University of Puerto Rico
Río Piedras Campus
College of Natural Sciences
Nutrition and Dietetics Program
Program: Bachelor of Science in Nutrition and Dietetics

Human Nutrition II- NUTR 4042

Monday / Wednesday, 3:00 p.m.– 5:20 p.m.
Room EFAN 105

Course Title: Human Nutrition II
Code: NUTR 4042
Credits: Three (3) credits
Meeting time and dates: Section OU1; Mondays and Wednesdays, 3:00 p.m.-5:20 p.m.
Course Location: EFAN 105
Professor: Nancy Correa-Matos, PhD, RDN, LND
Professor's Office: EFAN - 104
Office hours: By appointment,
Mondays: 7:30 a.m.- 8:30 a.m.; 11:00 a.m.-12:00 p.m.; 1:00 p.m.- 3:00 p.m.
Wednesdays: 7:00 a.m.- 8:30 a.m.; 11:00 a.m.-11:30 a.m.
Phone number: 787-764-0000 Ext. 88581
Email: nancy.correa@upr.edu

Pre-requisites: NUTR 4041, 4045, 4158, 4159; BIOL 3712

Additional Requirements: Calculator, basic computer skills and access to the Internet

Course Description:
The course is the integration of the contribution of various scientific disciplines in the advanced study of nutrition. The biochemical and physiological basis of nutrition will be emphasized. Includes a critical review of recent nutrition literature.

Course Objectives:
Upon completion of the course NUTR 4042, each student should have acquired the knowledge and skills to:

1. Summarize the roles of nutrients in the biochemical processes that occur in the organelles of different cells. (Chapter 1)
2. Explain the effects of gastrointestinal hormones on food intake, digestion, absorption, and transport of nutrients and bioactive compounds. (Chapter 2)
3. Explain different methods used in the determination of body composition
4. Explain the factors that affect basal metabolism. (Chapter 8)
5. Calculate, using several methods, the total energy needs of an individual. (Chapter 8)
6. Explain the relationship between nutrition and the various systems and organs of the human body. (Chapters 3-14)
7. Explain how hereditary and environmental factors may affect human nutrition and body functions. (Chapters 1 and supplemental materials)
8. Contrast the role of nutrients in the structure, function and maintenance of body systems in health and pathological states. (Perspectives)
9. Integrate the role of vitamins and minerals in carbohydrate, lipid and protein metabolism. (Chapters 3-14)
10. Demonstrate effective use of technology during the revision of the scientific literature in the development of a critical review on a current nutrition topic. (Assignments)
11. Critically analyze and interpret the results and conclusions of scientific investigation in the field of nutrition. (Final Project)
12. Contribute to the effective inclusion of fellow students with special needs in course activities. (all)

Knowledge Requirements and Learning Outcomes:
Upon completion of the course, NUTR 4042, each student should have acquired the foundation knowledge and skills, as established by the Academy of Nutrition and Dietetics' Accreditation Council for Education in Nutrition and Dietetics revised standards of January 2012, and is able to carry out these additional objectives:

KRDN 1.1 Demonstrate how to locate, interpret, evaluate and use professional literature to make ethical, evidence-based practice decisions.

KRDN 1.2 Use current information technologies to locate and apply evidence-based guidelines and protocols.

KRDN 1.3 Apply critical thinking skills.

KRDN 2.1 Demonstrate effective and professional oral and written communication and documentation.

An additional Learning Outcome on Critical Thinking Skills will be assessed using the criteria of 1) identification of the problem/issue, 2) analysis/investigation of the problem/ issue, 3) credibility of sources/materials, and 4) creativity reflecting in-depth student engagement, according to the UPR-RP evaluation plan.

