

Rutgers University
School of Environmental and Biological Sciences
Department of Food Science

Nutrigenomics
Syllabus – Spring 2020

COURSE INFORMATION

Title: Nutrigenomics
Course Number: 16:400:532:01/11:400:410
Lecture Time/Location: Tuesday, 5:35 - 8:15 pm / Rm 101

INSTRUCTOR INFORMATION

Instructor:	Laura Rokosz, Ph.D.
Phone:	908-764-9062
E-Mail:	egglock@comcast.net
Office Hours:	By appointment (Live or Virtual)

COURSE DESCRIPTION

Nutrigenomics is the study of the interaction between nutrients and other dietary bioactives on gene expression. This rapidly emerging applied science demonstrates how common food ingredients affect health by altering the expression of genes and the structure of an individual's genome. Through an understanding of how nutrients interact with the genome and the mechanism of action of nutraceuticals and dietary supplements in cells, novel treatment of important diseases may be addressed through improved nutrition or the development of targeted health promoting foods and beverages.

This course will explore the science of nutrigenomics and focus on those plant and animal nutraceuticals that provide important health, wellness and comfort benefits. Common ailments will be discussed along with the role bioactives play in their

suppression and/or remedy. Additionally, this course will investigate the nature and type of specific nutraceuticals, their origin, mechanism(s) of action and the potential benefits they offer. We will also have an in depth look at the role that nutrients play in gut health and gut-brain interactions.

EDUCATIONAL PHILOSOPHY & INSTRUCTIONAL METHODS:

The course incorporates a variety of learning opportunities and measures. Critical thinking on food science topics related to nutrition, molecular biology, biology and chemistry are incorporated throughout. The material is technical in nature and provides students with multiple learning media, including assigned readings, class lectures and notes, videos, practical application of information, group activities, two written exams, a research report and an oral presentation via podcasting. Guest lecturers with expertise in various areas of Integrative Healthcare will share their experience in the application of Nutraceuticals and Nutrigenomics in healthcare.

Suggested and Mandatory Readings

Mandatory text for Nutrigenomics section

1. Nutrigenomics and Nutrigenetics in Functional Foods and Personalized Nutrition - Edited by Lynette R. Ferguson (<http://www.amazon.com/Nutrigenomics-Nutrigenetics-Functional-Personalized-Nutrition/dp/1439876800>)
2. Nutrigenetics – Edited by Doris Corella ISBN 978-3-03842-996-8 (PDF) http://www.mdpi.com/journal/nutrients/special_issues/nutrigenetics

Suggested text for Nutrigenomics section

3. Clinical Nutrition - A Functional Approach, Second Edition – Edited by DeAnn Liska, Sheila Quinn, Dan Lukaczer, David S. Jones, Robert H. Lerman (https://www.functionalmedicine.org/listing_detail.aspx?id=2361&cid=34)

Suggested text for Nutraceuticals section

4. Nutraceuticals and Functional Foods – Edited by Robert Wildman (<http://www.amazon.com/Handbook-Nutraceuticals-Functional-Second->

[Nutrition/dp/0849364094/ref=sr_1_fkmr0_1?s=books&ie=UTF8&qid=1325517408&sr=1-1-fkmr0\)](https://www.amazon.com/Handbook-Nutraceuticals-Ingredients-Formulations-Applications/dp/0849364094/ref=sr_1_fkmr0_1?s=books&ie=UTF8&qid=1325517408&sr=1-1-fkmr0)

5. Handbook of Nutraceuticals Vol I – Yashwant Pathak
[http://www.amazon.com/Handbook-Nutraceuticals-Ingredients-Formulations-Applications/dp/1420082213/ref=sr_1_fkmr1_1?s=books&ie=UTF8&qid=1325517456&sr=1-1-fkmr1\)](https://www.amazon.com/Handbook-Nutraceuticals-Ingredients-Formulations-Applications/dp/1420082213/ref=sr_1_fkmr1_1?s=books&ie=UTF8&qid=1325517456&sr=1-1-fkmr1)

GRADING:	(points)	
Class Attendance**	5	
Class Participation	10	
Exams		
Exam#1 – Midterm exam	20	
Written Project on Nutrigenomics	25	
Class presentation/podcast on Nutraceutical applications	20	
Exam #2 – Final Exam	25	
Extra credit – Guest speaker report*	5	
TOTAL	110	

**You will not be penalized for class attendance but you may not earn credit if you have more than two absences.

SEMESTER COURSE OUTLINE

Date	Topic	Exam/Project	Reading Material/Assignment See Canvas for all reading materials
Jan 21	<ul style="list-style-type: none"> • Introductions, Review of Syllabus and Course Materials • Introduction to Nutraceuticals and Nutrigenomics 		Ferguson Chapter 1
Jan 28	Nutrigenetics and Nutrigenomics Solute Carrier SNPs		Ferguson Chapter 2 Corella pp191-207 Corella pp53-68
Feb 4	Epigenetics		Ferguson Chapter 12 Corella pp 83-99 Corella pp142-153
Feb 11	Obesity and Diabetes	Instructions for Nutrigenomics report with template	Ferguson Chapter 6 Corella pp 1-18

