



SYLLABUS: FDSCTE 5600

FOOD ANALYSIS

SPRING 2020 (3 CREDITS)

Course overview

Instructor

Instructor: Luis E. Rodriguez-Saona
Department: Food Science and Technology Department
Email address: rodriguez-saona.1@osu.edu
Phone number: 614-292-3339 (office)
Office Location: Parker FST Building Rm 325
Office hours: "Open-door" policy or hours by appointment

Course Organization

Meeting Times and credits: WF 10:20 – 11:15 am, 3 credits
Laboratory times: Tu: 9:10 am – 11:10 pm; Th: 8:00 am – 10:00 pm (Rm 124)
Prerequisites/co-requisites/exclusions: FDSCTE 5600 or permission of instructor, or Grad standing.
Teaching Assistants: Jessica Miao (miao.33@buckeyemail.osu.edu), Shengyue Shan (shan.131@buckeyemail.osu.edu), Yao Siyu (yao.806@buckeyemail.osu.edu), and Kuanrong Zhu (zhu.1421@buckeyemail.osu.edu)

Course description

This course covers the basic analytical tools for determination of moisture, proteins, carbohydrates, lipids, minerals and vitamins in food systems. We will cover principles and applications of instrumental methods for qualitative and quantitative analysis used in the physical, chemical and instrumental examination of food products. Students will perform experiments to determine major food components using chemical and instrumental methods with a special emphasis placed on the evaluation of methods and interpretation of results.

Course materials

Required Textbook

- None

Recommended reference materials

- Food Analysis: Fifth Edition, S. Suzanne Nielsen. (2017)
(<https://www.springer.com/gp/book/9783319457741>)

- Fennema's Food Chemistry, Fifth Edition; Srinivasan Damodaran, Kirk L. Parkin and Owen R. Fennema (Editors). (2017). (<https://www.crcpress.com/Fennemas-Food-Chemistry/Damodaran-Parkin/p/book/9781482208122>)
- Official Methods of Analysis of AOAC International, 21st Edition, 3-volume print edition. George W. Latimer, ed. (2019). (<https://www.aoac.org/official-methods-of-analysis-21st-edition-2019/>)
- Food Analysis: Theory and Practice. Pomeranz and Meloan, 3rd. ed., (2000). (<https://www.springer.com/gp/book/9780834218260>)

Internet resources

- Carmen - <https://carmen.osu.edu/> (**Check daily**; all materials will be uploaded here)

Supplemental materials

- Additional readings are drawn from a variety of sources and will be posted on the Carmen course site.

Course technology

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Required software

- **Microsoft Office 365:** All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found [at go.osu.edu/office365help](http://go.osu.edu/office365help).

Carmen access

You will need to use [BuckeyePass](#) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](#) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click "Enter a Passcode" and then click the "Text me new codes" button that appears. This will text you ten passcodes good for 365 days that can each be used once.

- Download the [Duo Mobile application](#) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

Course objectives and learning goals

Upon completion of the course, students will be able to:

Objective 1: Identify the principles, purposes, applications, and limitations of techniques for the chemical and instrumental analysis of foods.

- **Learning goal:** Develop knowledge of core concepts in food analysis

Objective 2: Identify appropriate methods for the analyte and/or food system of interest and interpret analytical data including use of common calculations, and resources relevant to food analysis.

- **Learning Goals:** Use critical thinking, inquiry and scientific approach to solve analytical problems facing the food industry.

Objective 3: Provide hands-on laboratory experience

- **Learning goals:** Evoke students' interest, motivation and problem-solving skills, and demonstrate written communication skills for sharing scientific ideas

By integrating class lectures, discussion activities, readings, assignments and class activities, students will achieve the full learning experience.