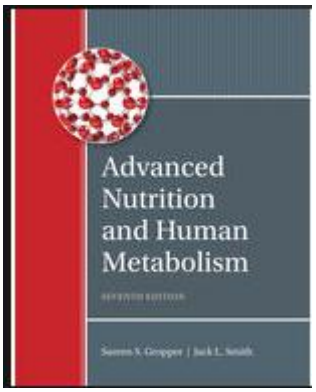
Mission of the Didactic Program in Dietetics:

The mission of the Didactic Program in Dietetics is to provide the academic preparation necessary to form Nutritionists-Dietitians qualified to offer educational, administrative and clinical services in medical nutritional therapy and in the management of food service systems. The Program capacitates professionals to work in different scenarios within an ever-changing and culturally diverse society. The integration of knowledge and skills specialized in foods and nutrition will permit the graduates to promote the general welfare of the individual, the family and the community, helping them to obtain optimal nutrition in health or in sickness throughout their life cycle.

Course Topics and Time Distribution: (Look for the course schedule at the end of the syllabus)

1. Problems of nutrition and health in Puerto Rico -2 h
2. Study design and critical interpretation of research -2 h
3. Dietary Guidelines, Physical Activity Guidelines; Cells, organelles, and differential functions -4h
4. Body composition models and methods- 3h
5. Energy intake, energy expenditure, and energy balance; hormonal control- 4h
6. Digestive system and hormonal control; Microbiota and obesity -5h
7. Dietary and body lipids, adipocyte, cytokines and hormones – heart health; Integrated metabolism – starvation -4h
8. Fluid and electrolyte balance – water, sodium, potassium, chloride, hormones, hypertension – heart health -4h
9. Dietary and body carbohydrates, hormones, dietary fiber, chromium; Integrated metabolism – diabetes; Alternative sweeteners- 5h
10. Dietary and body protein, myocyte, exercise biochemistry, hormones; Integrated metabolism – stress 4h
11. Antioxidants in health and disease – vitamins C, E, selenium, zinc, copper, manganese, carotenoids, flavonoids -3h
12. Bone health – calcium, phosphorus, magnesium, vitamin D endocrine system, vitamin K
13. Eye health – vitamin A, carotenoids -3h
14. Central nervous system and brain health, neurotransmitters, hormones, fatty acids, B vitamins, choline; neurodegenerative disease -4h
15. Coenzymes in macronutrient metabolism and bioenergetic pathways – B vitamins, magnesium -4h
16. Hematopoiesis, erythroblast – iron, vitamin B12, folate, vitamin B6, vitamin C; anemias - 4h

17. Other microminerals and ultra-trace elements- 2h
18. Nutrient interactions-2h

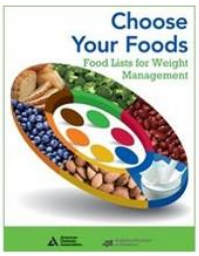


Required Texts:
Gropper, S. S. & Smith, J. L. (2018). Advanced nutrition and human metabolism (7th ed.). Belmont, CA: Wadsworth, Cengage Learning.
E-book: ISBN-10: 1337531332; ISBN-13: 9781337531337
Hard Copy: ISBN-13: 978-1305627857

Dietary Reference Intake series available on-line at www.nap.edu

Support Texts:
Mahan, L. K., Escott-Stump, S. & Raymond, J. (2017). Krause's food & the nutrition care process (14th ed.). St. Louis, MO: Saunders-Elsevier. **ISBN-13: 9780323340755**.

Thompson JJ, Manore M, Vaughan L (2017). The Science of Nutrition, 4th Edition, Pearson Ed, AZ. **ISBN-13: 978-0134166001.**



Choose Your Foods: Food Lists for Weight Management Academy of Nutrition and Dietetics and American Diabetes Association
ISBN: 978-0-88091-389-8

Evaluation Methods:
Student Evaluation: If necessary, differentiated evaluation may be carried out for students with special needs or impediments according to an individualized plan through official UPR recommendations; therefore, it is important that the student inform the professor in writing as soon as possible, in order to identify needs and establish the plan**.**

Grade Breakdown:

- Quizzes or exams = 60% (3 EXAMS 100 points each)
- Assignments/quizzes (50 points) and oral presentation (25 points) = 15% (75 points)
- Written Critical Review of a current topic in nutrition = 20% (100 points)
- Class Attendance & Participation = 5% (25 points)

Grade Scale:

90 – 100, A

80 – 89, B

70 – 79, C

60 – 69, D

< 59 , F

IMPORTANT NOTE: No "special assignments" will be given or accepted on an individual basis at the end of the semester to better a student's grade. Remember, it is a requirement that all Nutrition and Dietetics students pass all science core and NUTR specialty courses with a "C" or better in order to continue the course sequence and to graduate. In addition, students will be required to get special permission to re-take a course more than twice.

