

**RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY
SCHOOL OF ENVIRONMENTAL and BIOLOGICAL SCIENCES**

Department of Food Science

COURSE TITLE	Food Analysis
COURSE NUMBER	11:400:304
CREDITS	4
SEMESTER(S) OFFERED	Spring
CLASS DETAILS	
Days/ Time(s) Location	Tu/Fri 9:15 - 10:35 am at FS 109 Lab: Tu or W 10:55 am - 1:55 pm FS303
PREREQUISITE(S)	Principles of Food Science (11:400:201) & Pre-or co-req (for Research option only): Organic Chemistry (01:160:308)
INSTRUCTOR INFORMATION	
Name	Dr. Qinrong Huang
Phone	848-932-5514
Email	qhuang@sebs.rutgers.edu
Office Hours [Day(s) & Time(s)]	2:00 – 4:00 pm Wednesday
Office Address	Food Science Building Room #221 65 Dudley Road, New Brunswick NJ 08901
COURSE DESCRIPTION	
<p>This course is designed to provide our students a clear understanding of the principles behind various instruments that are commonly used in food industry and academic research labs to:</p> <ul style="list-style-type: none"> • characterize the structure and physical properties of food components, as well as laboratory experience on different instruments, which include pH meter, UV, fluorescence, FTIR, TLC, viscometer, HPLC, GPC, GC, and GC-MS. • Learn modern methods of analytical chemistry, with emphasis on chromatography. 	

- Apply analytical methodology to lipids, amino acids, carbohydrates, and other food components.
- Learn the importance of precision, accuracy, and significance of results.

COURSE OBJECTIVES

After completing this course, our students are expected to:

- (1) Understand weight to ppm/molar conversion, solution preparation and dilution, as well as statistical analysis of the data;
- (2) Understand the pH of food, buffer, buffer capacity, pH titration;
- (3) Understand the principles and instrumentation of UV, fluorescence, and FTIR;
- (4) Understand the physical properties, including thermal (DSC, TGA), rheological (viscometer) and mechanical properties (texture analyzer) of food systems;
- (5) Understand the principles of chromatography (HPLC, GC) and mass spectroscopy (MS, LC-MS, GCMS);
- (6) Understand the principle and instrumentation of particle size measurements.

PROGRAM LEARNING GOAL (S) SATISFIED BY THIS COURSE:

LG #2: Graduates will demonstrate and apply knowledge of the core competencies in Food Chemistry and analysis.

Student Learning Goals and Outcome

- 2.1:** Understand the chemistry involved in the properties and reactions of various foods and its components.
- 2.2:** Understand and effectively applies the principles behind analytical techniques associated with food.
- 2.3:** Understand and effectively applies food chemistry and analysis methods.

FURTHER INFORMATION ON THE COURSE:

Text Book: **Food Analysis**, 4th Edition, by S. S. Nielsen
 All course material can be found at Sakai: 11:400:304 Food Analysis

Grading (Total 100%):
 Home work & Lab reports 25% Quiz 15%
 Mid-term 30% Final 30%

Lecture 1: Introduction	1/22/2019
Lecture 2: Evaluation of Analytical Data	1/25/2019
Lecture 3: pH and Titratable Acidity	1/29/2019
Lecture 4: pH Meter and Buffer capacity (1)	2/1/2019
Lecture 5: Buffer Capacity (2)	2/5/2019
Lecture 6: Basic Principles of Chromatography (1)	2/8/2019
Lecture 7: Basic Principles of Chromatography (2)	2/12/2019
Lecture 8: Basic Principles of Chromatography (3)	2/15/2019
Lecture 9: Basic Principles of Chromatography (4)	2/19/2019
Lecture 10: High Performance Liquid Chromatography	2/22/2019
Lecture 11: Basic Principles of Spectroscopy	2/26/2019
Lecture 12: Introduction of UV Spectroscopy (1)	3/1/2019
Lecture 13: UV Spectroscopy and Instrumentation (2)	3/5/2019
Lecture 14: Fluorescence Spectroscopy (1)	3/8/2019
Lecture 15: Fluorescence Spectroscopy (2) and Review of exam	3/12/2019
Mid-term	3/15/2019
Lecture 16: Infrared (1)	3/26/2019
Lecture 17: Infrared (2)	3/29/2019
Lecture 18: Infrared (3)	4/2/2019
Lecture 19: Rheological Principles for Food Analysis (1)	4/5/2019
Lecture 20: Rheological Principles for Food Analysis (2)	4/9/2019
Lecture 21: Gas Chromatography (1)	4/12/2019
Lecture 22: Gas Chromatography (2)	4/16/2019
Lecture 23: Mass Spectrometry	4/19/2019
Lecture 24: Thermal Analysis (1)	4/23/2019
Lecture 25: Thermal Analysis (2)	4/26/2019
Lecture 26: Particle Size Analyzer	4/30/2019
Lecture 27: Review for Final Exam	5/3/2019
Final Exam (temporary)	5/10/2019

STUDENT WELLNESS SERVICES

Just In Case Web App <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932- 1181.

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation:

<https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at:

<https://ods.rutgers.edu/students/registration-form>.

Scarlet Listeners

(732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.