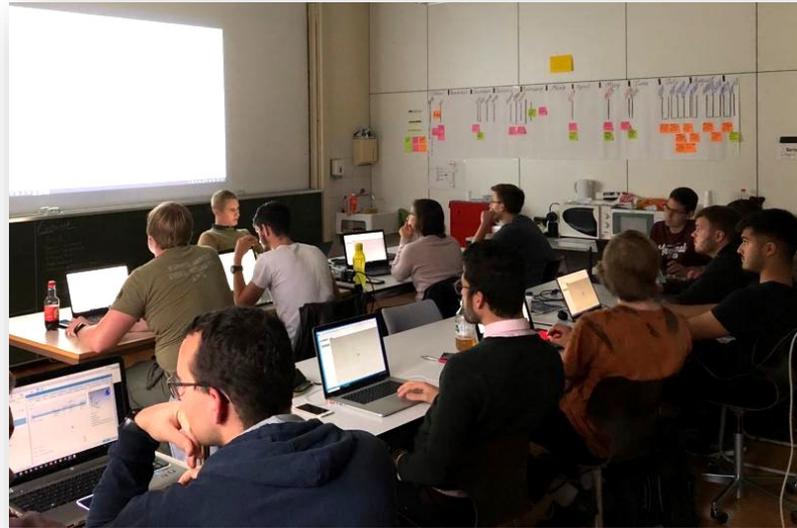




Five years have passed since two students of the University of applied Science founded the **Bern Formula Student**. Since its beginning the Bern Formula Students (**BFS**) projects gave the opportunity to over 100 students to develop their skills and knowledge, starting from implementation of technical theory up to team management. All participants benefited tremendously from their experience as a BFS member. The ability to develop skills ranging from manufacturing, management to critical thinking which will benefit them in their future career.



Season 2018-2019

We started our season around mid-September with the recruitment of new members for the upcoming season. After several successful seasons, the recruiting process is becoming overwhelming and it's thrilling to see the fruit of our hard labour finally paying off, by attracting so many new associates. Following this amazing outcome, we started the pre-concept and development details concerning the new ideas for our new model. Considering season goals, productivity, resource efficiency and advancement of each concept to define the final design. Therefore creating an appropriate timeline, is in every project the first step to success.



Season AROLA

The project development is a long and tenuous process, that allows us to meticulously plan our season. After the initial process was completed, we did an annual design presentation, on January 16th, where we revealed the final computer-aided design of **AROLA** to the public, friends, family and professors. We ended the meeting with a Q&A session which led to constructive conversation with our teachers and sponsors. Their precious feedback helped us to get ready for following phase. Which was the manufacturing **AROLA**.

On February 1st, the qualifications quiz for the upcoming events took place. Despite the fact we were in the middle of our exam weeks, we managed to prevail against strong competitors and qualified ourselves for the FS Netherland and FS Spain competitions.





21. Februar 2019, Baam The Innovation Show

Meanwhile we also participated in several exhibitions such as the Geneva International Auto Salon, Baam The Innovation Show, Formula E Village Bern, Future student day by BFH, Porsche Taycan Introduction at Porsche Zentrum Maienfeld. It is part of a never-ending process; we want to give the BFS and our sponsors as much exposure possible. We also take the time to show our previous project to show the evolution of our projects and the future concept of our FS SAE race cars.



12. March 2019, Geneva International Motor Show

The Highlight of the past seasons was most definitely us being able to take part at the press conference for Formula E race in Bern. We had the privilege to be side by side with Sébastien Buemi and his Formula E Race car. We enjoyed having him ask us questions regarding the technical details of our car. Moreover former F1 engineers from Spark Racing Technology, which build all Formula E cars, gave us valuable inputs for future developments.



12. September 2019, BFS as ambassador for electrical vehicle



16. May 2019, Press conference Formula E Bern

From left to right: Ms. Brida (Business), Mr. Morand (Sponsoring) Mr. Sebastian Buemi (Professional Race driver), Mr. Joss (CEO)



More than 50 carbon composite parts were manufactured. As final assignment project, an apprentice at HMF Formenbau produced the moulds for the body. The Berner Fachhochschule AHB produced the moulds for the wings and milled PET Foam cores, which reinforce the composite structures. It took the team 6 weeks to laminate all composite parts needed.

