Internal
Engineering
Competition

Competition
Information
2021

Table of Contents

Introduction

The Ontario Tech Internal Engineering Competition (IEC) consists of eight sub-competitions and serves as the qualifying round preceding the Ontario Engineering Competition (OEC), and the Canadian Engineering Competition (CEC). The competitions are:

1. Consulting Engineering

2. Engineering Communications

3. Extemporaneous Debate

4. Innovative Design

5. Junior Team Design

6. Senior Team Design

7. Re-Engineering

8. Programming

Important Dates:
- IEC will be held on ***November 6th - 7th, 2021*** online
- OEC will be held on ***January 21st - 23rd, 2022*** *(learn more at www.oec2022.ca)*
- Canadian Engineering Competition (CEC) will be held on **March 11th - 13th 2022** in person at University of New Brunswick - Fredericton *(learn more at www.cfes.ca/cec/)*

1. Consulting Engineering

- The purpose of the Consulting Engineering competition is to challenge competitors to design a detailed solution to a large-scale engineering problem. Participants will be presented with a large-scale engineering problem on the day of competition to which they must devise a solution and draft a proposal. The proposal for the engineering problem will be created in a way that promotes a detailed solution to the client (in the form of judges).

- The Consulting Engineering team will be comprised of a *maximum of four competitors*. At least half of the design team must be from the undergraduate engineering program.

2. Junior Design

- This competition challenges junior (first and second year) engineering students to design and build a prototype to address a technical problem. The Junior Team Design category is similar to the Senior Team Design competition, but emphasis is placed on prototype functionality rather than design theory.

- The design teams must be comprised of a *maximum of four competitors*. At least half of the design team must be from the undergraduate engineering program.

- The team must be entirely comprised of students who have not completed all 2nd year courses.

3.   Engineering Communications

- The goal of this competition is to describe an engineering topic (i.e. process, product, device, issue) in terms that the general public can understand.

- Competitors have twenty (20) minutes to present the topic in detail, explained in terms that the public can understand. They must present the environmental, social, economic and political impacts, and whether these impacts are positive or negative. Competitors must give a critical discussion of the technology and associated issues.

- The Engineering Communications competition is prepared entirely outside of the realm of the Internal Engineering Competition. Competitors choose their own topic, prepare and research and develop a presentation and abstract of the topic.

- The Engineering Communications team will be comprised of a maximum of two competitors. At least half of the design team must be from the undergraduate engineering program.

4.   Innovative Design

- The Innovative Design competition is prepared entirely outside the realm of the Internal Engineering Competition. Competitors choose their own topic, prepare research and develop a design. The designs must be new and innovative and address a void in society.

- The Innovative Design team may be comprised of *one to four* competitors. At least half of the team must be from the undergraduate engineering program

- Prior to the competition, the team must submit a design summary. The purpose of this summary is for the judges and organizers to be prepared ahead of time with regard to the topics.

5. Extemporaneous Debate

- Extemporaneous Debate Competitors must use analytical techniques to present, with minimum preparation, a reasoned point of view of a resolution that has not been disclosed beforehand. The goal is to assess the competitors' abilities to convey ideas and develop arguments. The purpose is not to assess competitor knowledge of parliamentary procedure and formal debating rules. Therefore, the rules normally used in debates have been modified and relaxed to enable students with no formal debate experience to take part.

- The debate will be conducted in a shortened Canadian National Style debate format

- An Extemporaneous Debate Team will be comprised of a maximum of two competitors, of which only half must be representing an undergraduate engineering program

6. Senior Team Design

- The Senior Design Competition is designed to challenge competitors to solve a complex real-world problem. They must use their knowledge of advanced engineering techniques to work within time and budget constraints to design, build, and test a physical prototype of their solution.

- Teams will need to make use of their mechanical, electrical, and software abilities to come up with a solution to the challenge. Teams will be scored on the quality of their solution as well as their ability to market and present their solution to judges.

- The team must be entirely comprised of students who have completed *all 2nd year courses*

7. Programming

- The goal of the programming category is to encourage engineering students to produce a piece of industry-quality software with all of the proper user and administrative documents. The teams will use their software development skills, their technical writing abilities, and their project management skills to design a solution to a posed problem. This solution will then be presented to company executives (judging panel) for approval. The winning solution will not necessarily be the most technically correct but the one that has the most real-world applications and is most thoroughly thought out.
- The Programming team will be comprised of a maximum of four competitors. At least half of the design team must be from the undergraduate engineering program

8. Re-Engineering

- Re-engineering is the act of taking an existing engineering concept, product, technique, or technology and incrementally improving on its design to suit an alternate situation or application. In this competition, students will be required to apply the re-engineering process to an existing gadget or mechanism in order to add new functionality to it or enhance its original functionality. The intent of these improvements will be to extend the use of the device to an alternative situation or use case.
- The competitors will be required to write a report for each of the cases they complete as well as prepare one presentation to address both cases in front of the judges. Competitors can also opt to combine both solutions into one report of the combined length if they feel this format better conveys their solutions
- The Re-Engineering team will be comprised of a maximum of two competitors. The entire design team must be from the undergraduate engineering program.