrates excellent creativity and is
Presentation (maximum 20)	No presentation, or presentation is difficult to follow, or	Presentation includes all required information, and is	Presentation is well organized, with good oral	Presentation has excellent flow, clarity, and engag-
Report (maximum 15)	No report is submitted or it is missing sections, or it	Report contains all necessary information, however	Report is mostly free from spelling, grammar, and	Report has no spelling, grammar, or punctuation er-
Proper citations (maximum 5)	No citations (0)	Some citations (1)	Most citations (3)	All citations (5)

UTEK 2021 TEAM



VALERIE
Director

Valerie Ajayi
MECH 2T1+PEY
Director



GRACE
Vice-Director: Graphics

Grace Li
ECE2T3
Vice-Director Graphics



ARFA
Vice Director: WebMaster

Arfa Saif
ECE2T0
Vice-Director WebMaster



YI LI
Vice-Director: Marketing

Yi Li Ng
ECE 2T3
Vice-Director Marketing



BIPASHA
Vice-Director: Sponsorship

Bipasha Goyal
EngSci 2T1+PEY
Vice-Director Sponsorship



KEVIN
Vice-Director: Sponsorship

Kevin Zhu
EngSci 2T3
Vice-Director Sponsorship



IRTEZA
Vice-Director: Finance

Irteza Ahmed
CIV 2T2
Vice-Director Finance



KARTHIK
Vice-Director: LogOps

Karthik Diatha
INDY 2T2
Vice-Director LogOps



ULLA
Vice Director: LogOps

Ulla Hagomer
ECE 2T1 + PEY
Vice-Director LogOps

Competition Directors



DIANA

Consulting

Diana Li
ENGSCI 2T3
Consulting



ALYSON

Consulting

Alyson Wong
Mech (T1) 2T1 + PEY
Consulting



JULIANNE

Debate

Julianne Attai
EngSci 2T3
Debate



JHANAVI

Programming

Jhanavi Gera
ECE 2T3
Programming



YIFEI

Programming

YiFei Tang
ECE 2T1
Programming



AMANDA

Re-engineering

Amanda Tejada
CIV 2T1
Re-engineering



ASAD

Re-engineering

Asad Naqvi
Chem 2T3
Re-engineering



CHARLIE

Junior Design

Charlie Li
EngSci 2T3
Junior Design



KUMARAN

Civil Engineering

Kumaran
Civil Engineering



WENDY

Senior Design

Wendy (Yutong) Wang
EngSci 2T2
Senior Design



HARSIMRAT

Senior Design

Harsimrat Singh
ECE 2T2
Senior Design



SABRINA

Junior Design

Sabrina Sun
INDY 2T0 + PEY
Junior Design



The UTEK 2021 has been hard at work since the summer to put together the 20th University of Toronto Engineering Kompetitions! We hope that you enjoy the kompetition weekend, gain new skills, and meet new people!

6.0 CONTACT INFORMATION

During competition weekend, you can find each competition director on BB Collaborate in their own Live Stream session ready to answer your questions or provide you with help! Once added to the Quercus course, you can also post questions on the Discussions page.

Before the competition however, you can contact the UTEK Committee through the emails below.

Position	Email	First Name	Ask about!
Director	utek@skule.ca	Valerie	General UTEK questions or don't know who to ask
LogOps	logops@utek.skule.ca	Karthik	UTEK Schedule, Teams, Judges
		Ulla	
Marketing	marketing@utek.skule.ca	Yi Li	Pictures & Social Media
Web	webmaster@utek.skule.ca	Arfa	Website issues
Graphics & UI/UX Lead	graphics@utek.skule.ca	Grace	UI/UX Competition
Finance	finance@utek.skule.ca	Irteza	Refund &, Prizes
Sponsorship	sponsorships@utek.skule.ca	Bipasha	Sponsors
		Kevin	
Consulting Leads	consulting@utek.skule.ca	Diana	Consulting Competition
		Alyson	
Senior Design Leads	seniordesign@utek.skule.ca	Wendy (Yutong)	Senior Design Competition
		Harsimrat	
Junior Design Leads	juniordesign@utek.skule.ca	Sabrina	Junior Design Competition
		Charlie	
Debate Lead	debate@utek.skule.ca	Julianne	Debate Competition
Programming Leads	programming@utek.skule.ca	Jhanavi	Programming Competition
		YiFei	
Reengineering Leads	reengineering@utek.skule.ca	Amanda	Reengineering Competition
		Asad	
Innovative Design Lead	innovatedesign@utek.skule.ca	Sharmin	Innovative Design & Communications Competitions
Communication Lead	communications@utek.skule.ca		
Civil Lead	civil@utek.skule.ca	Kumaran	Civil Competition



University of Toronto Engineering Kompetitions
January 16th, 2021 - January 17th, 2021

making it easier to dream bigger