Exam and quizzes: Each quiz/exam will cover the material discussed in class and in the essential references. The final exam, in addition to the new material, will have comprehensive questions over the knowledge acquired throughout the semester. Reading comprehension and critical thinking skills will be tested by including abstracts from scientific journal articles (usually in English) with related questions. Cell phones and beepers must be turned off, and you must remain in the classroom (no use of cell phone calculators permitted). All answers must be yours; answers must be recorded in blue, black ink, or pencil.

Assignments: The assignments will be designed to help you dominate material and integrate advanced nutrition concepts. They are to be turned in at the beginning of the class on the due date, according to the specific instructions given. Complete bibliographies (APA style or AJCN, assigned by professor) of references used must be included in all assignments. Specific point values will be provided with each assignment. Deadlines are not flexible; late assignments will not be accepted.

Written Critical Review: A specific advanced nutrition topic, approved by the professor, will be developed into a 10 or more pages (excluding references) critical review of current nutrition research, and turned in on paper (Size of letter 12 font , 1 inches margins, 1.5 space, Times New Roman or Calibri) Details and student evaluation will be discussed in class and documents made available in Moodle.

Class attendance and participation:

Given the nature of this course, class attendance and participation are extremely important and is taken into consideration for final grade. It is assumed that all students will attend both lectures each week, be in class on time and be in attendance in class the entire time. Attendance will be taken daily. To facilitate the attendance-taking process, a course roster will be disseminated at the beginning of class which students will sign and return to the professor immediately. Concurrently, the professor will call names. Any student who does not sign the form or acknowledge their presence during roll call will be considered absent. Tardiness and leaving early is disruptive to the class and to the professor and is therefore discouraged. If you are not present by the time attendance is taken, you will be considered absent. Similarly, if you leave before I excuse the class, you will also be considered absent.

If you attend the class, but are working on other class assignments, text messaging or not paying attention, will be considered an absence as per the instructor discretion. If the class has to be interrupted due to chatting during class, 5 points will be deducted each occurrence.

Students are responsible for getting notes and assignments from their peers (not the professor) if they miss class for any reason. Students can miss three classes without notification, and after that, 4 points will be deducted from the totals assigned for class attendance.

INSTRUCTIONAL TECHNIQUES:
The course will include lecture, discussions, assignments, and students' presentations. Evaluation methods include quizzes or exams, presentations, papers and other assignments. Specific directions for assignments and papers will be posted in Moodle.

The professor will use the university's Moodle system to disseminate Power Point slides, general course information, and test grades. Therefore, all students are required to access their UPR.EDU e-mail and Moodle. If this is your first experience with Moodle, you are encouraged to attend the courses offered by CEA (Centro Excelencia Académica- http://cea.uprrp.edu/). Students are encouraged to check the upr.edu e-mail account regularly (i.e., before each class) for class announcements.

Students are responsible for signing up for and following this course, NUTR 4042- Human Nutrition II, in the electronic learning platform Moodle using the provided password/code, in order to access course documents and assignments. In addition, Moodle will serve as the source for e-mail generated communications from the professor. Students are responsible for printing their course materials, and for following instructions related to each particular assignment.

GENERAL RULES:

Plagiarism:
ALL of your written assignments and opportunities should be your own intellectual work. Plagiarism, or presenting the words or ideas of another person as your own, is a form of fraud and will not be tolerated; it is a direct violation of the University's Policy on Non-Ethical Intellectual and Scientific Conduct. Papers containing plagiarism will automatically receive the grade of "F". Other examples of plagiarism include cutting and pasting from digital / electronic sources; this is inappropriate even if you cite where you got the information. When you are asked to synthesize information from a literature source, it must be in your own words (not a direct quote). The learning objective is for the student to demonstrate that he/she sufficiently under-stands the information obtained from the literature to present it in his/her own words.

