

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

**NUTRIGENOMICS
Syllabus – Spring 2017**

COURSE INFORMATION

Title: NUTRIGENOMICS

Course Number: 16:400:532/11:400:410

Lecture Time/Location: Tuesday, 5:35 - 8:35 pm / Rm 107

INSTRUCTOR INFORMATION

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

PRE-REQUISITES

General Chemistry (01:160:161-162) & General Biology (11:119:115-117) & Nutrition and Health (11:709:255) OR Food and Health (11:400:104) OR Science of Food (11:400:103)

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. Regulatory and labeling impact on functional food production will also be presented along with analytical methods for the characterization of nutraceuticals. The course will also investigate opportunities for commercial development of functional and genotype-specific personalized foods and beverages of the future with focus on market-driving factors.

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 in-class presentation.

Suggested Readings

Suggested 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. 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

3. 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)
 4. 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)
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GRADING: (%)

| | | |
|--|-----------|-------------------------------|
| Class Attendance | 5 | |
| Class Participation | 5 | Group Projects |
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| | | |
| Exams | | |
| Exam#1 – Midterm exam | 30 | |
| Written Project on Nutrigenomics | 15 | |
| Class presentation on Nutraceutical applications | 15 | |
| Exam #2 – Final Exam | 30 | |
| Extra credit – Guest speaker report* | 10 | |
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| TOTAL | 100 | *Up to 110% with extra credit |

SEMESTER COURSE OUTLINE

| Date | Topic | Exam/Project Date | Assignment |
|--------|--|------------------------|----------------------------------|
| Jan 17 | Introduction to Nutraceuticals Phytonutrients | | |
| Jan 24 | Herbal and Dietary Supplements | | |
| Jan 31 | Plant-based proteins and whole grains | | |
| Feb 7 | Group project planning | | Work in groups on presentation |
| Feb 14 | Nutraceuticals and Cancer | | |
| Feb 21 | Inflammation and Immunity | | |
| Feb 28 | Cardiovascular disease and Diabetes | | |
| Mar 7 | Midterm | Lectures Jan 17-Feb 28 | Multiple choice, fill-in, essays |

| Date | Topic | Exam/Project Date | Assignment |
|--------|--|----------------------------|-------------------------|
| Mar 14 | Spring Break | | |
| Mar 21 | Introduction to Nutrigenomics and Nutrigenetics | | Present group projects |
| Mar 28 | Micronutrients Good fats, Bad fats | Distribute report template | Select topic for report |
| Apr 4 | Microbiome, Gut Health Guest speaker | | |
| Apr 11 | The Nutrigenomic Toolkit Personalized Nutrition | | |
| Apr 18 | Epigenetics, DNA testing Foodomics | | |
| Apr 25 | Final exam | Lectures Mar 21-Apr 18 | Written report due |
| May 2 | Final exam snow day | | Extra credit report due |

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.

CLASS PRESENTATIONS

1. Upon approval of a topic, research the topic and develop a PowerPoint presentation to present highlights of your findings, per our class discussion.
2. Limit the presentation to a total of 20 slides with an additional slide for References
3. Your presentation should NOT EXCEED 20 MINUTES in total. This represents approximately 12-15 slides of presentable material (not counting title, subtitles and references). Allow five min per presentation for Q&A.

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 March 28, 2017.

University Calendar, Notable dates for 2017:

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| Last day to DROP ALL CLASSES and receive 100% refund | Friday, January 13 |
| Martin Luther King, Jr. Day—All University Offices Closed—No Classes | Monday, January 16 |
| Spring Semester Begins | Tuesday, January 17 |
| Last Day to DROP a class(es) WITHOUT a W grade | Tuesday, January 24 |
| Last Day to ADD a class(es) | Wednesday, January 25 |
| Undergraduates—Deadline for completing Incomplete grades from Fall or Winter before being converted to "F" grade | Wednesday, February 1 |
| 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 | TBD |
| Academic Warning Grades Submitted | Monday, February 27 - Friday, March 10 |
| Spring Recess—University Offices Open—No Classes | Saturday, March 11 - Sunday, March 19 |
| Last day to WITHDRAW from a class, or all classes, with a W grade. Deadline 5:00 p.m | Monday, April 3 |
| Fall "TZ" and "NG" Grades Automatically Converted to "F" after 5:00 p.m | Monday, May 1 |
| Regular Classes End | Monday, May 1 |
| Reading Days | Tuesday, May 2 & Wednesday, May 3 |

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| Final Exam Period | Thursday, May 4 - Wednesday, May 10 |
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ACADEMIC INTEGRITY

The University's policy on Academic Integrity is available at

<http://academicintegrity.rutgers.edu/academicintegrity-policy>

The principles of academic integrity require that a student:

- properly acknowledge and cite all use of the ideas, results, or words of others.
- properly acknowledge all contributors to a given piece of work.
- make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that

- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- all student work is fairly evaluated and no student has an inappropriate advantage over others.
- the academic and ethical development of all students is fostered.
- the reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

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.