COURSE DATA

Data Subject	
Code	33949
Name	Toxicological Risk Evaluation
Cycle	Grade
ECTS Credits	4.5
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
1205 - Degree in Human Nutrition and Dietetics	Faculty of Pharmacy and Food Sciences	4	First term

Subject-matter

Degree	Subject-matter	Character
1205 - Degree in Human Nutrition and Dietetics	33 - Toxicological risk assessment	Optional

Coordination

Name	Department
FERRER GARCIA, EMILIA	265 - Prev. Medicine, Public Health, Food Sc.,Toxic. and For. Med.
FONT PEREZ, GUILLERMINA	265 - Prev. Medicine, Public Health, Food Sc.,Toxic. and For. Med.

SUMMARY

The Toxicological Risk Assessment (33 949) is an elective subject of four-year degree, Human Nutrition and Dietetics, in the Faculty of Pharmacy, University of Valencia. This subject has in the current curriculum a total of 4.5 ECTS credits taught during the first quarter.

The fundamental objective of this subject is to study the toxicological processes on organ systems and the methodologies for the risk assessment. Based in the toxic properties of an agent or mixtures and the conditions of human and environmental exposures, to identify the probability and severity of adverse effects to human and the environment. Also, in order to study the most relevant risk situations due to the presence of toxic substances in food.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

To study Toxicological Risk Assessment, the knowledge of a number of basic concepts of biology, chemistry and biochemistry are needed. These concepts are part of the contents of the subjects taught during the previous courses in the Degree in Human Nutrition and Dietetics.

OUTCOMES

1205 - Degree in Human Nutrition and Dietetics

- Keep a receptive attitude and understand the meaning of the knowledge transmitted.
- Know about forms of exposure to toxics.
- Know the different toxicokinetic and ecotoxicokinetic processes of toxic substances.
- Know the international protocols of toxicological tests to evaluate toxic effects.
- Design and evaluate toxicological tests.
- Be able to estimate the risks associated with exposure to chemicals and to toxics in consumer products, in the workplace and in the environment.
- Know the restrictions of use derived from the assessment of toxic effects.
- Be able to interpret the data obtained from the risk assessment and establish safety limits.
- Be able to interpret the establishment of safety margins.
- Know the methods most commonly used for risk assessment.
- Know and be able to use the basic sources of information and databases that are used for risk assessment.
- Ser capaz de establecer buenas relaciones con otros miembros del grupo y trabajar en equipo.
- Ser consciente de la importancia de su participación activa en el proceso de su propio desarrollo intelectual y científico.

LEARNING OUTCOMES

At this course, students should acquire the following abilities:

• Knowledge on basic toxicology. Knowledge of the forms of exposure to toxics. Knowledge of the different processes toxicokinetic and eco-toxicokinetic from the toxic substances.

• Ability to estimate the risks associated with the exposure to toxic at consumer products, at work and at the environment.

• Knowledge of use restrictions from the evaluation of toxic effects.

• Ability to establishment of safe limits and to interpret data from risk assessment.

- Knowledge of methods for risk assessment.

• Ability to manage the basic information sources and databases that are used for risk assessment.
• Ability to perform experimental work and to motivate students to continue the scientific and research activity.

DESCRIPTION OF CONTENTS

1. Risk Asessment Toxicology.

Risk assessment. Introduction. International organizations. Stages of risk assessment. Bibliography.
Hazard Identification. Physico-chemical properties of the toxic. Structure-activity relationships.
Exposure assessment. Risk Characterization.
Concept of Acceptable Daily Intake (ADI). Criteria for establishing the value of ADI.
Parameters in food toxicology. Uncertainty factors.
Threshold of Toxicological Concern (TTC) concept. History and evolution of the TTC. TTCs proposed according to the chemical structure. Validation TTC concept.

