Dalhousie University, Faculty of Agriculture

AGRI5710: Graduate Module Course

Module Title: Common Analytical Methods and Data Analysis in Food Material Science

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Dates module will be offered: May - June 2020.

Frequency of formal classes/meetings:
The module will comprise of 4 classes (2 hr each) and 3 lab work of 3 hrs (total of 17 contact hours). The classes will be held remotely via video conference, and the lab work will also be held as a video conference call using the software provided to the students.

Module Content and Learning Objectives:

Material science is an interdisciplinary field in the natural science and engineering domain where it involves studying the properties of matter and their applications into a wide array of science and engineering disciplines. The principle disciplines in material science include the microstructure of a material to its macromolecular physical and chemical properties where elements from applied physics and chemistry, as well as chemical, mechanical, civil, and electrical engineering is used to study the materials. Especially with the advancement of nanotechnology and nanoscience, the interest in material science propelled in the recent years (https://www.acs.org).
Even though no completely new material science principle has been used in the field of food science over a long period; however, the interest in food material science grew exponentially in recent years. The basis of all materials science, including food material science, involves relating the desired properties and relative performance of a material for a particular application to the structure-function of the material through material characterization.
Therefore, this module is intended for graduate students in the Faculty of Agriculture and others who are interested in learning about major material characterization methods used in food science including Differential scanning calorimetry (DSC), Fourier-transform infrared spectroscopy (FTIR), X-ray diffraction (XRD) and X-ray photoelectron spectroscopy (XPS). The module will include discussions on the theoretical background of each analytical method, followed by data analysis and interpretation. Students will be encouraged to take part in discussions actively. There will also be training (lab work) on the data analysis and interpretation using appropriate data analysis software.

Learning Outcomes:

1. Learn the principles and theories behind the common material characterization methods such as DSC, FTIR, XRD, and XPS
2. Evaluate and train on the data analysis methods and data interpretation of material characterization methods using related data analysis software.

Method of Evaluation:

Students will be evaluated using a data analysis lab exercise (55%), and final evaluation (35%), and participation/contribution to discussions (10%).

Any restrictions on enrollment: N/A