

FOOD ANALYSIS Syllabus

FDSCTE 5610 Spring 2021

Course Information

- **Course times and location:** Lectures WF 10:20 – 11:15 am (Parker Food Sci Bldg 118). The first 2 weeks will be **online asynchronous** except for the first introduction lecture (W 1/13) that will be given **synchronous**. Afterwards, lectures will be delivered in-person and synchronous, and all lectures will be recorded and posted in Carmen. Students are encouraged to attend live sessions either by participating in-person or synchronous by zoom. Laboratories Tu: 9:10 am – 11:10 pm OR Th: 8:00 am – 10:00 pm (Rm 124 & 136) will be in person.
- **Credit hours:** 3
- **Mode of delivery:** Hybrid.

Instructor

- **Name:** Luis E. Rodriguez-Saona
- **Email:** rodriguez-saona.1@osu.edu
- **Phone Number:** 614-292-3339
- **Office location:** Parker Building Rm 325, Department of Food Science and Technology
- **Office hours:** “Open-door” policy or hours by appointment. A message to my OSU email address is the preferred method of communication; students should indicate the course number in the Subject line to make sure I see the message. Email to schedule an appointment. My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to be sure you receive these messages.

Teaching Assistant

- **Name & Email:** Siyu Yao (yao.806@buckeyemail.osu.edu), Kuanrong Zhu (zhu.1421@buckeyemail.osu.edu), Xiaoyan Tan (tan.1059@buckeyemail.osu.edu), and Dila Donmez (donmez.5@buckeyemail.osu.edu).

Course Prerequisites

Senior standing OR Graduate standing OR permission of instructor.



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 Objectives and Learning Outcomes

By the end of this course, students should successfully 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.

How This Course Works

Mode of delivery: This course is hybrid. We require that you attend either in-person or synchronous all lecture sessions each week. The remainder of your work will take place in Carmen throughout the week. All lectures will be recorded and posted in Carmen. All Lab sessions are mandatory and will be delivered in person.

Pace of online activities: This course is divided into **weekly modules** that are released one week ahead of time. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame.

Credit hours and work expectations: This is a 3 credit-hour course. According to [Ohio State bylaws on instruction](https://www.ohio-state.edu/credithours) (go.osu.edu/credithours), students should expect around [3] hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to [6] hours of homework (reading, studying, reviewing and editing notes, discussing with fellow students and assignment preparation, for example) to receive a grade of [C] average.

Attendance and participation requirements: Research show that regular participation is one of the highest predictors of success. With that in mind, I have the following expectations for everyone's participation:

- **Attendance policy:** Students are expected to attend class in-person OR synchronously during the designated meeting time, unless we have discussed otherwise. However, I understand that things happen outside of your control and I will record classes. If a conflict should arise, please let me know ahead of class if possible, and as close to your absence as possible such we can coordinate.
- **Participating in online activities for attendance: at least once per week**
You are expected to log in to the course in Carmen every week. During most weeks you will probably log in many times. If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.
- **In-person OR synchronous zoom meetings (MANDATORY) and office hours (OPTIONAL)**
All in-person scheduled classes for the course and my office hours are optional. I will post recordings of sessions for those who cannot attend.

Course Materials, Fees and Technologies

Required Materials and/or Technologies

- None

Recommended/Optional Materials and/or Technologies

- 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.

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection.
- **Webcam:** built-in or external webcam, fully installed and tested
- **Microphone:** built-in laptop or tablet mic or external microphone
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for [technology and internet access](https://go.osu.edu/student-tech-access) (go.osu.edu/student-tech-access).

Required Software

Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Visit the [installing Office 365](https://go.osu.edu/office365help) (go.osu.edu/office365help) help article for full instructions.

