In addition to the general offer of courses taught in English, some Centers also offer for incoming students English Friendly Courses (EFC): subjects taught in Spanish, in which the syllabus summary, lecturer tutoring, examinations and/or papers are available in English.

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<tr>
<th>FACULTY OF PHARMACY (125)</th>
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¹ SCHEDULE: Morning (M)/ Afternoon (A): begins at 13.30.
By clicking the subject’s name, its Syllabus will appear.
Description and contextualization of the course

Physics is one of the basic courses of the first year of the Degree in Pharmacy. Here some basic physical concepts are developed, which will be later applied in other courses of the degree, such as Instrumental Techniques.

Competences/ Learning outcomes of the course

1.- To accurately use the International System of Units and Magnitudes.
2.- To apply computational and data processing techniques to Physics-related data and information.
3.- To apply Physics-related criteria to the design of experiments.
4.- To understand the nature and effects of the different types of radiation used in medical diagnosis and therapies.
5.- To be able to interpret the symbols and parameters of the radioactive nuclei, along with understanding their physical behavior and their use in radio-pharmacy.

Common competences

To develop communication and information transmission capabilities, both oral and written.

To encourage team-work abilities.

Syllabus

Unit 1.- Observables, magnitudes, units. Dimensional equations. Scale relations. Treatment and representation of experimental data.

Unit 2.- Ideal fluid mechanics.

Unit 3.- Oscillations. Resonance phenomenon. Relation to microscopic systems.


Unit 5.- Electromagnetic waves: electromagnetic spectrum. Properties of each type of radiation, and their interaction with physical matter.

Computer practice sessions

1.- Introduction to spreadsheets: relative and absolute variables, cell filling with various types of contents, functions, formats, data tables, and graphical representation.

2.- Numerical derivation as a limit. Example: constant translational acceleration in a straight line.


Laboratory practice sessions

1.- Hooke’s Law. Determination of the elastic constant of an oscillator.

Methodology

- Lectures: classes in which the teacher will explain the contents of the course. Low/medium difficulty problems may be proposed and solved during the class, in order to help settle the newly learned concepts. Student participation is encouraged.

- Class practices: the teacher and/or designated students will solve medium/high difficulty problems from a list assigned at the start of each unit.

- Computer/laboratory practices: the students will perform experiments and computer calculations on matters closely related to the contents of the course. Student attendance is mandatory.

Evaluation systems

- Continuous assessment
- Final assessment

Weights of the exams/tests:

- Test(s) on the course contents (%): 80
- Practices (%): 20

Regular examination session (January)

Students will be able to choose between “continuous assessment” and “final assessment” modalities:

Continuous assessment

The exams and their weights break down as follows:

- Two midterm exams: 20% of the grade, 10% each.

- Final exam: 80% of the grade (20% for the practices exam, 60% for the course contents exam).
Final assessment

A single final examination will be taken at the end of the term, weighting 100% of the grade (20% for the practices exam, 80% for the course contents exam).

Extraordinary examination session (June)

The June examination will be graded following the final assessment modality, therefore a single final examination will be taken, weighting 100% of the grade (20% for the practices exam, 80% for the course contents exam).

Bibliography

Basic readings


Further readings

Serway RA, Jewett JW. Physics for Scientists and Engineers. 10th ed. Cole Publishing; 2013

Websites

The Applet Collection. Available at http://lectureonline.cl.msu.edu/~mmp/applist/applets.htm
What is a Wave? Available at http://www.acs.psu.edu/drussell/Demos/waves-intro/waves-intro.html
Nuclear Data Center at KAERI. Available at http://atom.kaeri.re.kr/
Física con ordenador. Available at http://www.sc.ehu.es/sbweb/fisica/
Description and Contextualization of the Subject

The subject "Pharmacovigilance" focuses on the study of adverse reactions induced by drugs (how to detect them, their mechanisms, clinical diagnosis and prevention), as well as on the main clinical syndromes that can occur with the use of drugs at commonly used doses for the diagnosis, prevention or treatment of the disease (pharmacopathology).

Competences / Learning outcomes of the subject

The objective of this course is to know the undesirable effects of medicines, as well as the different methods that can be used for their prevention, detection and treatment. During the course, the student will acquire the following skills:

- Know the pharmacological basis that allows to understand the particularities of drugs as a source of risks for public health.
- Know the theoretical bases of the reasoning and the epidemiological method applied to the evaluation of the safety of medicines.
- Know how to manage notifications of suspected adverse reactions performed by healthcare professionals.
- Know the most typical adverse reactions of each pharmacological group.

Theoretical-practical contents

I.- Pharmacovigilance. General features.


3.- Methods for the detection of adverse reactions to drugs. Analytical studies I.

4.- Methods for the detection of adverse reactions to drugs. Analytical studies II.

