Description of projects and teams

Project A: A product that facilitates breathing for high-altitude mountaineering (Prof. Kumar Varoon AGRAWAL)

One of the main endurance challenges for high-altitude mountaineering is the decrease in oxygen levels as we climb. As altitude increases, the atmospheric pressure drops, resulting in a decrease in the amount of available oxygen. Each breath delivers less oxygen, which becomes the main endurance challenge. This leads to altitude sickness and can lead to hypoxia in several cases. Design a product that will facilitate breathing at high altitudes.

Team A1	**Team A2**
Savine Blokker	BUFFET Lilou
Lara Praat	Ella Dengler
Julia Sonnenhol	Emma Brand
Ashley Hartley Haigh	Jorge Mario Nunez Gonzalez

Project B. Cooling vest for outdoor workers or athletes (Prof. Kevin SIVULA)

With today's rising temperatures, it is increasingly common for outdoor workers and athletes to experience heat-related illnesses. Sweating is, of course, the body's natural cooling mechanism, but this process becomes less effective under high-humidity conditions. While some portable solutions exist to cool down people exposed to high temperatures, these typically rely on forced convection and the evaporative cooling of water, which again are limited in high humidity conditions. A better product is needed. Develop a portable clothing item (like a vest) that could effectively cool an outdoor worker or athlete in high temperature and high humidity situations.

Team B1	**Team B2**
Emna Belgharbia	Nichelle Sequeira
Ludovica Fracassi	Clotilde Perrot
Inès Hamouni	Cassandra CHapi-Nitcheu
Oriane Azalbert	Michel Youssef

Project C. A product that solves the problem of quagga mussels in Lake Geneva (Prof. Kumar Varoon AGRAWAL)

Quagga mussels are an invasive species that have spread through many freshwater lakes. Lake Geneva (Lac Léman) has reported growing infestations in recent years. They attach to any hard surface: pipes, intake systems, hydropower plants, drinking water facilities. They affect cooling water systems of power plants or municipal water supply intakes. Design a product for this issue.

Team C1	**Team C2**
Clara VERON	Enzinger Méloé
Thomas Viking Christiansson	Klos Mikolaj Wojciech
Simon Sermet-Magdelain	Hong Seohyun
Diogo Santos Martins	

Project D. A product that reduces the waste of fruits and vegetables in supermarkets (Prof. Kumar Varoon AGRAWAL)

Food waste in supermarkets leads to enormous losses of water, energy, and land resources while contributing significantly to greenhouse gas emissions. Reducing this waste not only lowers costs for supermarkets but also makes healthy food more affordable for consumers.

Designing solutions to this problem supports both environmental sustainability and food cost. Design a product for this issue.

Team D1
Matthieu Lavallee
Christopher Ruan van der Walt
Quinn Wesener

Team D2
Jia En Pang
Wilson Noel Prajna Suharlim
Jessica Annabelle Hendrata

Team D3
Aktas Feriha Mesra
Visnja Jorovic
Karina Hernández
Dina Pechorina

Project E. A refrigeration system for a tropical village using natural hydrothermal steam (Prof. Jeremy LUTERBACHER)

A tropical village (peak temperatures up to 40°C) would like to build a refrigeration system for the village (2 cubic meters), and it has a large unused source of hydrothermal steam nearby (temperature 120°C). Can you design a system that runs on this steam?

Team E
Martinelli Alyssa
Emma Kappeler
Téo Georges
Chloé Eggli

Project F. Production of sparkling water at home using local resources (Dr. Marina MICARI)

Making sparkling water at home with local resources reduces plastic waste and transportation emissions, lowering environmental impact. It offers consumers a cheaper and more convenient alternative to bottled sparkling water. It also removes carbon dioxide locally, helping the environment.

Team F1
Ricardo Rainho
Julien Lippsmeier
Miguel Correia
Philippe Loewen

Team F2
Alina Canda
Juan Martinez
Léa Droux
Yusuf Kilicer

Project G. A product that reduces the CO_2 levels in poorly ventilated spaces (Prof. Wendy QUEEN)

Every night, millions of people sleep in rooms with dangerously high carbon dioxide levels—and most have no idea it's happening. When we sleep in enclosed bedrooms, our breathing gradually fills the space with CO2. In a typical closed bedroom, CO2 concentrations can rise from a normal outdoor level of around 400 parts per million (ppm) to 2,000–4,000 ppm or higher by morning. Some studies have recorded levels exceeding 5,000 ppm in poorly ventilated spaces.

Team G1
Adam Hoško
Hans Henrik Gjeruldsen
Arnau Casalprim
Ismael Maiga

Team G2
Léa Mourot
Aurélie Masson
Tee Jie Xi
Alanna Fion Kohany

Project H. Single-use inflatable bioreactor that maximizes O_2 transfer and CO_2 removal (Prof. Kumar Varoon AGRAWAL)

A single-use inflatable bioreactor improves cell growth by maximizing oxygen transfer and removing excess CO_2. It reduces contamination risks and eliminates costly cleaning, as one can dispose of the bioreactor after use. The system enables flexible biomanufacturing while assuring high-quality standards.

Team H1
Elie Khoury
Nadim Khalife
Hannah Hajj

Team H2
Pietro Bonaldi
Oscar Rosseneu
Ysée Laplanche
Guillaume Bedouelle