Evaluation Criteria

| Category | % |
|--------------------------|-------------|
| Midterm Exams (2) | 30% |
| Laboratory reports | 50% |
| Comprehensive Final Exam | 15% |
| Participation | 5% |
| Total | 100% |

Grading scale

| Grade | % |
|-------|--------------|
| A | 93 and above |
| A- | 90 – 92.9 |
| B+ | 87 – 89.9 |
| B | 83 – 86.9 |

| | |
|----|-----------|
| B- | 80 – 82.9 |
| C+ | 77 – 79.9 |
| C | 73 – 76.9 |
| C- | 70 – 72.9 |
| D+ | 67 – 69.9 |
| D | 60 – 66.9 |
| E | Below 60 |

Course schedule (tentative)

Lecture Outline

| Module | Topic |
|--|---|
| Module 1 Intro to Food Analysis | Intro to the course, Modern Food Analysis |
| | Evaluation of Analytical Data & Sample Preparation |
| Module 2 IUV & Visible Spectroscopy | Basic Principles of Spectroscopy |
| | Ultraviolet and Visible Spectroscopy |
| Module 3 Chemical Characterization & Compositional Analysis | pH and Titratable Acidity |
| | Carbohydrate Analysis: Simple Sugars, Starch, Fiber |
| | Moisture & Total Solids |
| | Fat Analysis |
| | Protein Analysis |
| Module 4 IR Spectroscopy & Chromatography | Infrared Spectroscopy |
| | Principles of Chromatography |
| | Applications in Food Analysis |

Laboratory Outline

| Date | Labs |
|------------------|--|
| Week of Jan 13 | Titrate acidity of Juices |
| Week of Jan 20 | Simple Sugars of Juices |
| Week of Jan 27 | Review & Discussion for Lab |
| Week of Feb 3 | Moisture Content |
| Week of Feb 10 | Starch Analysis |
| Week of Feb 17 | Lipid Analysis – Soxhlet & Bligh/Dyer |
| Week of Feb 24 | Protein Analysis – Combustion & colorimetric methods |
| Week of Mar 2 | Review & Discussion for Lab |
| Week of Mar 9 | Spring Break |
| Week of Mar 16 | Chromatography – GC & HPLC |
| Week of Mar 23 | Review & Discussion for Lab |
| Week of March 30 | NIR & Mid-IR Spectroscopy |
| Week of Apr 6 | Review & Discussion for Lab |
| | |

COURSE POLICIES

Attendance

Attendance is encouraged and will be tracked electronically in Canvas through roll calls at the beginning of each class period throughout the semester. Everyone's expected to participate if you wish to succeed in the course. Make sure you are logging into the course in Carmen. If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.

Make-up Work

If you miss an examination for a documented medical attention for an illness, a death in the family, participation in a documented University sanctioned event, or any other valid excuse, you need to make coordinate with the instructor. Excuses for missing an exam must be presented to the instructors prior to the exam when at all possible. Students who will be participating in University sanctioned events must provide the instructor with a copy of the scheduled events and the classes that will be missed. This documentation must be signed by the coach/supervisor and given to the instructor two weeks prior to the event.

Communication

Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

- **Grading and feedback:** For Laboratory reports and exams, you can generally expect feedback within **14 days**.
- **Email:** I will reply to emails within **24 hours on days when class is in session at the university**. This is the best way to reach me.

Discussion and Communication Guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** You should write using good grammar, spelling, and punctuation.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably.
- **Backing up your work:** Compose your academic material in a word processor, where you can save your work. Save your final version as pdf and place it into the Carmen drop box for assignment submission.

Late Assignments

To receive full credit, work must be turned-in on time and in condition to be evaluated. Late assignments will incur a deduction of 10% of the total point value for each 24-hour period that they are late (including weekends). Late assignments can be turned in for up to 7 days (including weekends) after they are due with the penalty described above. After that students will receive a 0 for the assignment. Excuses for missed or late assignments – even valid ones – will not be accepted more than 7 days after the assignment due date.

University Policies

Academic Integrity/ Misconduct

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines

established in the University's Code of Student Conduct and this syllabus may constitute Academic Misconduct.

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: Any activity that tends to compromise the academic integrity of the University, or subvert the educational process. Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Copyright Disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also available through the 24/7 National Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org

Diversity

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Accessibility accommodations for students with disabilities

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Student Life Disability Services at [614-292-3307](tel:614-292-3307) or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to <http://ods.osu.edu> for more information.