5.- Methods for the detection of adverse reactions to drugs. Descriptive studies: voluntary notification.

6.- Methods for the detection of adverse reactions to drugs. Mixed studies: monitoring of hospitalized patients.

7.- Studies about the use of medications. Sources of information on medicines.
II.- Pharmacopathology. General features.

8.- Adverse reactions to drugs. Definition. Classifications. Clinical diagnosis of adverse reactions induced by drugs.

9.- Mechanisms of adverse reactions of type A. Adverse reactions induced by pharmaceutical, pharmacokinetic and pharmacodynamic sources.

10.- Mechanisms of adverse reactions of type B. Adverse reactions of genetic basis (idiosyncrasy) and immunological (allergy to drugs).

11.- Pharmacological interactions: importance as a cause of adverse reactions to drugs.

12.- Other factors that predispose to adverse reactions to drugs. Age. Sex. Race and inheritance. Genetic polymorphisms.


III.- Pharmacopathology: Main clinical syndromes caused by drugs

IIIa. Adverse reactions by pharmacological group

15. Drugs acting on the central nervous system.


17. Antimicrobials.

18. Cardiovascular drugs.

IIIb. Main clinical syndromes caused by drugs

19.- Dermatological disorders.

20.- Gastrointestinal disorders.

21.- Liver disorders.

22.- Neurological and psychiatric disorders.

23.- Hematological and cardiovascular disorders.

24.- Respiratory disorders.

25.- Renal disorders.

26.- Endocrine and metabolic disorders.
**Methodology**

The development of the subject will include the following teaching modalities in which different teaching-learning methodologies will be used:

- Master classes, which will be open and participatory with presentation of concepts, questions and debates.

- Classroom and computer practices, in which questions and practical exercises will be carried out.

- Tutorials, where the students will be attended individually and/or in groups, in order to resolve doubts in a personalized way, in a previously established schedule that appears on the website of the Faculty and/or in a schedule previously arranged with the teaching staff.

- Virtual platform e-gela, where students will interact through forums and proposed activities/tasks.

**Evaluation system**

Continuous Evaluation System

Final Evaluation System

Tools and qualification percentages:

- Final exam (short questions where several concepts have to be developed): 70%
- Test exams: 20%
- Exam of practices (exercises, cases or problems): 10%
DERMOPHARMACY

DESCRIPTION

Skin pharmacy is a branch of Pharmacy that studies, manufactures and dispenses non-pathology-related cosmetic products. A ‘cosmetic product’ is any substance or preparation designed for contact with the superficial parts of the human body (skin, hair and capillary system, nails, lips and external genital organs) or with teeth and buccal mucosa with the aim of cleaning or perfuming them, modifying their appearance and correcting body odours, and protecting or keeping them in good condition.

SKILLS

- Know, formulate and prepare products used for the hygiene, protection and beautification of people’s skin and appendages.
- Identify states of healthy skin and the alterations/pathologies that require dermo-pharmaceutical treatment.
- Identify and select the most suitable excipients for creating different types of cosmetic formulations.
- Collect and analyse information in the field of dermo-pharmaceutics to develop and formulate a line of specific products for a particular kind of skin.

THEORETICAL PROGRAMME

GENERAL CONCEPTS

- Introduction to dermopharmacy. General concepts and scope of application of the discipline.

STRUCTURE AND PHYSIOLOGY OF THE SKIN: DERMO-PHARMACEUTICAL IMPLICATIONS.

- Histology and physiology of the skin and appendages. Basic aspects and cosmetic implications.

DERMO-PHARMACEUTICAL PREPARATIONS FOR FACIAL APPLICATION

DERMO-PHARMACEUTICAL PREPARATIONS FOR SOLAR PROTECTION


DERMO-PHARMACEUTICAL PREPARATIONS FOR BODY APPLICATION


DERMO-PHARMACEUTICAL PREPARATIONS FOR HAIR

- Other hair care products. Hair conditioners. Hair preparations for combing and hair care. Hair colouring/dyeing.
- Hair cosmetics. Hair disorders.
- Anti-dandruff and anti-sebaceous preparations.

DERMO-PHARMACEUTICAL PREPARATIONS FOR ORAL HYGIENE


SPECIFIC DERMOPHARMACEUTICAL PRODUCTS FOR MEN, MALE COSMETICS.


CONTROLS ON COSMETICS, AND LEGISLATION

- Control of cosmetic products.
- Pharmaceutical legislation on cosmetic products. Spanish and European legislation.

SEMINAR

Students will make an analysis of the type of skin presented to formulate the most suitable product. They will write a report containing 5 specific formulations for their type of skin.