CarmenCanvas Access

You will need to use [BuckeyePass](https://buckeyepass.osu.edu/) (buckeyepass.osu.edu) 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 do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](https://go.osu.edu/add-device) (go.osu.edu/add-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.
- [Install the Duo Mobile application](https://go.osu.edu/install-duo) (go.osu.edu/install-duo) on 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 \(HELP\)](tel:614-688-4357) and IT support staff will work out a solution with you.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- [Navigating CarmenCanvas](https://go.osu.edu/canvasstudent) (go.osu.edu/canvasstudent)
- [CarmenZoom virtual meetings](https://go.osu.edu/zoom-meetings) (go.osu.edu/zoom-meetings)
- [Recording a slide presentation with audio narration and recording, editing and uploading video](https://go.osu.edu/video-assignment-guide) (go.osu.edu/video-assignment-guide)

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Self Service and Chat:** go.osu.edu/it
- **Phone:** [614-688-4357 \(HELP\)](tel:614-688-4357)
- **Email:** servicedesk@osu.edu

Grading and Faculty Response

How Your Grade is Calculated

Assignment Category	Points
Exams (2)	30
Laboratory reports	50
Comprehensive Final Exam	15
Participation	5
Total	100

See [Course Schedule](#) for due dates.

Descriptions of Major Course Assignments

Exams- Announced exams will be given twice throughout the semester to test your knowledge on topics covered. Midterms will be Online, and students will submit on Carmen.

Final Exam: The final exam is comprehensive and will assess students' learning of topics throughout the semester. Final exam will be Online, and students will submit on Carmen.

Laboratory Reports: Laboratory reports should start with a cover page that has the title of the project, the student's names, email addresses, and department. In 250 words or less, provide an abstract describing your Lab. On the second page and thereafter, the project description should contain following components: 1) introduction that clearly introduces the topic of the project. Outline the goals and objectives of the project; 2) methods that describe the approach and study design. The methods should be described in detail or with sufficient references; (3) The findings and arguments of the work should be described and illustrated. Supporting figures, tables and images of the results should be included; (4) the significance of your study should be presented including the major conclusions inferred from the results, implications of the work, and recommendations; (5) references. The Lab report should be no longer than 6 pages, not including references. Students can select their own groups (2 or 3 students) or will be assigned by the instructor. Assessment rubric and additional details will be provided in the Carmen site for the course. Lab reports are to be submitted on Carmen.

Participation: This course requires engagement from the students with the topics at hand. Each student will be individually assessed on how they engage throughout the semester in discussion by providing their opinions, bringing in contextually appropriate comments and examples, and supporting the learning environment by asking questions of their peers and guest speakers.

Academic integrity and collaboration: Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow [MLA/APA/Chicago etc.] style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in but no one else should revise or rewrite your work.

Late Assignments

Please refer to Carmen for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments.

To receive full credit, work must be turned-in on time and in condition to be evaluated. I expect you to turn in assignments on time. However, I am also reasonable, and want to see you master the material in this class. **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. If there are extenuating circumstances that prevent you from turning in an assignment on time, please connect with me as soon as possible after such a situation arises for further discussion.

Instructor 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 [614-688-4357 \(HELP\)](tel:614-688-4357) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **24 hours on days when class is in session at the university**.
- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check [your notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Discussion board:** I will check and reply to messages in the discussion boards once mid-week and once at the end of the week.
- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **seven days**. Assignments submitted after the due date may have reduced feedback and grades may take longer to be posted.

Grading Scale

93–100: A
 90–92.9: A-
 87–89.9: B+
 83–86.9: B
 80–82.9: B-
 77–79.9: C+
 73–76.9: C
 70–72.9: C-
 67–69.9: D+
 60–66.9: D
 Below 60: E

Other Course Policies

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:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. I will provide specific guidance for discussions on controversial or personal topics.



- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.
- **Synchronous sessions:** During our Zoom sessions I ask you to use your real name and a clear photo of your face in your Carmen profile. During our full-group lecture time, you may turn your camera off if you choose. When in breakout rooms or other small-group discussions, having cameras and mics on as often as possible will help you get the most out of activities. You are always welcome to use the [free, Ohio State themed virtual backgrounds](http://www.osu.edu/downloads/zoom-backgrounds.html) (www.osu.edu/downloads/zoom-backgrounds.html). Remember that Zoom and the Zoom chat are our classroom space where respectful interactions are expected.

Academic Integrity Policy

See [Descriptions of Major Course Assignments](#) for specific guidelines about collaboration and academic integrity in the context of this online class.

