

<b>Academic subject:</b> Biochemistry of food and food supplements			
<b>Degree Class:</b> LM-7		<b>Degree Course:</b> Biotechnologies for the quality and the healthiness of nutrition	
		<b>Academic Year:</b> 2020/2021	
		<b>Kind of class:</b> Mandatory	
		<b>Year:</b> First	<b>Period:</b> First
		<b>ECTS:</b> 6 divided into <b>ECTS lessons:</b> 5 <b>ECTS exe/lab/tutor:</b> 1	
<b>Time management, hours, in-class study hours, out-of-class study hours</b> lesson: 40 hours    exe/lab/tutor: 12 hours    in-class study:    out-of-class study: 98 hours			
<b>Language:</b> Italian		<b>Compulsory Attendance:</b> yes	
<b>Subject Teacher:</b> Angela Maria Serena Lezza		<b>Tel:</b> 080-5443309 <b>e-mail:</b> angelamariaserena.lezza@uniba.it	
		<b>Office:</b> Department of Biotechnologies, Biosciences and Biopharmaceutics – Building of Biological Departments - Campus  Room n.42    Floor 1	
		<b>Office days and hours:</b> Thursday 15.30-17.30, by Microsoft Teams platform	
<b>Prerequisites:</b> Basic knowledge of biochemistry and physiology			
<b>Educational objectives:</b> Deep knowledge of biochemistry of nutrition including: chemical composition and digestive/metabolic utilization of foods, specific need of different nutrients, metabolic alterations/ pathologies due to genetic origin or incorrect nutrition, evaluation of adequacy of dietary regimens applied to particular situations, evaluation of possible introduction of specific food supplements for the maintenance of an individual healthy state.			
<b>Expected learning outcomes (according to Dublin Descriptors)</b>		<p><b>Knowledge and understanding:</b> To provide a deep knowledge of the biochemical principles of nutrition including: chemical composition of foods and their digestive/metabolic utilization, specific need of different nutrients and metabolic alterations/ pathologies due to genetic origin or incorrect nutrition.</p> <p><b>Applying knowledge and understanding:</b> Capability to evaluate the adequacy of dietary regimens applied to specific situations. Capability to evaluate the content of specific nutrients in foods and to relate it to the requirements of specific cases.</p> <p><b>Making judgements:</b> Capability to evaluate the possibility to introduce alternative foods and/or food supplements for the maintenance of an individual healthy state and for the prevention or the supplementary treatment of metabolic alterations/pathologies already appeared.</p> <p><b>Communication:</b> Ability to adequately use instruments for written and oral communication in Italian and English languages and to elaborate presentations for the dissemination of data from scientific literature and experimental results.</p> <p><b>Lifelong learning skills:</b> Capability to deepen the relevance of nutrition for the maintenance of an individual healthy state and for the prevention/management of metabolic alterations and/or pathologies by reading published sources in printed or electronic formats and by participation to seminars or thematic conferences.</p>	
<b>Course program:</b> Nutritional bioelements: glycid, classification, energy and structural functions; glycidic absorption and metabolism; glucose homeostasis. Lipids, classification, energy and structural functions; fatty acids, cholesterol, phospholipids, lipoproteins; lipid absorption and metabolism; lipid minimum. Protides, classification; metabolic, energy and structural functions; calculation of protein minimum; biological value and digestibility of proteins; consequences of protein excess or deficiency. Phases and effects of fasting. Water-soluble and fat-soluble			

vitamins: functions, recommended daily allowances. Inorganic elements: water and mineral salts (Ca, P, Mg, Na, K, Cl, Fe, Cu, Zn, Se, I, Cr), functions, recommended daily allowances, content in foods, metabolism. Biochemical effects of alcoholic beverages consumption.

Food supplements and dietetic products: creatine, glutamine, carnitine, saline supplements. Foods and technologies: novel food products. Biological, wholemeal, "light", fortified, functional and innovative foods. Role of antioxidants in nutrition. Free radical species, oxidative stress, toxicity of free radicals (interactions with proteins, lipids and nucleic acids). Mechanisms of defense against free radicals: enzymatic (superoxide dismutase, glutathione peroxidase, glutathione reductase, catalase, glucose-6-phosphate dehydrogenase) and non-enzymatic (vitamin C, vitamin E, carotenoids, bioflavonoids, glutathione, ceruloplasmin, selenium).

Nutrition and health: molecular bases of pathologies associated to incorrect eating habits. Food allergies and intolerances. Diet with calorie restriction and longevity. Biochemical analysis of some kinds of diets.

**Teaching methods:** The teaching material for the subjects treated in the classes will be made available by the teacher.

**Auxiliary teaching:**

**Assessment methods:** Oral examination.

**Bibliography:** Personal notes taken at classes and laboratory sessions.

Le basi molecolari della nutrizione by G. Arienti – Piccin Editore

Biochimica per le discipline biomediche by J.W. Baynes e M.H.Dominiczak – Elsevier Ed.

I principi di biochimica di Lehninger by D.L. Nelson e M.M. Cox – Zanichelli Ed.