PRACTICAL PROGRAMME

Preparation of different formulations
- Exfoliating gel
- Fluid or body lotion for dry skin
- Shampoo with panthenol and silk proteins
- Moisturising-nourishing cream
- After-shave cream-gel
- Serum with alpha hydroxy acids
- Facial tonic
- Aqueous dermal paste with physical filters
- Anti-acne, anti-sebaceous and keratolytic mask
- Lip salve
- Oil-free hand cream

EVALUATION

Theoretical-practical written examination (70%):
- Objective test (multiple-choice, short comprehension questions on theory, solving practical cases)
- A mark of 50% must be achieved in the exam to pass the subject

Seminar (20%):
- Presentation of the final report
- Participation in classroom sessions

Practical work (10%):
- Practical work record
DESCRIPTION AND CONTEXT OF THE SUBJECT

This subject provides an updated vision of the methodological basis of epidemiology, highlighting the special features inherent to nutritional epidemiology. This subject also inter-relates and completes knowledge that a Graduate in Nutrition and Diet acquires during the course, offering an overall vision of research in nutritional epidemiology in human beings and provides the scientific level required to work as a professional in the field of Nutrition in decision-making and therapeutic practical work.

COMPETENCES / LEARNING OUTCOMES OF THE SUBJECT

CM1. Participate in the analysis, planning, intervention and evaluation of epidemiological studies and intervention programmes in diet and nutrition in different areas (M05CM02).

CM2. Design and make nutritional evaluations to identify the population's needs in terms of diet and nutrition, and identify key factors in nutritional health (M05CM03).

CM3. Design, intervene in and carry out diet-nutrition educational programmes, and training in diet and nutrition (M05CM04).

RA1. Apply the epidemiological method to study the effect of diet on human health.

RA2. Learn about the main types of epidemiological studies used to respond to a research question.

RA3. Calculate the main epidemiological measures in different types of epidemiological studies.

RA4. Analyse statistically the data from nutritional epidemiological studies.

RA5. Evaluate the validity of the nutritional epidemiology studies.

RA5. Make bibliography searches in biomedical databases.

RA7. Critically evaluate scientific articles in the field of nutritional epidemiology.


RA9. Select methods to measure diet and the intake of the most suitable nutrients in different types of epidemiological studies.
RA10. Carry out teamwork in a collaborative and cooperative manner.

Themes

Introduction to epidemiology. Nutritional Epidemiology.

Types of study design in nutritional epidemiology.

Frequency measures / association and effect measures.

Causality

Validity in nutritional studies. Bias and confusion

METHODOLOGY

1. In theory classes (lectures) the concepts of the subject will be taught, with student participation in occasional debates.

2. In the practical work sessions, individual and collective exercises will be done. Problem-solving in class will be done in a participative way. Problems and exercises will be provided to be worked on individually or in groups, to go into greater detail in the theoretical knowledge of the subject and relate Public Health to other similar areas.

3. In the practical work with computers the students will make bibliography searches using biomedical search engines, and they will carry out epidemiological exercises to learn how to calculate the main measures of frequency and effect applied to different epidemiological studies. At the end, each group will present the main methodological aspects of the study they have worked on to their fellow students. In this way, the formulation of questions and open discussion will be encouraged so that students can acquire skills related to oral communication, the ability to summarise and work in a team.
**ASSESSMENT**

Assessment will be in the combined modality, as follows:

- Information search, exercises, participation, attitude and attendance: 15%
- Group work: 25%
- Theory-practice exam 60%

Final grade: \[(\text{Theory-practice exam} \times 0.60) + (\text{Group work} \times 0.25) + (\text{Information search, exercises, participation, attitude and attendance} \times 0.15)\].

Clarifications:

- If the student does not present him/herself at the exam he/she will be considered to have withdrawn from the call and will appear as “Not presented”.
- Minimum mark to pass the subject: 5 points
- Minimum mark to pass the theory-practical exam: 5 points.
MOLECULAR BIOLOGY

DESCRIPCION Y CONTEXTUALIZACION

Molecular Biology studies the composition, structure and functions of the macromolecules that constitute living organisms, with a focus on hereditary material and on how genes and genomes work. Building upon the knowledge acquired in the general “Biochemistry” class, in the “Molecular Biology” class the structure of genetic material (DNA and RNA), its organization and its metabolism, its repair mechanisms and a general overview of the DNA technology will be provided.

COMPETENCIAS

1.- Knowing the composition, structure and metabolism of macromolecules involved in the transmission and expression of genetic information, as well as understanding the behavior of genetic material in vivo and in vitro.
2.- Understanding the technology of recombinant DNA
3.- Knowing the technology used to obtain recombinant proteins that are interesting in the health sciences
4.- Knowing genetic variations that cause heredity conditions and understanding the bases for their analysis
5.- Knowing the bases for gene therapy
6.- Being able to analyze nucleic acids
7.- Knowing gene cloning, analysis and identification techniques.

CROSS-CUTTING SKILLS

8.- Searching information related to the subject, team-work and ability to express correctly molecular biology concepts.

