Degree Course in Human Nutrition Sciences

INTEGRATED TEACHING : **Analytical, pharmaceutical and food chemistry**

NUMBER OF CFU: **10**

SSD : **chim 10 Food chemistry/ chim 08 pharmaceutical chemistry**

RESPONSIBLE TEACHER :
Marco Marchetti
Go to: https://www.unicamillus.org/it/personnel/marchetti-marco/

E-MAIL: **marco.marchetti@unicamillus.org**

Teaching: **Food chemistry**

SSD Teaching: **Chim 10, Food Chemistry**

Number of credits: **5**

Teacher name: **Marco Marchetti**
e-mail: **marco.marchetti@unicamillus.org**

Teaching: **Pharmaceutical Chemistry**

SSD Teaching: **Chim 08, Pharmaceutical Chemistry**

Number of credits: **5**

Teacher name: **Marco Marchetti**
e-mail: **marco.marchetti@unicamillus.org**

FREQUENCY MODE :

Mixed mode : presence and e-learning for both modules

PREREQUISITES :

Knowledge of Organic Chemistry, Inorganic Chemistry, Analytical Chemistry, Biochemistry. For both modules

EDUCATIONAL OBJECTIVES

The objective of teaching food chemistry is to provide the student with adequate knowledge on the structure and properties of food constituents and on the mechanisms of the main transformation, processing, alteration and contamination reactions.
The main analytical techniques in food quality control and conservation will be analysed .
The educational aim of the Pharmaceutical Chemistry course is aimed at acquiring the fundamental basic principles of pharmacokinetics, pharmacodynamics, pharmacogenetics and the general characteristics of the most important classes of drugs with particular reference to active ingredients linked to nutrition.
Concepts such as drug, active ingredient, excipient will be analysed. The routes of administration, absorption, distribution. Adverse reactions, the phases of the trial. Particular attention will be paid to drugs that influence the mechanisms of intake, assimilation and excretion of nutrients. The student will also explore the influence of drugs on nutritional status and the interactions between foods and drugs

EXPECTED LEARNING OUTCOMES

At the end of the food chemistry course the student should have learned the classification of macro and micro nutrients, the main technological processes applicable to foods and the related contaminants, the main methods of preserving food and increasing the shelf life period.
The pharmaceutical chemistry course will allow the student to acquire adequate skills to be able to manage a patient undergoing therapy from a nutritional point of view and to be able to deal with the major problems related to possible interactions between drugs, food supplements/herbs and foods.

Knowledge and understanding

The notions learned at the end of the integrated course in analytical, pharmaceutical and food chemistry will allow the student to possess basic knowledge and notions for carrying out a future profession, both in the private sector and therefore in the drafting of nutritional regimes intended for the individual patient and/or family family, both in the public sector, therefore in the case of collective catering, quality systems , etc.

Ability to apply knowledge and understanding

The skills expected at the end of the integrated course are linked to the training received. The student is expected to possess and handle theoretical skills in terms of interaction, drug, nutrient, food preservation and processing methods, reading nutritional labels such as to make him eclectically competent in carrying out his future profession as a nutrition professional .

PLAN

FOOD CHEMISTRY PROGRAM

Food composition:
Macro and micro nutrients, fibre, calories.
The biological value.
Mechanisms of rancidity, hydrogenation, and retrogradation.

Foods:
Waterfall; milk and cheese; egg; meat; fish, crustaceans, molluscs; oils; cereals; legumes; vegetables; fruit; wine; honey; spices, coffee , tea, cocoa, salt.

Stability and food safety:
Storage, expiry date, food preservation techniques. Food additives.
Natural and synthetic preservatives. The dyes
Process contaminants. Intoxication, food poisoning and foodborne infection

Effects of foods on human health:
Novel food and super food. Junk food. Nutraceuticals and supplements.
Organic, biodynamic and GMO products.
The NACCP system

PHARMACEUTICAL CHEMISTRY PROGRAM

General Part

-Pharmacokinetics: routes of administration, absorption and distribution

-Pharmacodynamics: mechanism of action of drugs; receptors, metabolism, elimination of drugs

-Adverse and unwanted reactions: drug toxicity , drug-drug interactions, drug-food interactions. Allergies and idiosyncrasies. The concepts of abuse, tolerance and dependence. The therapeutic window.

-The development and testing of new drugs: preclinical testing; general principles of in vitro drug sensitivity tests ; phases of the clinical trial. Pharmacovigilance

-Food supplements

Active principles

-Antihyperlipemic drugs: acid sequestrants. bile, fibrates, Ezetimibe, HMG-CoA reductase inhibitors, etc.

-Drugs modulating absorption : lipase inhibitors, biguanides etc

-Drugs modulating the sense of hunger and satiety : sympathomimetic amines, serotonergics, etc

-Drugs modulating glucose absorption and excretion: Insulin, sulfonylureas, inhibitors. of SGLT2 etc.

-Drugs of natural origin: fibres, draining products, laxatives, etc

-Food supplements

-Prebiotics and probiotics

TEACHING METHOD

E-learning and frontal lessons for both modules

LEARNING VERIFICATION METHODS

The learning assessment takes place orally or written via multiple choice tests
The final grade will be expressed in thirtieths based on the weight of each individual teaching.

RECOMMENDED TEXTS AND BIBLIOGRAPHY

RECOMMENDED TEXTS AND FOOD CHEMISTRY BIBLIOGRAPHY

1. Slides and material shown during the lessons
2. Food chemistry: Cabras, Martelli; Piccin ed

RECOMMENDED TEXTS AND PHARMACEUTICAL CHEMISTRY BIBLIOGRAPHY

1. Slides and material shown during the lessons
2. Principles of Medicinal Chemistry, The Essentials , by Thomas L. Lemke (Author) S. William Zito. Piccin ed.