Cheating and academic dishonesty will not be tolerated; suspicious activity will result in a zero.

Academic Integrity:
The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Article 6.2 of the UPR Students General Bylaws (Board of Trustees Certification 13, 2009-2010) states that academic dishonesty includes, but is not limited to: fraudulent actions; obtaining grades or academic degrees by false or fraudulent simulations; copying the whole or part of the academic work of another person; plagiarizing totally or partially the work of another person; copying all or part of another person answers to the questions of an oral or written exam by taking or getting someone else to take the exam on his/her behalf; as well as enabling and facilitating another person to perform the aforementioned behavior. Any of these

behaviors will be subject to disciplinary action in accordance with the disciplinary procedure laid down in the UPR Students General Bylaws.

Law of Integrated Educational Services for People with Disabilities (Law 51, June 7, 1996):
Students who receive Vocational Rehabilitation should communicate with the professor at the beginning of the semester in order to plan for reasonable accommodation and/or acquisition of needed special equipment, according to the recommendations of the Office for Persons with Impediments of the Deanship of Student Affairs (Oficina de Asuntos para las Personas con Impedimentos, OAPI, Decanato de Estudiantes; Circular #9, 2002-2003, DAA).

Reasonable Accommodation:
The University of Puerto Rico complies with all state and federal laws and regulations related to discrimination, including "The American Disabilities Act" (ADA law) and Law #51 from the Puerto Rico Commonwealth (Estado Libre Asociado de Puerto Rico). Every student has the right to request and receive reasonable accommodation and Vocational Rehabilitation Services (VRS). Those students with special needs that require some type of particular assistance or accommodation shall explicitly communicate it directly to the professor. Students who are receiving VRS services shall communicate it to the professor at the beginning of the semester so that appropriate planning and the necessary equipment may be requested according to the Disabilities Persons Affairs Office (Oficina de Asuntos para las Personas con Impedimentos (OAPI)) from the Students' Deanship office. Any other student requiring assistance or special accommodation shall also communicate directly with the professor. Reasonable accommodations requests or services DO NOT exempt the student from complying and fulfilling academic and course related requirements and responsibilities.

Certification 112: (Spanish version: Certificación Núm. 112 (2014-2015) de la Junta de Gobierno):
"Guía para la creación, codificación uniforme y el registro de cursos en la Universidad de Puerto Rico, establece que es un curso en el cual el 75% o más de las horas de instrucción requieren la presencia física del estudiante y el profesor en el salón de clases. Esta definición posibilita, si así lo decide el profesor, en común acuerdo con los estudiantes matriculados, que el de las horas contacto de un curso presencial se ofrezcan usando otra modalidad. Debe quedar claro que solo hasta un máximo del de las horas contacto del curso, como lo establece la definición de curso presencial, pueden ejecutarse haciendo uso de la tecnología o de otras experiencias de aprendizaje, tales como excursiones, internados, aprendizaje en servicio, visitas instruccionales y otras de igual calidad académica. Por ejemplo, si el curso fue registrado como uno de 45 horas contacto, puede ofrecer hasta un máximo de 11.25 horas contacto haciendo uso de otra modalidad".

Student Handbook:
Students are also responsible for accessing and following the Student Handbook for the Nutrition and Dietetics Program, available online at the Program web page: http://nutricion.uprrp.edu/news/32/66/DPD-Manual-del-Estudiante-actualizado-enero-2015.

Classroom policies:
Civil Behavior: Article 2.9 Student Handbook

It is assumed that all students understand classroom decorum. However, in case there is any question, proper conduct is spelled out here. Proper conduct involves good attentiveness and cooperation in the class. Attentiveness and cooperation are defined as being in class on time, paying full attention to class lectures or other presentations, being involved in discussions, asking appropriate questions or making meaningful comments by raising a hand and being called upon, and remaining in place and attentive until dismissed by the professor.

