SENECA ENGINEERING STUDENTS' SOCIETY

Seneca Engineering Competition 2024

Official Handbook

SENECA ENGINEERING STUDENTS' SOCIETY

Table of Contents

1. Introduction

The Seneca Engineering Competition (SEC) is an annual event designed to serve as a qualifier for the Ontario Engineering Competition (OEC) for engineering students. Additionally, it provides a hackathon-style learning experience for all students at Seneca College and Seneca alumni.

2. Qualifier Rules and Definitions

2.1 General Rules and Definitions

2.1.1 **“Qualifier”** refers to the preliminary competition held at member schools to determine which teams will advance to the Ontario Engineering Competition (OEC).

2.1.2 **“Engineering Student Societies’ Council of Ontario” (ESSCO)** refers to the provincial association of undergraduate engineering student societies in Ontario.

2.1.3 **“Ontario Engineering Competition” (OEC)** is the annual ESSCO event that includes various engineering competitions as outlined in this document.

2.1.4 **“Chair(s)”** refers to the person(s) responsible for coordinating the Qualifier.

2.1.5 **“Faculty of Applied Science and Engineering Technology”** (FASET) is the Engineering faculty at Seneca Polytechnic.

2.2 Eligibility

2.2.1 The Co-Chairs determine the eligibility of all competitors, teams, and projects according to the guidelines set out in this rulebook.

2.3 OEC Qualification

2.3.1 Only students enrolled in engineering degree programs at Seneca Polytechnic shall qualify for OEC.

2.3.2 Competitors not presently enrolled in classes, or on co-op are still eligible to qualify provided they are considered an enrolled/active student at Seneca or, the elapsed time has not exceeded one (1) year.

2.3.3 The students qualifying for OEC shall be in a team that meets the following criteria:

- 2.3.3.1 Have at least one student that satisfies 2.3.1 or 2.3.2
- 2.3.3.2 Score the highest points out of all teams satisfying 2.3.3.1

2.3.4 If only one team satisfies **2.3.3.1**, the qualification decision shall be at the discretion of the Chair(s) in consultation with at least two faculty members from FASET.

2.3.5. If the number of engineering students in the qualifying team is insufficient, the Chair(s) will work to complete the team by identifying students that satisfy **2.3.3** with the second and third highest scores until the team is adequately composed.

2.4 Team Composition

2.4.1 All students enrolled at any Canadian institution for an undergraduate program or a postgraduate diploma are eligible to compete.

2.4.2 The team must have at least one student:
- 2.4.2.1 Currently enrolled at Seneca **OR**
- 2.4.2.2 Satisfying **2.3.2**

2.5 Regulation Amendments

2.5.1 These regulations shall be considered the official regulations of SEC, an activity run by the Seneca's Engineering Students' Society (SESS) students. The regulations can only be amended with the approval of the entire SESS Executive Board.

2.6 Violation of Competition Rules

2.6.1. If a competitor is believed to have violated:

- A rule in this rulebook,
- A rule included in the problem statement given to competitors explaining their challenge, or
- A clarification to a rule provided by the Chair (s) during the question period

The following process will ensure that the issue comes to a result that is fair to all parties involved.

2.6.2. The Chair will determine if competitor(s) are in violation of the rules. If competitor(s) are found guilty of a violation during the design phase they will be notified immediately, although they are eligible to continue the competition and work on their Solution.

- Competitors will be provided in writing the alleged violation of the rules following the design phase.
- This communication of a rule violation shall be reported to the team by the Chair(s) (or an acting representative) to ensure the competitor(s) are immediately made aware of the situation.

2.6.3. If competitor(s) are found guilty of a violation following the conclusion of the design phase, and either before, after, or during the presentation and testing phases, competitors have one (1) hour to appeal the Chair(s) decision to the Judges. The appeal must be written and clearly explain why the competitors believe they followed the rules of the competition. Appeals shall be limited to one page with size 12 font single spaced. Competitors will be provided in writing the alleged violation of the rules following the design phase. This communication of a rule violation shall not be an email or text message to ensure the competitor(s) are immediately made aware of the situation.

2.6.4. If the competitor is not found to be in violation of any rules, then the competition will continue as normal. If the competitor is found to be in violation of any rules, then the competitor will be penalized. The severity of the penalty shall be established rather as outlined in the OEC rulebook or at the discretion of the Judges.

2.6.5 The decision of the judges is final, and not subject to any further appeals.

3. 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.

3.1 Team Composition

The Re-Engineering team will comprise a maximum of two (2) competitors.

3.2 Topic

It is recommended that the topic incorporate more than one engineering discipline. However, while the topic should challenge competitors' technical knowledge and skills, it should also require competitors to evaluate the economic, environmental, political and social implications of their proposed solutions and address the requirements of the customer. The winning solution will not necessarily be the most technically effective solution, but the solution that has the most real-world applicability and forethought. Therefore, the topic should be one that could exist in the real world. Topics drawn from reality must be fully documented. All necessary documentation must be provided to the competitors when the problem is presented.

3.3 Procedure

Pre-Competition Phase:

- **Theme Announcement**: Participants will receive the competition theme 7 days prior, along with the first case, team assignments and exact specifications of equipment available to teams during the competition.
- **First Case Distribution**: The first case will be provided at this time, allowing teams to prepare in advance.

Competition Day:

1. **Presentation of Problem**:
    - **Second Case**: The second case will be distributed on the day of the competition.

