

COURSE SYLLABUS

(1) GENERAL

SCHOOL	HEALTH SCIENCES MANAGEMENT AND ECONOMICS SCIENCES		
DEPARTMENT	SOCIAL WORK NUTRITION AND DIETETICS SCIENCES BUSINESS ADMINISTRATION AND TOURISM		
LEVEL OF STUDY	Graduate/Master's		
COURSE CODE	CDDA-B14	SEMESTER	B
COURSE TITLE	Nutrition, Food and Metabolism		
INDEPENDENT TEACHING ACTIVITIES	TEACHING HOURS WEEKLY	CREDIT UNITS (ECTS)	
Lectures	3	7.5	
COURSE TYPE	Special background Free choice course - optional compulsory		
PREREQUISITE COURSES:	No		
LANGUAGE OF TEACHING and EXAMINATIONS:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://eclass.hmu.gr/courses/SW355/		

(2) LEARNING OUTCOMES

Learning Outcomes

The purpose of the course is to make students understand the relationship between nutritional requirements, the composition of the diet (food), digestion and the mechanisms of metabolism in humans. The goal is for students, based on existing systematic documentation, to be able to develop options and interventions to optimize nutrition in health and disease states, ensure health and prevent common negative effects such as obesity and diabetes.

The course is offered at the postgraduate level and the learning outcomes correspond to level 7 of the European Qualifications Framework for Lifelong Learning (EQF). Based on the above, after the successful completion of the course, students are expected to:

Knowledge:

1. understand changes in nutrient stores and the relationship between dietary intake and utilization.
2. recognize that the genome determines nutritional requirements and metabolism.
3. understand energy transfer mechanisms and the concept of energy metabolism.
4. know the oxidation process of macronutrients and their storage potential.
5. describe the importance of protein synthesis and inter-organ metabolism of amino acids.
6. understand the critical nutrients for prenatal development and the importance of nutrition during pregnancy.
7. be aware of changes in body composition during growth and aging.
8. understand the effect of glucose, amino acids and fatty acids on the brain.
9. learn about the sensory systems that affect the perception and enjoyment of food.
10. describe the control mechanisms of food intake and energy homeostasis.
11. understand the causes and effects of obesity worldwide.
12. evaluate the effects of chronic energy deficiency (malnutrition) on the body.
13. know phytochemical compounds and their effects on chronic diseases such as cardiovascular disease and cancer.

Skills:

1. develop the ability to trace and analyse the flow of nutrients in the body.
2. assess the effect of genes on the regulation of metabolism and nutritional requirements.
3. analyse the synthesis and use of energy in aerobic and anaerobic conditions.
4. Recognize the interactions between macronutrients and hormones.
5. evaluate the flux of amino acids and their role in gluconeogenesis and acid-base balance.
6. assess nutritional needs during pregnancy and breastfeeding.
7. recognize the nutritional changes associated with growth and aging.
8. analyse the effect of dietary components on brain function.
9. appreciate the role of the sensory systems in the perception and acceptance of food.
10. analyse the physiological and hedonic motivations that influence food intake.
11. assess the relationship between energy intake and consumption that leads to obesity.
12. evaluate the organism's adaptation to conditions of malnutrition.
13. analyse the effect of phytochemical compounds in reducing chronic diseases.

Abilities:

1. be able to adapt the diet to different states of health and disease.
2. apply understanding of gene interactions to nutrition for disease prevention.
3. manage energy balance through diet and physical activity.
4. use the knowledge about the regulation of metabolism in the daily nutritional practice.
5. use the knowledge to manage proteins and amino acids in different phases of development.
6. Formulate appropriate strategies to meet nutritional needs during pregnancy and breastfeeding.
7. adjust nutrition according to life changes, from growth to aging.
8. recognize the brain's needs for nutrients and adjust the diet accordingly.
9. apply knowledge to improve nutritional status based on sensory preferences.
10. design strategies to manage food intake and obesity.
11. take preventive measures for obesity through proper nutrition.
12. manage the nutrition of people with chronic malnutrition.
13. take advantage of phytochemical compounds to improve health.