Date	Topic	Exam/Project	Reading Material/Assignment See Canvas for all reading materials
Feb 18	Heart Disease and Lipid Metabolism		Ferguson Chapters 3, 5 Corella 19-35 Corella 69-82
Feb 25	Inflammatory Bowel Diseases Gut-Brain/Microbiome		Ferguson Chapters 7, 8, 9 MidTerm review
Mar 3	Midterm, open book	Lectures Jan 22-Feb 26	Multiple choice, fill-in, essays
Mar 10	Guest Lectures: Apostolos Pappas Skin health and nutrition	Podcast Instructions	Guest Lecture extra credit
Mar 17	Spring Break		Select topic and work on Podcast
Mar 24	Microbiome, Resistent Starch, Rhonda Witwer Gut Health and disease		Guest Lecture extra credit
Mar 31	Guest Lecturer: Herbal Medicine: Dr. Glenn Gero Hormones and Immunity		
Apr 7	The Nutrigenomic Toolkit, Precision Nutrition		Ferguson Chapters 4, 10, 11, 14 Corella 159-175
Apr 14	Cancer, Functional Foods, Medical Foods, and GMO Foods		Corella pp 36-52 Corella 100-111
Apr 21	Foodomics, DNA testing Crisper technology Nutrigenomics and public health Personalized Nutrition		Ferguson Chapter 13, 16, 18, 20, 21 Corella 131-134
Apr 28	Class podcasts Q&A	Record Podcasts in class	Distribute Final exam: Due May 14th
May 5	Reading Period		Written report due Please place in Food Sci mail box (in office area, not mail room)
May 12	Final exam-Take home Lectures Mar 12-Apr 21	Podcasts	Extra credit report due Hand in Final exam

GRADING

89.5-100	A
84.5-89.49	B+
79.5-84.49	B
74.5-79.49	C+
69.5-74.49	C
59.5-69.49	D
0-59.49	F

"IN" grade: "Incomplete" is used only in courses offered by the graduate schools. Anyone to whom you assign an "IN" may have any time period you agreed-upon (up to one year to complete the work, but up to two years in Graduate School of Education and College of Pharmacy, Pharm.D. courses). It is your responsibility to see that the agreed-upon date is adhered to, and to Change the Grade Online, see:

<http://nbregistrar.rutgers.edu/facstaff/grades.htm>. "IN" becomes a permanent grade after one year, except in the Graduate School of Education where it converts to NO/CR and in the College of Pharmacy, Pharm.D. where it converts to "F" after two years.

DEPARTMENT POLICIES AND EXPECTATIONS FOR STUDENT PERFORMANCE

Graduates of the department receive degrees as food science professionals, and professional behavior constitutes a key component of our academic programs. The department expects all students – at any level and in any program to:

- Attend classes.
- Come to class on time.
- Complete reading on schedule, when applicable.
- Complete all course Readings on time.
- Write using correct format, grammar, spelling, and reference style.
- Turn in work that meets ethical standards and is not plagiarized.
- Take responsibility for obtaining and making up missed work.
- Finish all course work by the end of the semester.
- Inform instructors *in advance* if classes need to be missed.
- Provide documentation to support reasons for missing class, assignments and examinations.

Department policies

Grading: takes the above standards into consideration and applies penalties for failure to meet them. Instructors are *not required* to read or give a passing grade to work that is late, incomplete, or inadequately prepared.

PODCASTS

1. Working in pairs research a health concern of somewhat recent controversy and discuss how these concerns can be addressed using Nutrigenetic and Nutrigenomic data. The Podcast may be recorded during class or you may pre-record your podcast and share it during class. You will be asked why your topic is a relevant health concern? Has it been in the news lately, and if so, in what capacity? Is there any Nutrigenomic, Nutrigenetic or epigenetic data that informs on the cause and/or solution? If not, do you think these healthcare tools can be used to tease out a solution? Please explain.
2. Limit the Podcast to no more than 20 minutes and no less than 10 minutes.
3. Allow 5-10 min for Q & A from the class.

WRITTEN REPORT

- The term paper will relate Nutrigenomic and Nutrigenetic concepts to one of the therapeutic areas covered during class. Other disease areas are acceptable pending approval by your professor. A template for the report will be distributed on February 11, 2020.

EXTRA CREDIT REPORT

- You are welcome to submit a one- to two-page report summarizing the content of the guest speakers' presentations. Select ONE speaker for your report.

University Calendar, Notable dates for Spring 2020:

Spring Semester Begins	Tuesday, January 21
Last Day to DROP a class without a "W" grade	Tuesday, January 28
Last Day to ADD a class	Wednesday, January 29
Undergraduates—Deadline for completing Incomplete grades from Fall or Winter before being converted to "F" grade	Saturday, February 1
Last Day to Withdraw from All Courses with 100% Refund	Monday, February 3
Registration for Summer Session Classes Begins	Monday, February 17

Last day to withdraw from ALL classes in order to receive tuition refund. For all Refund Policy Information, please see: http://www.studentabc.rutgers.edu/withdrawals .	Monday, February 3
Spring Recess—University Offices Open—No Classes	Saturday, March 14 - Sunday, March 22
Diploma Application Period for May Graduation Ends	Sunday, March 1
Fall 2020 Term Classes Visible	To be determined
Registration for Fall 2020 Term Classes Begins	Monday, April 6 (subject to change)
Last day to WITHDRAW from an individual class with a "W" grade. Deadline 5:00 p.m	Tuesday, March 31
Last day to WITHDRAW from ALL CLASSES (withdraw from term) with "W" grades(s). Deadline 5:00 p.m.	Monday, April 20

Rutgers Academic Integrity

- <http://academicintegrity.rutgers.edu/academic-integrity-policy/>
- https://slwordpress.rutgers.edu/academicintegrity/wp-content/uploads/sites/41/2014/11/AI_Policy_2013.pdf

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

1/30/20

(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.