    - **Reading Period**: Teams will have up to 30 minutes to read through the cases. During this time, no work on solutions may begin.
    - **Q&A Session**: Following the reading period, a 15-minute question period will allow teams to seek clarification on the cases.
2. **Solution Development**:
    - **Time Allocation**: Teams will have between 4 to 8 hours to develop their solutions, including a 30 minute lunch break.
3. **Solution Presentations**:
    - **Presentation Format**: Teams will present solutions for both cases within a maximum of 15 minutes. Each team member is encouraged to contribute to the presentation.
    - **Q&A Opportunity**: A 5-minute question period will follow each presentation, allowing judges and other teams to ask clarifying questions.

Note: It is highly recommended that teams prioritize completing their solution for the first case before the competition to maximize their effectiveness during the event.

3.4 Allowed Resources

Competitors are allowed to bring the following equipment to the competition:

- Any background research conducted by team members prior to the event.
- Electronic materials stored on CDs, USB drives, disks, or other storage devices. Please verify with the organizers that the format of your electronic materials is compatible with the computers provided by OEC.
- Textbooks, course notes, and other reference materials.
- Each team member is permitted to bring one computer.

Important Notes:

1. While the use of the Internet and external resources is allowed during the competition, all information must be properly referenced. **Use of any kind of AI, AI extensions, etc. is strictly prohibited and will result in disqualification.**
2. Teams are prohibited from submitting work created by individuals outside their team. Any evidence of plagiarism will result in the disqualification of the entire team.
3. Volunteers will monitor each team during the design process to discourage cheating; however, competitors are expected to uphold the integrity and spirit of the competition.

3.5 Judges

A minimum of three (3) judges (and in any excess, an odd number of judges) are required to assess the problem-solving abilities, proposed solution, communication skills and team dynamics of the competitors. Judges in this category should come from a variety of backgrounds including communications, sales and technical or software engineering experience related to the topic.

3.6 Judging Criteria

The judging criteria will focus heavily on the feasibility and real-life applicability of the solution. While technical correctness is vital, it does not hold as much weightage.

		Case 1	Case 2
Solution	Functionality of Proposed Changes Environmental, Social and Economic Feasibility Technical Feasibility Real-world Applicability	**/40**	**/20**
Report	Clarity Writing Style and Professionalism Deliverable Compliance with Expectations	**/15**	
Presentation	Voice Articulation and Timing Visual Aids Response to Questions	**/25**	
Penalties	Plagiarism Insufficient Citation Documents Received After Deadline Absent Team Member Verbal Disclosure of School During Presentation Disclosure of School in Presentation Files/Documents Disclosure of School by Supporting Audience Members	-50 -50 -50 -50 -25 -10 -10	
Total		**/100**	

4. Programming

The goal of the programming category is to encourage engineering students to produce a piece of readable software. 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 application and is most thoroughly thought out.

3.1 Team Composition

The Programming team will comprise a maximum of four (4) competitors.

3.2 Topic

The topic will be a real-life problem found in any professional industry which can be solved through the application of programming. The type of industries can include, but are not limited to, finance, health, transportation, manufacturing and construction.

3.3 Procedure

Pre-Competition Phase:

- The main theme will be announced, and team names will be assigned to competitors 7 days prior. Specifications for available equipment will also be provided.

Competition Day:

1. **Problem Presentation**: Participants will receive detailed information on the problems, including expectations and requirements.
2. **Question Period**: A 15-minute period will be allocated for questions.
3. **Development Time**: Teams will have 6 to 8 hours to work on their solutions, including a 30 minute lunch break.
4. **Presentation Period**: Teams will present their solutions in a 10 minute time slot, followed by a maximum 5 minute question period with the judges.

3.4 Allowed Resources

Competitors are allowed to bring the following equipment to the competition:

- Any background research conducted by team members prior to the event.
- Electronic materials stored on CDs, USB drives, disks, or other storage devices. Please verify with the organizers that the format of your electronic materials is compatible with the computers provided by OEC.
- Textbooks, course notes, and other reference materials.
- Each team member is permitted to bring one computer.

Important Notes:

1. While the use of the Internet and external resources is allowed during the competition, all information must be properly referenced**.**
2. **You are allowed to use any AI extension in VS code.**
3. **Outside of VS Code, you are only allowed to use Microsoft Copilot. Use of any other AI will result in direct disqualification.**
4. Teams are prohibited from submitting work created by individuals outside their team. Any evidence of plagiarism will result in the disqualification of the entire team.
5. Volunteers will monitor each team during the design process to discourage cheating; however, competitors are expected to uphold the integrity and spirit of the competition.

3.5 Judges

A minimum of three (3) judges (and in any excess, an odd number of judges) are required to assess the problem-solving abilities, proposed solution, communication skills and team dynamics of the competitors. Judges in this category should come from a variety of backgrounds including communications, sales and technical or software engineering experience related to the topic.

3.6 Judging Criteria

The judging criteria will focus heavily on the feasibility and real-life applicability of the solution. While technical correctness is vital, it does not hold as much weightage.

Strategy/Algorithm	Simplicity Ingenuity Ability to Achieve Desired Outcome	**/40**
Code	Structure Readability Efficiency	**/30**
Resource Management	Memory Usage Efficiency Program's CPU Usage	**/10**
Presentation	Design Process Design Justification Design Critique Voice Articulation and Timing Visual Aids Response to Questions	**/20**
Penalties	Plagiarism Insufficient Citation Documents Received After Deadline Absent Team Member Verbal Disclosure of School During Presentation Disclosure of School in Presentation Files/Documents Disclosure of School by Supporting Audience Members	-50 -50 -50 -25 -10 -10 -10
Total		**/100**