

Syllabus

Course description

Course title	Food chemistry
Course code	44705
Scientific sector	CHIM/10
Degree	Food Sciences for Innovation and Authenticity
Semester	II
Year	I
Academic year	2018/19
Credits	6
Modular	No

Total lecturing hours	36
Total lab hours	24
Total exercise hours	
Attendance	Yes
Prerequisites	
Course page	

Specific educational objectives	<p>Aims</p> <p>The course discusses the basic principle of food chemistry. The chemistry of carbohydrates, lipids, proteins, and other constituents in fresh and processed foods are discussed and related to their effect on food quality. The course will offer also a deep understanding of the analysis of foods. Students take an active role in learning course content (presented via Power Point presentations), which is available to class participants on the Food Chemistry web site, as well as laboratory activities. These include the chemical analysis of fruits and vegetables; milk and dairy products, oils and wine.</p> <p>Educational objectives:</p> <ol style="list-style-type: none"> 1) the student is able to describe the theory of reaction kinetic and what is behind the main reactions discussed during the course. 2) given a set of kinetic models, the student is able to comprehend the type of reaction, the rate constant, the reaction order, the rate of change and the main variables. 3) given the description of a specific storage or processing situation, the student is able to identify the most important reactions that may occur, describing the theory governing those reactions and identifying the key element to control them. 4) given a set of experimental data, the student is able to derive the best kinetic model, analyze the
--	---

	situation, describe the appropriate procedure to report the solution to the problem, predict the changes occurring to foods.
--	--

Lecturer	Prof. Saverio Mannino
Scientific sector of the lecturer	AGR/15
Teaching language	English
Office hours	32
Teaching assistant (if any)	Do be recruited
Office hours	16
List of topics covered	<p>Introduction to the Course</p> <p>Sugars in food Monosaccharides, Oligosaccharides, Special Topics (Reducing Group Reactions, Acrylamide, The Maillard Reaction), Polysaccharides, Starch, Pectins, Cellulose, Hemicelluloses and Fibre Gums, Special Topics (Chemically Modified Starches, Syrups from Starch, Analysis.</p> <p>Lipids in food Fatty Acids: Structure and Distribution, Essential Fatty Acids, Reactions of Unsaturated Fatty Acids, Hydrogenation, Margarine and trans Fatty Acids, Rancidity, acidity, peroxides, Antioxidants, Sterols, Fractionation and Interesterification, Polar Lipids , Milk Fat, Cream and Butter, Analysis.</p> <p>Proteins in food Amino Acids, Protein Structure, Essential Amino Acids and Protein Quality, Meat, Milk, Cheese and eggs, Analysis.</p> <p>Special topics Colorants, Additives.</p>
Teaching format	Frontal lectures, exercises, labs, projects

Learning outcomes	<p>The learning outcomes are:</p> <p>Knowledge and understanding Students are expected to understand and be able to control the major chemical and biochemical (enzymatic) reactions that influence food quality with emphasis on food industry applications. To understand how the properties of different food components and interactions among these components modulate the specific quality attributes of food systems, and to understand the principles that underlies the biochemical/enzymatic techniques used in food analysis.</p> <p>Applying knowledge and understanding</p>
--------------------------	--

	<p>The student will be able to apply the theoretical knowledge of on the chemical changes occurring to foods.</p> <p>Making judgements The student will be able to analyze and compare the chemical properties of foods and their effect on its quality.</p> <p>Communication skills Communication skills will be evaluated in class through the discussion of case studies and in the lab through the evaluation of the laboratory activity.</p> <p>Learning skills The student will learn practical laboratory methods to analysis the chemical properties of foods.</p>
Assessment	The oral assessment is based on a written project report. The exam is based on review questions, oral exam to test knowledge application skills and the evaluation of results
Assessment language	English
Evaluation criteria and criteria for awarding marks	<p>The evaluation consists of:</p> <ul style="list-style-type: none"> oral exams (100%) <p>Criteria for the oral examination:</p> <ul style="list-style-type: none"> Knowledge of the main chemical properties of foods Understanding of the effect of chemical properties on the resulting food quality. Ability to communicate in a concise and precise way.
Required readings	<p>Slide and spreadsheets discussed during the lecture.</p> <p>Saverio Mannino, <i>Esercitazioni di analisi chimica dei prodotti alimentari. Esperimenti pratici di laboratorio</i>, Tecnos, ISBN: 8885255523</p>
Supplementary readings	H. D. Belitz, Foods chemistry, Springer, Doi: 10.1007/978-3-540-69934-7.