Ohio State's Academic Integrity Policy

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](http://studentconduct.osu.edu) (studentconduct.osu.edu), 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.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- [Committee on Academic Misconduct](http://go.osu.edu/coam) (go.osu.edu/coam)
- [Ten Suggestions for Preserving Academic Integrity](http://go.osu.edu/ten-suggestions) (go.osu.edu/ten-suggestions)
- [Eight Cardinal Rules of Academic Integrity](http://go.osu.edu/cardinal-rules) (go.osu.edu/cardinal-rules)

Copyright for Instructional Materials

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.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member."

This course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environmental Sciences. These principles are located on the Carmen site for this course; and can also be found at <https://go.osu.edu/principlesofcommunity>. For additional information on Diversity, Equity, and Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (<https://equityandinclusion.cfaes.ohio-state.edu/>). If you have been a victim of or a witness to a bias incident, you can report it online and anonymously (if you choose) at <https://studentlife.osu.edu/bias/report-a-bias-incident.aspx>.

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. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, [on-demand mental health resources](https://go.osu.edu/ccsondemand) (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at [614- 292-5766](tel:614-292-5766). **24-hour emergency help** is available through the [National Suicide Prevention Lifeline website](https://suicidepreventionlifeline.org) (suicidepreventionlifeline.org) or by calling [1-800-273-8255\(TALK\)](tel:1-800-273-8255). [The Ohio State Wellness app](https://go.osu.edu/wellnessapp) (go.osu.edu/wellnessapp) is also a great resource.

Accessibility Accommodations for Students with Disabilities

Requesting Accommodations

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 \(SLDS\)](#). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. In light of the current pandemic, students seeking to request

COVID-related accommodations may do so through the university's [request process](#), managed by Student Life Disability Services.

Disability Services Contact Information

- Phone: [614-292-3307](tel:614-292-3307)
- Website: slds.osu.edu
- Email: slds@osu.edu
- In person: [Baker Hall 098, 113 W. 12th Avenue](#)

Accessibility of Course Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- [CarmenCanvas accessibility](http://go.osu.edu/canvas-accessibility) (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- [CarmenZoom accessibility](http://go.osu.edu/zoom-accessibility) (go.osu.edu/zoom-accessibility)

Course Schedule

Refer to the CarmenCanvas course for up-to-date due dates.

Week	Module	Topic
Week 1	Module 1 Intro to Food Analysis	Intro to the course, Modern Food Analysis
Week 2		Evaluation of Analytical Data & Sample Preparation
Week 3	Module 2 UV & Visible Spectroscopy	Basic Principles of Spectroscopy
Week 4		Ultraviolet and Visible Spectroscopy
Week 5		First Examination
Week 6	Module 3 Chemical & Compositional Analysis	pH and Titratable Acidity
Week 7		Carbohydrate Analysis: Simple Sugars, Starch, Fiber
Week 8		Moisture & Total Solids
Week 9		Fat Analysis
Week 10		Protein Analysis
Week 11 & 12	Module 4 IR Spectroscopy & Chromatography	Infrared Spectroscopy
Week 13		Principles of Chromatography
		Applications in Food Analysis



Laboratory Outline

Date	Labs
Week 2 (Jan T19 and Th21)	Titratable acidity of Juices
Week 3 (Jan T26 and Th28)	Simple Sugars of Juices
Week 4 (Feb T2 and Th4)	Review & Discussion for Lab
Week 5 (Feb T9 and Th11)	Moisture Content
Week 6 (Feb T16 and Th18)	Starch Analysis
Week 7 T23 and W24 are Break Days	No Lab
Week 8 (Mar T2 and Th4)	Lipid Analysis – Soxhlet & Bligh/Dyer
Week 9 (Mar T9 and Th11)	Protein Analysis – Combustion & colorimetric methods
Week 10 (Mar T16 and Th18)	Review & Discussion for Lab
Week 11 (Mar T23 and Th25)	Chromatography – GC & HPLC
Week 12 (Mar T30) W31 and Th1 are Break Days	No Lab
Week 13 (Apr T6 and Th8)	NIR & Mid-IR Spectroscopy
Week 14 (Apr T13 and Th15)	Review & Discussion for Lab
Week 15 (Apr T20 and Th22)	Review