Inappropriate behavior includes chatting with others during the lecture or discussions; using cell phones for any reason (calls, text messages, pics, etc.); using CD or MP-3 players or related equipment during class; allowing cell phones or pagers to ring (turn them off!); using a personal or university computer in class for reasons not related to this course, and otherwise being disruptive or discourteous to the professor or other students in the class. Using tobacco products of any kind in the classroom is prohibited. You are presumably here voluntarily to learn something. Discourteous or disruptive behavior will not be tolerated because it prevents that learning from taking place. Furthermore, students who are disruptive or discourteous will be dismissed from the class once and only once. If there is a second occurrence, the student will be referred to the Vice President for Student Affairs for permanent expulsion from the course.

Any activity from the student toward the instruction that can be considered a threat, disrespect or violence act will be notified immediately to the campus police and crisis management and a report will be filled against the student.

Use of the computers:
The use of computers in the classroom is not allowed in the course

Email communications:
Respect is expected. You can expect that I will treat you with respect and I will do the same. This infers that you will email me (Dr. Correa-Matos) and your classmates in a respectful manner. Each email should adhere to the following guidelines:
1. Insert in the subject line "NUTR 4042 Second Semester"...
2. Include your full name.
3. Address me as Dr. Correa-Matos, not Ms. or Mrs.
4. Use proper punctuation and grammar.
3. You are responsible for frequently checking announcements in Moodle and your email.
4. It is your responsibility to understand and comply with all course requirements.

Sources for peer-reviewed journals:
Nutrition Reviews (Journal)
Nutrition Today (Journal)
American Journal of Clinical Nutrition (Journal)
The Journal of Nutrition (Journal)
Metabolism (Journal)
Journal of the Academy of Nutrition and Dietetics

Other Food/Nutrition/Metabolism Journals

Selected links:

1. Guía de Sana Alimentación y Actividad Física para Puerto Rico, 2017: http://www.salud.gov.pr/Dept-de-Salud/Documents/Comision%20de%20Alimentacion%20y%20Nutricion%20de%20Puerto%20Rico/GuiaAlimentaria.pdf
2. MyPlate http://www.choosemyplate.gov/
3. Dietary Reference Intakes. http://fnic.nal.usda.gov/dietary-guidance/dietary-reference-intakes
4. Practice Paper of the American Dietetic Association: Using the Dietary Reference Intakes http://www.adajournal.org/article/S0002-8223%2811%2900285-9/abstract

Selected references from journals:

Alharbi O, El-Sohemy A. (2017) Lactose Intolerance (LCT-13910C>T) Genotype Is Associated with Plasma 25-Hydroxyvitamin D Concentrations in Caucasians: A Mendelian Randomization Study. J Nutr. Jun;147(6):1063-1069.

Fatima J, Iqbal CW, Houghton SG, Kasparek MS, Duenes JA, Zheng Y, Sarr MG. (2009) Hexose Transporter Expression and Function in Mouse Small Intestine: Role of Diurnal Rhythm. J Gastrointest Surg 13:634–641.
Goodwin K, Abrahamowicz M, Leonard G, Perron M, Richer L, Veillette S, Gaudet D, Paus T, Pausova Z. (2015) Dietary Vitamin A and Visceral Adiposity: A Modulating Role of the Retinol-Binding Protein 4 Gene.J Nutrigenet Nutrigenomics; 8(4-6):164-73.

Kairupan TS, Amitani H, Cheng KC, Runtuwene J, Asakawa A, Inui A. (2016) Role of gastrointestinal hormones in feeding behavior and obesity treatment. J Gastroenterol. Feb;51(2):93-103.

Kamanna VS, Kashyap ML (2008). Mechanism of action of niacin. Am J Cardiol. Apr 17;101(8A):20B-26B.

Ladeira C, Pádua M, Veiga L, Viegas S, Carolino E, Gomes MC, Brito M. (2015) Influence of Serum Levels of Vitamins A, D, and E as well as Vitamin D Receptor Polymorphisms on Micronucleus Frequencies and Other Biomarkers of Genotoxicity in Workers Exposed to Formaldehyde. J Nutrigenet Nutrigenomics;8(4-6):205-14.

Mifflin MD, St Jeor ST, Hill LA, Scott BJ, Daugherty SA, Koh YO. (1990) A new predictive equation for resting energy expenditure in healthy individuals. Am J Clin Nutr. Feb;51(2):241-7.

