

FOOD SCIENCE & TECHNOLOGY 7611

Research Methods

Fall, 2016

Instructor: Yael Vodovotz

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Office Hours: After class and by appointment.

TA: TBD

References:

Provided in course handouts

Course Objectives:

Students completing this course should be able to:

- Understand the principles behind various instrumental analysis techniques used in food science.
- Understand when a technique is applicable and what the shortcomings of the instruments are.
- Interpret the results obtained from the technique(s)

Lecture Outline:

1. Sample preparation
2. Spectroscopy
 - a. Principles and Theory
 - b. Mass Spectroscopy
 - c. Nuclear Magnetic Resonance
 - d. Electron Spin Resonance
3. Thermal Analysis
 - a. Theory and application
 - b. Methods
 - i. Calorimetry
 - ii. Gravimetric

iii. Mechanical

4. Electrophoresis
 - a. Principles
 - b. Components
 - c. Types of analysis
5. Rheology
 - a. Theory
 - b. Instrumentation
 - i. Viscosity
 - ii. Texture
6. Microscopy
 - a. Application
 - b. Types
 - i. Light
 - ii. Electron

Laboratory Outline:

1. Introduction
2. Mass Spec.
3. Liquid NMR
4. Rheology/Texture Analysis
5. Thermal Analysis (DSC and DMA)
6. Electrophoresis
7. Microscopy (Confocal and TEM)

Grading Criteria:

There will be 2 exams prior to the final exam. These will be structured around problem solving: using the information obtained in class/lab to choose an appropriate technique of analysis for the information requested.

Exam 1:	100 points
Exam 2:	100 points
Exam 3:	150 points
Laboratory:	120 points (20*6 labs)
Lab. leader	30 points
Total	500 points

Attendance Policy:

This is a laboratory course in which actual instruction and demonstration occurs only during class time. Each student has a maximum of 1 potentially "excused" absence. Whether an absence is "excused" or not, is determined by instructors. Acceptable "excuses" are only

applied to unavoidable circumstances (i.e., illness, car accident, etc.) and documentation is required (i.e., doctor's note). Absence will not be excused for extracurricular activities, weddings, vacations, etc. Each unexcused absence will result in a reduction of the student's final grade by 2%.

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

Disability Services:

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.