General Skills

The course aims to provide students with the following general skills:

- Independent work
- Demonstration of social, professional and ethical responsibility and sensitivity
- Work in an interdisciplinary environment
- Decision making
- Promotion of free creative and inductive thinkin

(3) COURSE CONTENT

The course includes the following sections:

- Basic concepts of nutrition
- Molecular dimension of nutrition
- The completion of metabolism: Energy
- Assimilation of metabolism: macronutrients
- Assimilation of metabolism: proteins and amino acids
- Pregnancy and breastfeeding
- Development and aging
- Nutrition and the brain
- Sensory systems and palatability acceptance/enjoyment of food
- The control of food intake

- Overeating
- Malnutrition
- Phytochemical compounds

(4) TEACHING and LEARNING METHODS - EVALUATION

METHOD OF DELIVERY	The teaching of the course includes: <ul style="list-style-type: none"> • Mainly on vivo and potentially distance learning supportive lectures. • Presentation of cases and their critical commentary. • Tutorial level exercises. 	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Presentation of PowerPoint slides and videos. Use of the e-class electronic platform to access slides/scientific articles. Frequent communication with students through the same platform and through the teachers.hmu.gr for responding to questions related to the educational process.	
TEACHING ORGANIZATION	Activity	Semester Workload
	Lectures, Seminars, skills teaching, and Interactive teaching	39
	Study and analysis of articles - bibliography - Independent Study	151
	Total Course	190
STUDENT EVALUATION	The course has one (1) form of assessment: Final written exams of multiple choice and brief responses to the questions during the exam period (100% of the final grade). All graded papers are accessible to students Evaluation language: Greek	

(5) RECOMMENDED-BIBLIOGRAPHY

- Suggested Bibliography:

- Andersen CH et al. Low physical activity accentuates the effect of the FTO rs993960 polymorphism on body fat accumulation, *Diabetes*, 2008; 57: 95-101.
- Blundell JE A psychological systems approach to appetite and weight control. In: *Eating Disorders and Obesity: A Comprehensive Textbook*, (Fairburn CG, Brownell KD eds), New York: Guilford Press, 2002: pp. 43-49.
- Boss O., Muzzin P., Giacobino JP The uncoupling proteins: a review, *Eur J Endocrinol*, 1998; 139: 1-9.
- Brosnan JT, Brosnan ME Creatine: endogenous metabolite dietary and therapeutic supplement, *Annu Rev Nutr*, 2007; 27: 241-241.
- Chun OK, Chung SJ, Song WO Estimated dietary flavonoid intake and major food sources of US adults, *J Nutr*, 2007; 137(5): 1244-1252.
- Collins S. Using middle upper arm circumference to assess severe adult malnutrition during famine, *JAMA*, 1996; 276: 391-395.
- Committee on Nutrition Services for Medicare Beneficiaries, Food and Nutrition Board. *The Role of Nutrition in Maintaining Health in the Nation's Elderly: Evaluating Coverage of Nutrition Services for the Medicare Population*, Washington DC: National Academy Press, 2000.
- Commonwealth Department of Health and Aging Australia Ministry of Health New Zealand National Health and Medical Research Council. *Nutrient Reference Values for Australia and New Zealand including Recommended Dietary Intakes*, Canberra: Commonwealth of Australia and New Zealand Government, 2006.
- D'Archivio M. et al. Polyphenols: dietary sources and bioavailability, *Ann Ist Super Sanita*, 2007; 43(4): 384-361.