126 tubes had to be welded by our graduated locksmith. It took him 4 weeks beside the regular lecture to manufacture the chassis. But the result was excellent with in 5 mm tolerance



With the exception of inverter, main control unit and engine we designed, produce and programmed all electrical parts. To ensure reliable connection between the components we design a specific schematics for the cable harness. Phoenix Contact was our Sponsor who produced our required cable harness.

June 7th, we proudly introduced the **AROLA** to all our supporters and friends. A major intermediate target was reached, the race car was mechanically ready, but we wanted to perfectionate our electrical system. We intensively tested the electrical system to ensure the reliability of it. Electro-magnet interference and the wire harness were a challenge. However with numerous night shifts we did manage to finish on time for the first events. Due to our final exams session all members of the BFS had to study intensively, so we had to took the hard decision to cancel our first race in the Netherlands in favour of our studies. After all exams had passed, we used the opportunity to run a more tests on AROLA to ensure that everything was performing well and smoothly. Due to summer vacation most of our members had to manage their time appropriately between their summer jobs and the formula student project. Therefore we had only limited manpower available.



7. June 2019, Roll-out at the AHB in Biel

After several weeks it was time to load AROLA for the FS Spain event. Excited we made our way and were happy to finally present our work to the judges. Nine months of work lay behind us and we were exhausted from all our efforts. But all the work paid off. Even though the BFS is one of the smaller teams in the competition regarding the number of members and resource that we had, we could manage to put ourselves in the midfield. Especially our business plan presentation was our best contest, we successfully placed 21st out of 100. According to the judges, AROLA has a solid design with minor details which could be improved in the future. They were surprised our wireless battery management system, which is the first of its kind. They encouraged us to pursue the concept and improve it further.

We went back to Switzerland highly motivated by the precious feedback from the judges, the discussion with the other team and the gained contest experience.

We were already thinking and discussing how to implement all the inputs we received for the following season.



21. August 2019, Design Presentation where we had to justify our solution in front of the Formula Student Spain Jury



One of its kind! The first ever fully wireless battery management system in a formula student car.



Beside all the engineering skill we know how important team spirit is. Only as a team we can achieve our ambitious goals. For this matter we are looking out for each other.



11. August 2019 celebrate the end of the season with closing Event at Octane 126 Workshop.

August 11th, the last day of the season, Octane 126 were gracious to welcome us to their new workshop for our closing event. In between AROLA and the VLN Race cars we had a perfect ambience for great discussions between sponsors and guests.

Conclusion

Even if we gather a strong body of knowledge through the past 4 years it still a challenging project. Therefore it is a precious experience because all **BFS** associates had to go above their comfort zone to achieved their object. In hindsight the project was a full success, since the main goal had been achieved, namely to enhance the education of our Students. Everyone did benefit from their experience and improved knowledge in their future. Once more the **Bern Formula Student** fulfilled its slogan :

For students - by students



*Thank you for allowing our vision to come true. On behalf of all BFS members as well as all our Alumni we truly thank you for your generous support and the confidence you placed in us. Your support allowed us not only to fulfil our dreams but increases the highest asset of Switzerland - **education**.*

Season 2019-2020

Without any break we started with preparations for Season 2019/2020. After we analyzed the previous season, we set new goals for the following one. Our positive attitude enabled us to recruit 28 new members. As a result our team now counts 36 active Members from different departments as well as from first till fifth Semester. With our experience we were able to shorten the time needed until all new members were integrated into the team. Precise tasks and clear communication were key properties to this.

We just finished our most creative phase, all departments had worked on their different concepts. On the 11th November we had our concept freeze. Till we can show you our first developments we need to verify our ideas in order to be sure they are realizable and fulfil all requirements. There is a lot of work ahead of use but with our dedicated team, we are confident and looking forward to this years **BFS** adventure!

*In order to enable the same possibility for the members this season, we depend on **your precious support**.
By renewing our collaboration you allow 36 engineer Students to have a unique experience which complement our regular studies in order to be better engineers.*



New Season bringing 28 new members to the team. The **BFS** counts now 36 students from 5 different study courses.

Alain Morand, CEO:

Since its my second year as BFS member I know which challenges we will need to face. But with my experienced group we improved our organisation and could clearly reduce the time needed till new members where incorporated. Even though it will still be a challenge, I am looking forward to outperform all our goals thanks to our great team spirit.



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