

Semester championship rules

Vehicle Mechanics Fundamentals

1. General

Semester simulation championship will be held as a mandatory precondition of signature and extra possibility for student to understand vehicle dynamics better and as a result may get some advantage in grade.

2. Documentation

Every single student will have his/her own race team, and get virtual \$100 M, to cover their spends. The simulation platform will be Optimum Lap – for more information please look at practical course material. This will answer questions like where to download software, how it works. Additionally, every team gets a base car (see at Moodle), that can be developed within the capacity of the budget. During the semester, teams (students) must create a documentation about their work and decisions. When they finish with the work, they have to submit the vehicle file (Project tree/Vehicle/ Right click on the vehicle, and export-> vehiclename.OLVeh – please use your Neptun ID as filename), parameters and the complete documentation about investigations they did. Important to add to the documentation conclusions, what was the result of more power, and less aero for example. Detailed guidance regarding the way of thinking is required, to let us be sure the final car parameters are not a result of guessing. The documentation must be submitted as a pdf file.

3. Developments costs

Teams' (Students') job is to find the compromise how to distribute their virtual money on different development directions – for an example please see chapter 6. It's important, although the steps and their costs are determined, their sign of the step is not regulated, so for example increasing and decreasing of the aero efficiency is allowed, cost of it is the same. Parameters that are not shown below, cannot be modified. One team submits one car, no changing of the parameters is allowed between different racetracks. Only the listed parameters can be changed during the development of the car, within the capacity of the budget.

Development cost table		Step		Cost
		step unit	dimension	\$ /step
Tire Data				
	Longitudinal Friction	0,005	-	10 M
	Lateral Friction	0,005	-	20 M
Aero Data				
	Aero Efficiency	0,01	-	5 M
Scaling factors				
	Power factor	0,1	%	1,18 M
General				
	Weight	0,5	kg	1,2 M

The available budget for the team is \$100 M.

4. Timeline

Deadline for the submission is 6th of May, 18:00. Result will be published soon. After submission deadline there is no possibility to participate in the championship. Furthermore, once after the team submitted its car, there is no possibility to change on it, even if the deadline is still not over.

5. Calendar and points

As it will be a virtual F1 season, below the calendar can be seen.

- | | |
|------------------------------------|---|
| I. Sepang International Circuit | VII. Silverstone Circuit |
| II. Shanghai International Circuit | VIII. Nürburgring |
| III. Circuit de Catalunya | IX. Hungaroring |
| IV. Circuit de Monaco | X. Circuit de Spa-Francorchamps |
| V. Circuit de Nevers Magny-Cours | XI. Red Bull Ring |
| VI. Circuit Gilles Villeneuve | XII. Suzuka International Racing Course |

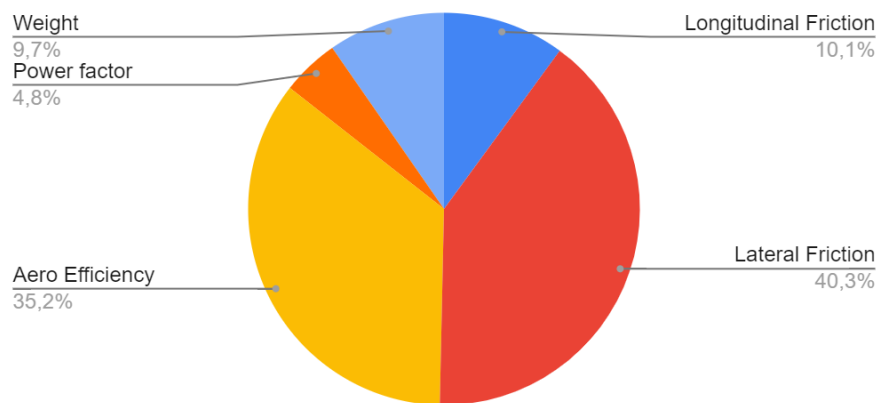
All circuits are available from the webpage, by the software. These are the tracks which on the submitted cars will be simulated, and according to their lap times, an order can be determined, fastest car will score most points. Scoring is going to happen according to this table:

1. 25 pts
2. 18 pts
3. 12 pts
4. 10 pts
5. 8 pts
6. 5 pts

In case of lap time equity on a race, the team(student) that submitted earlier its project during the semester will gain higher place – therefore it's advantageous to submit project as soon as possible. The same approach refers to the situation when two students submit the same car. In case of point equity on the championship, the team (student) scored more 1st places on races will get higher position, if number of 1st places are equal, then 2nd places will decide and so on.

6. Example

<i>Possible example of one car:</i>		Development					
		Base car	step unit	steps taken	developed car	\$ M /step	Total costs/row
Tire Data							
	Longitudinal Friction	2,1	0,005	1	2,105	10	10
	Lateral Friction	1,95	0,005	2	1,96	20	40
Aero Data							
	Aero Efficiency	2	0,01	7	2,07	5	35
Scaling factors							0
	Power factor	100	0,1	4	100,4	1,18	4,72
General							0
	Weight	743	-0,5	8	739	1,2	9,6
					Total development cost \$ M		99,32



7. Prizes

As a prize of Semester simulation championship students can get some advantage according to the following table by their results:

1. *Right to skip one mid-term exam with proven grade 5, that the student can choose*
2. *+40% to the result of freely choosen midterm exam*
3. *+30% to the result of freely choosen midterm exam*
4. *+20% to the result of freely choosen midterm exam, except it is lower than grade pass (2)*
5. *+15% to the result of freely choosen midterm exam, except it is lower than grade pass (2)*
6. *+10% to the result of freely choosen midterm exam, except it is lower than grade pass (2)*
7. *+5% to the result of freely choosen midterm exam, except it is lower than grade pass (2)*

In case of any further question, please do not hesitate to contact me on the email address gabor.sipos.uni@gmail.com.

Gabor Sipos