- De Castro JM Genes, the environment and the control of food intake, *Br J Nutr*, 2004; 92 (Suppl 1): S59-S62.
- De Duve CR *Vital Dust: Life as a Cosmic Imperative*, Glasgow: Harper Collins, 1995.
- Ello-Martin JA, Ledikwe JH, Rolls BJ The influence of food portion size and energy density on energy intake: implications for weight management, *Am J Clin Nutr*, 2005; 82 (suppl. 2): 236S-241S.
- Erdman JW Jr et al. Flavonoids and heart health: Proceedings of the ILSI North America Flavonoids Workshop May 31-June 1 2005, Washington DC, *J Nutr*, 2007; 137(3): 718S-737S.
- FAO Food and Nutrition Technical Report Series 1. Human energy requirements. Report of a Joint FAO/WHO/UNU Expert Consultation. Rome: United Nations University, World Health Organization, Food and Agricultural Organization of the United Nations, 2004.
- Frayn K.N. *Metabolic Regulation: A Human Perspective*, 2nd ed., Oxford: Blackwell Publishing, 2003.
- Golla JA, Larson LA, Anderson CF, Lucas AR, Wilson WR, Tomasi TB An immunological assessment of patients with anorexia nervosa, *Am J Clin Nutr*, 1981; 34: 2756-2762.
- Hanash SM Operomics: molecular analysis of tissues from DNA to RNA to protein, *Clin Chem Lab Med*, 2000; 38: 805-813.
- Hirschi KD, Kreps JA, Hirschi KK Molecular approaches to studying nutrient metabolism and function: an array of possibilities, *J Nutr*, 2001; 131: 1605S-1609S.
- Holst B., Williamson G. Nutrients and phytochemicals: from bioavailability to bioefficiency beyond antioxidants, **Curr Opin Biotechnol*
- Hughes S. et al. Dendritic cell anergy results from endotoxemia in severe malnutrition, *J Immunol*, 2009; 183: 2818-2826.
- Hughes S., Kelly P. Interactions of malnutrition and immune impairment with special reference to immunity against parasites, *Parasite Immunol*, 2006; 28: 577-588.
- James WPT, Ferro-Luzzi A., Waterlow JC Definition of chronic energy deficiency in adults. Report of a working party of the International Dietary Energy Consultative Group, *Eur J Clin Nutr*, 1988; 42: 969-981.
- Joint FAO/WHO Expert Consultation on Human Vitamin and Mineral Requirements. Vitamin and Mineral Requirements in Human Nutrition, Rome: World Health Organization and Food and Agricultural Organization of the United Nations, 2004.
- Lecker SH, Goldberg AL, Mitch WE Protein degradation by the ubiquitin-proteasome pathway in normal and disease states, *J Am Soc Nephrol*, 2006; 17: 1807-1819.
- Levine JA Nonexercise activity thermogenesis – liberating the life-force, *J Int Med*, 2007; 262: 273-287.
- Libao-Mercando AJ et al. Dietary and endogenous amino acids are the main contributors to microbial protein in the upper gut of normally nourished pigs, *J Nutr*, 2009; 139: 1088-1094.
- Murray RK, Granner DK, Mayes PA, Rodwell VW *Harper's Illustrated Biochemistry*, 27th ed., New York: Lange Medical Books/McGraw-Hill, 2006.
- National Health and Medical Research Council of Australia. Nutrient Wheeler TT, Hodgkinson AJ, Prosser CG, Davis SR Immune components of colostrum and milk – a historical perspective, *J Mamm Gland Biol Neoplasia*, 2007; 12: 237-47.
- National Health and Medical Research Council. Dietary guidelines for children and adolescents in Australia incorporating the infant feeding guidelines for health workers, Canberra: Australian Government Publishing Service, 2003.
- Rampersaud E. et al. Physical activity and the association of common FTO gene variants with body mass index and obesity, *Arch Int Med*, 2008; 168(16): 1791-1797.
- Ravussin E. et al. Reduced rate of energy expenditure as a risk factor for body-weight gain, *New Eng J Med*, 1988; February 25; 318(8): 467-472.
- Salway JG *Metabolism at a Glance*, 3rd edition, Oxford: Blackwell Publishing, 2004.
- Savage JS, Fisher JO, Birch LL Parental influence on eating behavior: conception to adolescence, *J Law Med Ethics*, 2007; 35: 22-34.
- Sclafani A. Oral and postoral determinants of food reward, *Physiol Behav*, 2004; 81: 773-779.
- Shaw RJ mTOR signaling: RAG GTPases transmit the amino acid signal, *Trends in Biochem Sci*, 2008; 33: 565-568.
- Soneberg N., Hinnebusch AG Regulation of translation initiation in eukaryotes: mechanisms and biological targets, *Cell*, 2009; 136: 731-745.

- *Stock MJ Gluttony and thermogenesis revisited, Int J Obes Relat Metab Disord, 1999; 23(11): 1105-1117.*
- *Summerbell CD et al. The association between diet and physical activity and subsequent excess weight gain and obesity assessed at 5 years of age or older: a systematic review of the epidemiological evidence, Int J Obes, 2009; 33: S1-S88.*
- *US Department of Health and Human Services and US Department of Agriculture. Dietary guidelines for Americans, 2005. On-line scientific background papers for each guideline. <http://www.healthierus.gov/dietaryguidelines>.*
- *US Department of Health Services. MyPyramid.gov, 2005. On-line scientific background papers for each guideline. <http://www.mypyramid.gov/>.*
- *World Health Organisation. The WHO child growth standards, 2006. On-line scientific background papers for each guideline. <http://www.who.int/childgrowth/standards/en/>.*
- *Yeomans MR, Blundell JE, Leshem M. Palatability: response to nutritional need or need-free stimulation of appetite?, Br J Nutr, 2004; 92 (suppl. 1): S3-S14.*

-Related scientific journals:

- Appetite
- British Journal of Nutrition
- Clinical Nutrition
- Food & Function
- Journal of Human Nutrition and Dietetics
- Journal of Nutritional Biochemistry
- Journal of the Academy of Nutrition and Dietetics
- Metabolism: Clinical and Experimental
- Molecular Nutrition & Food Research
- Nutrients
- Nutrition & Metabolism
- Nutrition Research
- Obesity
- The American Journal of Clinical Nutrition
- The European Journal of Clinical Nutrition
- The Journal of Nutrition