COURSE OF STUDY *Master degree: Food Science and Technology (LM70)*

ACADEMIC YEAR *2023-2024*

ACADEMIC SUBJECT *Human Nutrition (3 ECTS) - I.C. Foods and applied nutrition (9 ECTS)*

General information	
Year of the course	*Second*
Academic calendar (starting and ending date)	*I semester (25/09/2023-19/01/2024)*
Credits (CFU/ETCS):	3
SSD	*BIO/09*
Language	*Italian*
Mode of attendance	*No Compulsory*

Professor/ Lecturer	
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Department and address	*DBBA – University of Bari*
Virtual room	*Microsoft Teams*
Office Hours (and modalities: e.g., by appointment, on line, etc.)	*Monday to Friday by appointment only.*

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
75	*16*	*14*	*48*
CFU/ETCS			
3	*2*	*1*	

Learning Objectives	The course aims to provide in-depth knowledge regarding the physiology of human nutrition with reference to the guidelines of healthy eating, paying particular attention to: energy balance, basal metabolism, energy needs; diet-induced thermogenesis, BMI and food intake regulation, nutritional role of different food groups, functional role of foods. Furthermore, knowledge will be provided regarding food intolerances and allergies and nutrition in particular physiological conditions: first year of life, children and adolescents, old age, pregnancy and breastfeeding, sport.
Course prerequisites	Knowledge of human anatomy, general, inorganic and organic chemistry. Knowledge of food constituents. Basic cell biology and physiology knowledge.

Teaching strategies	Lectures will be presented through PC assisted tools (PowerPoint) and slide projector. Lecture notes and educational supplies will be provided by means of online platforms (i.e.: Teams, Google Drive etc.)
Expected learning outcomes in terms of	
Knowledge and understanding	*Knowledge and understanding*

on:	o Knowledge of the principles of human nutrition and the digestive system in its features and functions *Applying knowledge and understanding* o Ability to assess food consumption and nutritional errors o Capacity to evaluate human nutritional requirements o Ability to assess the relationship between nutrition and health o Ability to evaluate the relationships between food behavior and marketing *Making informed judgements and choices* o The ability to correctly orientate the search for suitable solutions to change the food style o The ability to correctly orient the choice of food based on quality and health issues (celiac disease, intolerance and c.) *Communicating knowledge and understanding* o Ability to describe the characteristics and functions of the various organs of the gastrointestinal tract in digestion and absorption o Ability to describe the various biological causes underlying a food pathology o Ability to describe the catabolic, anabolic and functional role of macro and micronutrients *Capacities to continue learning* o Ability to deepen and update their knowledge of nutrition and nutrition
Soft skills	• Making informed judgments and choices: o Ability to manage the selection process of microbial starters according to the process and product variables. o Ability to develop and apply models and to predict the growth of microorganisms in certain environmental conditions. o Ability to provide a critical interpretation of the results of microbiological analyses on food, aimed at the prediction of microbial growth, the evaluation of the effects of sanitization treatments (thermal and non-thermal), the evaluation of the commercial shelf-life of foods and food safety. • Communicating knowledge and understanding: o Ability to communicate the acquired theoretical concepts in oral and written form, using appropriately the scientific language and the specific lexicon of predictive microbiology. o Ability to describe, also through applicative cases, the practical aspects and potential effects of this discipline on the research and development and quality control activities in food industry. • Capacities to continue learning: o Ability to deepen and update knowledge regarding the application of starter microorganisms in the food industry, and the criteria for their selection. o Ability to deepen and update knowledge regarding mathematical modelling techniques and predictive microbiology applied to the food industry.
Syllabus	
Content knowledge	<u>Alimentation and Nutrition</u>: characteristics and roles in the various stages of life. Energy, entropy and homeostasis. Cellular and molecular turnover. Nutrient availability and energy storage. Anthropological relationship between man and food. Sensory perception of taste and smell. The role of learning and memory in the conditioning of feeding behaviour and influence on marketing. <u>Nutrients</u>: Recalls on: Biomolecules and their catabolic, anabolic and functional

characteristics; Relations with the biomolecular composition of the human body; Bioavailability, essentiality, biological and chemical nutrient value. Functional foods and nutraceuticals. Nutrigenomics.

