DIPARTIMENTO DI SCIENZE

COURSE: **CHEMISTRY OF THE FOODS**			
ACADEMIC YEAR: **2019-2020**			
TYPE OF EDUCATIONAL ACTIVITY: **Free Choice**			
TEACHER: **Prof. Mauro De Nisco**			
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phone: **0971205039**		mobile (optional):	
Language: **ITALIAN**			
ECTS: **6**	n. of hours: **48**	Campus: **Potenza** Dept./School: **Dipartimento di Scienze** Program: **Pharmacy (LM-13)**	Semester: **from October 1, 2019 to December 17, 2019 – from January 13, 2020 to January 21, 2020**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The goal of food chemistry course is to provide a thorough knowledge of the constituents of food chemistry and the basic principles of food quality.

Knowledge and understanding:

The student must demonstrate to possess the basic knowledge of organic chemistry, paying specific attention to biomolecules, to be able to: a) understand the structural characteristics of the organic components of food; b) to analyze the transformation of food; c) understand the function of food additives; d) Know the components of the foods responsible for the organoleptic characteristics.

Ability to apply knowledge and competence:

The student must demonstrate knowledge of applying the acquired information in the evaluation of the nutritional implications of food transformation/alteration processes; the presentation of the topics is aimed at favoring the development of the ability to autonomously examine a) the effects of the structural variations of the main components on the macroscopic properties of the food matrices and b) the effectiveness and applicability in different cases of the strategies.

Learning skills:

The student must a) develop the ability to understand independently a text or a scientific work also in English that deals with topics related to food, their composition, transformation and conservation; b) be able to update or expand their knowledge also drawing from non-scientific literature or other sources and evaluate information with a critical sense; c) gradually acquire the ability to follow specialist seminars, conferences, masters etc. in the food and nutrition sectors; d) understand the needs of companies in terms of knowledge, skills and abilities and possible areas of application.

Communication and judgements skill:

The student must demonstrate a) to be able to clearly illustrate, by appropriately exemplifying them, the characteristics of common foods in terms of the main constituents and the peculiar components that determine their organoleptic characteristics; b) to have understood and be able to explain the aims of the main strategies used to preserve food; c) to be able to explain the transformation of foods following common breeding practices in a simple but correct way.

The student must be able to: a) propose effective methods compatible with food safety to preserve the fundamental components of food; b) knowing how to draw information from non-scientific literature or other sources; c) be able to identify any additives in the description of the composition of industrial

products and understand their function; c) deepen and update the basic knowledge provided during the course.

PRE-REQUIREMENTS

SYLLABUS

Lipids: General information and chemical classification. Saturated fatty acids, mono and polyunsaturated; configuration of double bonds; melting points, fatty acid composition of oils and greases, essential fatty acids. Reactions of unsaturated fatty acids: hydrogenation, oxidation. Lipid peroxidation, hydroperoxides. Mechanisms of formation of Acrolein, toxicity and metabolism. Polymerization processes.

Carbohydrates: General information and chemical classification. Reactions: oxidation of sugars, glucose enzymatic determination; reductions. Glycosides and glycosidic linkage. Oligosaccharides Non-enzymatic Browning processes: thermal processes; the Maillard reaction; hydroxymethylfurfural; Amadori compounds; maltol, isomaltol; melanoidins. Polysaccharides: classification; starch composition, structure and properties. Non-starch polysaccharides and dietary fibre.

Protein: General information and chemical classification. Protein composition of the most common foods; Denaturing processes; Essential amino acids and protein quality. Analysis of proteins in food; which quantitative analysis/amino acids; Lowry method, Kjedahl method. Protein foods; the milk: casein micelles structure; gluten proteins; bread leavening processes.

Organoleptic properties: Artificial and Natural dyes in food. Taste and smell.

TEACHING METHODS

Theoretical lessons

EVALUATION METHODS

Written examination and oral examination.
The written examination consists in 20 multiple-choice questions and 2 open questions.
The final evaluation will be expressed by a vote (30/30).

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- **Patrizia Cappelli & Vanna Vannucchi "Chimica degli Alimenti" terza edizione Zanichelli**
- **Paolo Cabras & Aldo Martelli "Chimica degli Alimenti" Piccin**
- **Tom P. Coultate "Chimica degli Alimenti" Zanichelli**
- **Lecture notes compiled by Teacher will be distributed as pdf files by e-mail**

INTERACTION WITH STUDENTS

Office Hours: Monday 4-6 pm and Tuesday 10-12 am; if these hours are not suitable e-mail for an appointment at an alternate time.

EXAMINATION SESSIONS (FORECAST)[1]

11-02-2020, 10-03-2020, 09-06-2020, 13-07-2020, 24-09-2020, 06-10-2020, 03-11-2020 15-12-2020

SEMINARS BY EXTERNAL EXPERTS YES □ NO **X**

FURTHER INFORMATION

[1]Subject to possible changes: check the web site of the Teacher or the Department/School for updates.