Neis EP, Dejong CH, Rensen SS (2015) The role of microbial amino acid metabolism in host metabolism. Nutrients. Apr 16;7(4):2930-46.

Nie C, He T, Zhang W, Zhang G, Ma X. Branched Chain Amino Acids: Beyond Nutrition Metabolism. Int J Mol Sci. 2018 Mar 23;19(4).

Owen P. McGuinness (2005). Defective glucose metabolism during infection. Annu. Rev. Nutr. 25:9–35.

Saad MJ, Santos A, Prada PO. (2016) Linking Gut Microbiota and Inflammation to Obesity and Insulin Resistance. Physiology (Bethesda). Jul;31(4):283-93.

Sharma S, Puri S (2015) Prebiotics and Lipid Metabolism: A Review. Altern Ther Health Med. Aug;21 Suppl 3:34-42.

Spencer JP (2009) Flavonoids and brain health: multiple effects underpinned by common mechanisms. Genes Nutr. Dec;4(4):243-50.

Thakur K, Tomar SK, Singh AK, Mandal S, Arora S. (2016) Riboflavin and health: A review of recent human research. Crit Rev Food Sci Nutr. Mar 30.

Wiseman EM, Bar-El Dadon S, Reifen R. (2017) The vicious cycle of vitamin a deficiency: A review. Crit Rev Food Sci Nutr. Nov 22;57(17):3703-3714. doi: 10.1080/10408398.2016.1160362. Review.

Other Selected References:

Centers for Disease Control and Prevention. (2013). FastStats: Puerto Rico Facts. Retrieved from http://www.cdc.gov/nchs/fastats/popup_pr.htm

De La Torre, C. L., Ramírez-Marrero, F. A., Martínez, L. R., & Nevárez, C. (2010). Predicting resting energy expenditure in healthy Puerto Rican adults. Journal of the American Dietetic Association, 110, 1523-1526.

Devlin, T. (Ed.). (2010). Textbook of biochemistry with clinical correlations (7th ed.).Hoboken, NJ: John Wiley & Sons.

Gibson, R. S. (2005). Principles of nutritional assessment (2nd ed.). Oxford: Oxford University Press.

Gropper, S. S. (2000). The biochemistry of human nutrition. A desk reference. (2nd. Ed.). Stamford, CT: Wadsworth, Thomson Learning.

Gropper, S. S. & Smith, J. L. (2013). Advanced nutrition and human metabolism (6th ed.). Belmont, CA: Wadsworth, Cengage Learning.

Linder, M.C. (Ed.). (1991). Nutritional biochemistry and metabolism with clinical applications (2nd ed.). New York: Elsevier.

Lodish, H., Berk, A., Kaiser, C. A., Krieger, M., Bretscher, A., Ploegh, H., … Scott, M. P. (2013). Molecular cell biology (7th ed.). New York: W. H. Freeman.

Mahan, L. K., Escott-Stump, S. & Raymond, J. (2012). Krause's food & the nutrition care process (13th ed.). Philadelphia: Saunders-Elsevier.

Mougios, V. (2006). Exercise biochemistry. Champaign, IL: Human Kinetics.

Murray, R. K., Granner, D. K., & Rodwell, V. W. (2006). Harper's illustrated biochemistry (27th ed.). New York: Lange Medical Books/McGraw-Hill.

Nelson, D.L. & Cox, M.M. (2013). Lehninger principles of biochemistry (6th ed.). New York: W.H. Freeman and Company.

Nordin, S. M., Boyle, M., & Kemmer, T. M. (2013). Position of the Academy of Nutrition and Dietetics: Nutrition security in developing nations: Sustainable food, water, and health. Journal of the Academy of Nutrition and Dietetics, 113(4), 581-595. doi: 10.1016/j.jand.2013.01.025.

O'Sullivan Maillet, J., Schwartz, D. B., & Posthauer, M. E. (2013). Position of the Academy of Nutrition and Dietetics: Ethical and legal issues in feeding and hydration. Journal of the Academy of Nutrition and Dietetics, 113(6), 828-833. doi: 10.1016/j.jand.2013.03.020.