Physiology of gastro-intestinal system. Functions of the digestive system. Relationships between chemical characteristics of foods and nutrients and structural and functional peculiarities of the gut organs in digestion, absorption and distribution of nutrients. Characteristics and roles of the intestinal microbiota.

Omeostasis and alimentary behaviour and its regulation: Recalls on: Long- and shor-term controls; Hypothalamic nuclei; Neuroendocrine control; Alteration of alimentary behaviour.

Energetic and dietetic: Expenditure and energy needs. Basal metabolic rate and energy. Body mass index. Body constitution and relationships with energy requirements. Calorimetric and analytical evaluation of energy needs. Caloric food content and quantitative ratio of energetic nutrients in the diet. Level of recommended dietary allowance (RDA): meaning, quality and quantity. Relationships between diet, body weight, body composition and healthiness.

Adverse reaction to food: Intoxication (DL50, NOEL, RML) Toxins (bacterial, animal, vegetal, atrophic). Alimentary allergy (milk, eggs, etc.) Alimentary intolerance (lactose, fructose, gluten, phenylalanine, favismus). Guidelines about diagnosis of food allergies and intolerances.

Texts and readings	• Notes from lectures and educational materials distributed during the course • "Alimentazione, Nutrizione e Salute" Debellis, Poli – Editrice EdiSES • "FISIOLOGIA dalle molecole ai sistemi integrati" Carbone, Cicirata, Aicardi - Editrice EdiSES • "Nutrizione Clinica" Magnati, Russo Dazzi - Editrice EdiSES • "Fondamenti di Scienze dell'Alimentazione" La Guardia, Giammanco S, Giammanco M - Editrice EdiSES
Notes, additional materials	
Repository	All teaching material will be available to students on web platforms (class Teams code).

Assessment	
Assessment methods	The exam consists of an oral dissertation on the topics developed during the theoretical and theoretical-practical lectures in the classroom and in practical activities (laboratory and educational visits). Students may have a middle-term preliminary exam, consisting of a written test, relative to the first part of the program, which will concur to the final evaluation and will be considered valid for one academic year (Art. 4 of the Didactic Regulations of the Master's Degree Course in Food Science and Technology). The result of the mid-term exam is communicated by publication in the student's electronic register and contributes to the assessment of the profit examination by means of calculation of the weighted average. The exam for foreign students may be conducted in English as described above.
Assessment criteria	*Knowledge and understanding skills* • Describe the principles of human nutrition and the digestive system in its features and functions presented in lesson *Knowledge and understanding skills applied* • Evaluate food consumption and nutritional errors

	• Evaluate human nutritional requirements • Describe the relationship between nutrition and health • Describe the relationship between eating behavior and marketing as presented during the course *Making informed judgements and choices* • Make reasonable assumptions to change the style of food and the choice of food *Communicating knowledge and understanding* • Describe the characteristics and functions of the various organs of the gastrointestinal tract in digestion and absorption • Describe the various biological causes underlying a food pathology • Describe the catabolic, anabolic and functional role of macro and micronutrients *Capacities to continue learning* o Ability to learn or to hypothesize a possible approach to assessing daily needs and energy input in a diet presented as a case study
Final exam and grading criteria	The assessment of the student's preparation is based on predetermined criteria in accordance with the Didactic Regulations of the Master's Degree Course in Food Science and Technology (art. 4). The Examination Committee has a score ranging from a minimum of 18 to a maximum of 30 points for a positive assessment of the student's performance. By unanimous vote of its members, the Board may award honours in cases where the final mark is 30.
Further information	
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