

Information sheet for FST5199B (AY 2021/2022)

FST5199B Integrated Food Research Lab is a laboratory-based module that will be offered in parallel with FST5199A MSc Research Project. In this module, students will be provided with opportunity to pick up hands-on skillsets on 6 advanced experiments happening routinely in FST research labs. The 6 experiments will be spread across 2 semesters and the students will work in pairs to complete each experiment. The students will then proceed to write a report based on the results obtained from the experiment. The report writing will train students to interpret and discuss the data collected. The module is designed in such a way where each teaching instructor will manage up to 6 to 8 students, and this small group teaching will provide quality learning experience to the students. Complementary with other graduate modules, FST5199B aims to equip students with well-rounded and advanced skillsets that will help improve students' employability and career growth.

The six experiments are:

1. Food safety and microbiology
 - Determining the minimum inhibitory concentration (MIC) of antimicrobial compound on pathogens.
 - Using selective agars to propagate the pathogens.
 - Preparing bacterial samples for Polymerase chain reaction (PCR).
2. Food chemistry
 - Extraction and concentration of bioactive compounds from plant material.
 - Purification of bioactive compounds using solid phase extraction column.
 - Determination of the antioxidant capacity of bioactive compounds via various antioxidant capacity measurement techniques.
 - Determination of identity of bioactive compounds via High Pressure Liquid Chromatography (HPLC).
3. Food fermentation
 - Determination of flavor compounds present in the food products via gas chromatography (GC).
 - Quantification of sugar concentration in the food products using High Pressure Liquid Chromatography (HPLC) coupled with evaporative light scattering detector (ELSD).
 - Learning of aseptic techniques to handle microorganisms.
4. Functional bakery food
 - Determination of the effect of vacuum mixing on the texture of bread using texture profile analysis.
 - Determination of bread volume using VolScan Profiler.
 - Understanding the techniques used in sensory evaluation.

5. Molecular biology techniques

- Learning the techniques to handle cell lines.
- Running of Western blot to identify biomarkers in the cells.
- Determination of anti-inflammation efficacy of bioactive active compounds on the cells.

6. Food rheology

- Extraction of gelatin from fish bones.
- Determination of rheology properties of the food product using rotational rheometer.
- Determination of the protein secondary structure using Fourier transform infrared (FTIR) Spectrometer.