2. Toxicity assessment in organs and systems.

Toxicology of the nervous system. Toxic, foods and neurotoxic effects. Prevention.
Toxicology of the liver. Toxic, foods and hepatotoxic effects. Prevention.
Toxicology of the kidney. Toxic, foods and nephrotoxic effects. Prevention.
Toxicology of the digestive system.
Cardiovascular Toxicology.
Toxicology of the skin. Toxic effects.
Endocrine Toxicology.

3. Specific Risk Assessment.

Vitamin and mineral supplementation: risk assessment.
Medicinal plants.
Metals: Bioavailability and risk assessment.
Risk assessment of food additives and contaminants.
Toxicological aspects of colourings and sweeteners.
Assessment of risk from mycotoxins exposure.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Computer classroom practice	8,00	100
Seminars	2,00	100
Tutorials	2,00	100
Development of group work	5,00	0
Development of individual work	5,00	0
Study and independent work	10,00	0
Readings supplementary material	7,00	0
Preparation of evaluation activities	7,00	0
Preparing lectures	25,50	0
Preparation of practical classes and problem	4,00	0
Resolution of case studies	4,00	0
TOTAL	**109,50**	

TEACHING METHODOLOGY

The development of the course is structured as follows:

Lectures will include 2 hours each week in which the teacher provides an overview of the topic, and the information necessary to understand the contents of the subject. In these classes the students themselves are encouraged to conduct the search for accessory or additional information, guiding the use of bibliographical sources. The student is recommended to review the material previously available in the virtual classroom.

Specialized tutoring sessions in groups. Small groups of students will be organized to guide the students and determine the functioning of the course. This will be the ideal environment for students to raise the different issues that they arise throughout the development of the program.

Practical sessions in computer lab will be made in small groups and attendance is mandatory. The student's work will be followed step by step, to evaluate if they acquire the skills in finding information on websites and databases related to toxicology and to resolve practical cases. Students will expose the results and discuss their interpretation. At the end, students must give a report with the results.

Seminars / jobs. Small working groups will work on an issue raised by the teacher in order to expose the rest of the class and generate further debate. A script is given to the rest of the students prior to the speech. The group will be personally supervised by the teacher on a regular basis and guide the search of bibliographic sources and critical analysis of the data found in these sources. The teacher will advise on the overall approach to work, so to build capacity for work, synthesis and research student.

In the theoretical and practical sessions, examples of the applications of the subject content in relation to the Sustainable Development Goals (SDG) will be indicated, as well as in the proposals of topics for the coordinated seminars. This is intended to integrate the application of the SDGs in toxicological risk assessment teaching to provide students with related knowledge and skills, as well as to promote reflection and criticism. Of the 17 Sustainable Development Goals, special emphasis will be placed on the following goals related to toxicological risk assessment: SDG2, SDG3, SDG4, SDG5, SDG6, SDG12.

EVALUATION

To evaluate the **theoretical contents**, there will be an examination corresponding to the contents of the program. The note achieved will contribute to the final with a rate of 70%.

Computer practical classes will be evaluated through the attendance of practice classes and a written exam that will be held in the same call that the theoretical exam. The score in this evaluation represents **20%** of the final grade.

The preparation and presentation of **seminars** represent **10%** of the final grade. It will evaluate the content, structure and expression of written work and the capacity of synthesis and clarity in oral presentation.

In addition to the assessment of learning, the teacher directly assesses the student's attitude and participation in both, theoretical and practical classes.

REFERENCES

Basic

- Ballantyne B., Marrs T.C., Syversen T. General and Applied Toxicology. Third Edition. Volume 1. Ed. A John Wiley and Sons, Ltd, Publication (2009)
- Bataller Sifre R Toxicología Clínica. Universitat de Valencia. Valencia (2004).
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- http://busca-tox.com Portal de búsqueda de información toxicológica.
- http://www.aetox.es. Asociación Española de Toxicología.
- http://www.aesan.gob.es/AECOSAN/web/seguridad_alimentaria/seccion/evaluacion_de_riesgos.htm
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