Rhoades, R., A. & Bell, D. R. (2009). Medical Physiology: Principles for Clinical Medicine (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott, Williams & Wilkins.

Rolfes, S. R., Pinna, K., & Whitney, E. (2012). Understanding normal and clinical nutrition (9th ed.). Belmont, CA: Wadsworth, Cengage Learning.

Shils, M. E., Shike, M., Ross, A. C., Caballero, B., & Cousins, R. J. (Eds.) (2006). Modern nutrition in health and disease (10th ed.). Philadelphia: Lippincott, Williams & Wilkins.

Torres, L. (2002). Estrategias de intervención para la inclusión. San Juan, PR: Isla Negra.

White House Task Force on Childhood Obesity. (2010, May). Solving the problem of childhood obesity within a generation, Report to the President. Retrieved from http://www.letsmove.gov/sites/letsmove.gov/files/TaskForce_on_Childhood_Obesity_May2010_FullReport.pdf.

SCHEDULE NUTR 4042

Mondays and Wednesdays 3:00 pm- 5:20 p.m. room EFAN-105

NOTE: The scheduled dates and topics are subject to change by the professor. When a change is made, notification will be given in class or by e-mail.

Text: Gropper, S. S. & Smith, J. L. (2018). Advanced nutrition and human metabolism (7th ed.). Belmont, CA: Wadsworth, Cengage Learning

Date (2017)	Topic	Chapter	Comments
3/12	Course Introduction, Discussion of Syllabus		
3/14	Problems of nutrition and health in Puerto Rico	Supporting materials	
3/19	Cells, organelles, and differential functions	1	
3/21	Cells, organelles, and differential functions	1	
3/26	Dietary and Physical Activity Guidelines	supporting materials	
3/28	Digestive system and hormonal control	2	
4/2	Digestive system and hormonal control	2	
4/4	Body composition models and methods	8	
4/9	Energy intake, energy expenditure, and energy balance; hormonal control Dietary and body carbohydrates	8 3	**REVIEW ARTICLE AND PAPER GUIDELINES GIVEN**
4/11	Dietary and body carbohydrates	3.4	
4/16	**EXAM 1**	1.2.8, supproting materials	
4/18	Dietary and body carbohydrates, hormones, dietary fiber, chromium; Integrated metabolism – diabetes	3,4	
4/23	Dietary and body carbohydrates, hormones, dietary fiber, chromium; Integrated metabolism –sweeteners	3,4	
4/25	Dietary and body protein, myocyte, exercise biochemistry, hormones; Integrated metabolism – sports	6	
4/30	Dietary and body protein, myocyte, exercise biochemistry, hormones; Integrated metabolism – stress	6	**TURN IN - PAPER REFERENCES AND OUTLINE**
5/2	Dietary and body lipids, adipocyte, cytokines and hormones – heart health; Integrated metabolism – starvation	5	
5/7	Dietary and body lipids, adipocyte, cytokines and hormones – heart health; Integrated metabolism – starvation	5	
5/9	Antioxidants in health and disease – vitamins C, E, selenium, zinc, copper, manganese, carotenoids, flavonoids	9-11	

	Coenzymes in macronutrient metabolism and bioenergetic pathways – B vitamins, magnesium		
5/14	**EXAM 2**	3-6	
5/16	Hematopoiesis, erythroblast – iron, vitamin B12, folate, vitamin B6, vitamin C; anemias	9-11	
5/21	Fluid and electrolyte balance – water, sodium, potassium, chloride, hormones, hypertension – heart health	13-14	**TURN IN REVIEW PAPER**
5/23	Bone health – calcium, phosphorus, magnesium, vitamin D endocrine system, vitamin K Eye health – vitamin A, carotenoids	9-11	
5/28	**Presentations (review paper) 10mins/students**		
5/30	**Catch up**		**Cert. 78-15 SA**
6/4	**EXAM 3**		
6/7-6/14	Final Exam Week-		TBA
Contact: nancy.correa@upr.edu**, visit office hours or call 787-764-0000 ext. 88581 if you have questions**			