

## 2<sup>nd</sup> Racecar Challenge – Competition Rules

### 1. RIGHT TO PARTICIPATE:

Any teams which meet the following conditions is eligible to participate in the 2<sup>nd</sup> Racecar Challenge competition:

- All its members have met 2<sup>nd</sup> Racecar Challenge’s eligibility criteria and have been duly registered for the 2<sup>nd</sup> Racecar Challenge program.
- All the team members have completed at least the first 3 Labs of the Beaver Works Summer Institute’s miniRACECAR course by April 23, 2023 at the latest.
- The team has submitted to Pierce its programs by April 23, 2023 at 17:00.

Note: A school can participate with more than one team in the competition. Each student can participate in only one group.

### 2. REGISTRATION:

Registrations require 2 steps: a first step, to be undertaken by the teachers or educators which will guide the team(s) throughout the course and the competition (individual students cannot register on their own), and a second step, for all students and educators to register on BWSI’s portal for miniRacecar as per the information we will provide them once the first step is completed.

The process can take up to a week to complete.

### 3. COST OF PARTICIPATION:

Participation in the competition is free of charge.

### 4. PARTICIPATION CANCELLATION:

A team wishing to cancel their participation can do so by sending a cancellation message at [racecar@acg.edu](mailto:racecar@acg.edu).

### 5. AWARDS AND CERTIFICATES:

First Winner:

The 2nd Racecar Challenge winning team and its accompanying teacher will be donated a physical racecar by the organizers and will have the opportunity to represent Greece at Beaver Works Summer Institute’s final racecar competition in August 2023 held on the campus of the Massachusetts Institute of Technology (MIT) in the USA . They will also qualify to attend the last week of BWSI’s summer program immediately preceding the final challenge, also on the MIT campus.

The winning team must be accompanied by one and one only teacher. Boarding and traveling expenses of the winning team and its accompanying teacher are not covered by the organizers or

BWSI. The organizers will endeavor to find sponsors to cover these expenses but may not be successful in doing so. If the winning team cannot travel to MIT's campus the first week of August, they will be able to attend the last week of BWSI's camp and to participate in BWSI's final challenge virtually.

It is important that the winning team uses the time between the Greek competition and its attendance to the last week of BWSI's camp to prepare itself. By then, it should have completed miniRacecar's all 5 labs and be comfortable with its material. In August 2023, the winning team will be facing a challenge which will be different from the one they faced in the Greek competition. They will learn the new challenge at the beginning of that week and will be working on preparing their code during that week.

Second & Third Winners:

The teams that will be distinguished in the second and third place will receive a certificate stating their ranking.

The other teams will receive a certificate of participation.

## **6. COMPETITION DESCRIPTION:**

The 2<sup>nd</sup> Racecar Challenge will take place at Pierce's on Saturday April 29, 2023 and online. The competition will be based on the codes the teams will have written as per the specifications of the miniRacecar course. It will not require a physical car although non-qualifying races will be organized in parallel among the teams which wish to test their program with the 4 cars the organizers will put at their disposal for that purpose.

On April 14, schools will declare the team(s) they wish to have participate in the 2<sup>nd</sup> Racecar Challenge. All members of the teams who wish to participate in the 2<sup>nd</sup> Racecar Challenge must have completed at least the first 3 Labs of Racecar Challenge by April 23<sup>rd</sup>, 2023, as confirmed by BWSI.

By April 23, 2023, all participating teams must have submitted their code to Pierce for 4 time trials and a final Mini Grand Prix track, which they will develop as an extension of the codes they have already developed through miniRacecar. The initial deadline for miniRacecar's completion and the codes' submission was April 26, 2023, but given the unexpected large number of participants, this date was changed to April 23, 2023 to provide sufficient time for the organizers to prepare.

On April 29, 2023, the day of the competition, the participating teams will compete first in 4 time trials. Teams will be ranked in function of their time at the 4 first time-trials. The first 8 teams will then proceed to the final Mini Grand Prix.

In the Mini Grand Prix, the 8 teams will compete in pairs, through the program they will have submitted, and the winning 4 teams will compete again in pairs. The winning 2 teams will then compete in the final round, the winner of which will represent Greece at BWSI's final competition.

### **Stage 1 Time Trials**

Each participating team, as per the programs it submitted, will be called to run on four tracks where they will be timed. The four tracks are:

1. Line Following: Cars must follow a line of a specific color from start to finish keeping constantly the line between the car wheels.
2. Lane Following: Cars must remain between two lines of a specific color from start to finish.
3. Wall Following: Cars must remain between two walls from start to finish.
4. Cone Slaloming: Cars must slalom between colored cones, blue and red, passing each color in a specific direction.

In each of the four trials the teams will receive points based on their ranking. The sum of the points collected by each team in the four categories will determine their overall ranking, from which the first eight teams will qualify to move on to the next phase. The scoring will be as follows:

<b>Rank</b>	<b>Points</b>
1 <sup>st</sup>	25
2 <sup>nd</sup>	18
3 <sup>rd</sup>	15
4 <sup>th</sup>	12
5 <sup>th</sup>	10
6 <sup>th</sup>	9
7 <sup>th</sup>	8
8 <sup>th</sup>	6
9 <sup>th</sup>	4
10 <sup>th</sup>	2
11 <sup>th</sup> - ...	1

In the event that in any of the time trials a car stops or leaves the track, its team is first ranked based on the time it achieved in the preceding trials, and for that time trial and the following ones, if any, it will be given the time of the slowest team among the teams which completed that time trial plus 20 seconds. For instance, if the worst time achieved by all teams for the Wall Following time trial is 70 seconds, then each team which will not finish that time trial will be assigned a 90 second time. In the event of a tie, the teams which do not complete a trial will be ranked in function of the fastest total time they have achieved until then.

### **Stage 2 Mini Grand Prix – Elimination Games**

Once the four time trials are completed, the eight teams with the most points will advance to the 2nd and final stage of the challenge. At this stage the teams will compete in elimination matches

with one another. The 4 winners of the four pairs will form two new pairs. The winners of these pairs will compete in the grand final where the grand winner of the competition will emerge. The losers will compete in the small final to advance to the third and fourth rank.



In all stages of the elimination races the winner will be the team that finishes or, in the event that both vehicles stop or go off the track, the one that has gone the furthest down the track. If in the first attempt both vehicles stop or go off the track, the attempt starts from the beginning with the vehicles changing positions at the starting point.

**These rules may be modified.**

## 7. KEY DATES

**September 19, 2022** Opening of registration for students and accompanying teacher or educators for BWSI's miniRACECAR, Python Core and the 2<sup>nd</sup> Racecar Challenge.

**November 4, 2022** Registrations close.

<b>April 14, 2023</b>	Declaration of participating teams to the organizers.
<b>April 23, 2023, 17:00</b>	Deadline for the completion of at least the 1 <sup>st</sup> 3 labs of the BWSI miniRACECAR course to qualify to participate in 2 <sup>nd</sup> Racecar Challenge and for the submission of teams' codes.
<b>April 29, 2023</b>	2 <sup>nd</sup> Racecar Challenge, virtually and at Pierce – The American College of Greece in Athens, Greece
<b>July 31, 2023</b>	Completion of at least the first 3 miniRacecar Labs for students who could not complete them sooner but chose to continue the course in order to receive a certificate of completion from BWSI.
<b>July 31, 2023</b>	Beginning of the attendance by the 2 <sup>nd</sup> Racecar Challenge's winning team of the last week of BWSI summer camp and final competition pre-trials.
<b>August 6, 2023</b>	Final BWSI Racecar Challenge 2023.