CONTENIDO TEORICO-PRACTICO

0.- INTRODUCTION OF THE CLASS.

TRANSMISSION AND EXPRESSION OF GENETIC INFORMATION

1.- INTRODUCCIÓN DEL TEMA.
2.-SECONDARY AND TERTIARY STRUCTURE OF DNA
3.- AMINOACIDS AND NUCLEOTIDES.
4.- DNA REPLICATION
5.- RNA STRUCTURE AND METABOLISM.
6.- PROTEIN SYNTHESIS.
7.- REGULATION OF GENE EXPRESSION

TECNOLOGÍA BASADA EN LA INFORMACIÓN GENÉTICA
8. NUCLEIC ACID HYBRIDATION
9. DNA CLONING
10. CELLULAR DNA CLONING.
11. DNA SEQUENCING
12. GENE ANALYSIS FOR DIAGNOSTICS
13. GENE THERAPY
14. APPLICATIONS FOR GENETICALLY MODIFIED ORGANISMS
15. GENE TRANSFER INTO ANIMAL CELLS
16. GENETICALLY MODIFIED PLANTS

METODOLOGIA

LECTURES: 45 hours. They will deal with theory, exercises (problems, questionnaires, etc.)

WET-LAB: 2 sessions. 4 hours each.

1. DNA extraction and purification. Purity determination. DNA quantification. Hyperchromic effect to characterize DNA.

2. PCR of the STR region of human DNA. Electrophoretic separation and staining of amplified fragments on agarose gels. Lab report.

COMPUTER-LAB: 2 sessions, 3.5 hours each.

1. Virtual lab (cibertorio) to analyze and diagnose the beta-S globin polymorphism by RFLP. Sequence analysis in databases, selection of an appropriate restriction enzyme, diagnosis of drepanocytosis by RFLP. Questionnaire.

2. Bioinformatics analysis of a DNA microarray.

INDIVIDUAL STUDY ACTIVITIES: 90 horas.

- Consulting texts, working out diagrams and studying
- Reading texts related to the subject
- Solving and working on exercises and problems presented during lectures
- Answering to questionnaires in eGela
- Using Information Technology (IT) to see videos, animations, figures and work on proposed exercises.

CONVOCATORIA ORDINARIA
- In order to pass the class, students must obtain 5 out 10 points in the lab test and 6 out 10 points in the final written test. In addition, students choosing the continuous grading system must obtain 50% of the points in the individual and team exercises and the weighted average must result in 5 or more points out of 10.

- Labs must be attended by all students if they haven’t done them before, and regardless of this fact, by all students choosing continuous grading. In order to be able to do the lab test, the corresponding lab reports must have been turned in.

- All students have the right to choose the final grading system with which they can obtain 100% of their grade from the final test. In order to choose this option, students must request it within the first 9 weeks of the quarter. The final test for students choosing the final grading system will contain additional questions.

- Students choosing continuous grading may request the call not to be considered at least a month (or earlier) before the test. Absent this request, the student will just have the continuous evaluation grade.

- Any additional specification related to the class that is not indicated here will be according to current regulations.
MICROBIOLOGY AND FOOD HYGIENE
3RD YEAR OF HUMAN NUTRITION AND DIETETICS

The subject Microbiology and Food Hygiene of is a compulsory subject of the 3rd year of the Human Nutrition and Dietetics Degree. It is located within the module 02 called Food Sciences and is complemented with the subject Microbiology and General Parasitology. The general objective pursued is aimed at the students acquire knowledge about microorganisms and their role in Food Safety. In addition, it seeks to acquire enough skills so that, at the end of the course, they are trained to analyze and solve specific problems related to microbiology and food hygiene.

After completing this subject, it is intended that the student achieve the following specific and transversal competences:

Specific competences
1. Analyze the importance of microorganisms as pathogens transmitted by food, as agents responsible for alterations of food and as agents involved in the production of food.
2. To evaluate the factors that affect the survival and microbial growth in food, the procedures for modifying these factors to reduce the prevalence of foodborne diseases and to increase the shelf life of the food.
3. Apply microbiological techniques for the analysis of food and control of food hygiene in the stages of food processing and interpret their results.
4. Define the basic characteristics of food from the point of view of Microbiology and Food Hygiene.

Cross-disciplinary competences
1. Develop autonomous learning strategies.
2. Communicate effectively and clearly, both orally and in writing.
3. Ability to solve problems and make decisions.
4. Learn to obtain information effectively from books and specialized magazines, as well as from other sources of information.
5. Critically evaluate and know how to use information sources.

CONTENTS

A. FOOD AS A SUBSTRATE FOR MICROORGANISMS
1. Introduction to Microbiology and Food Hygiene.
2. Food microbiota.
3. Food as a substrate for microorganisms.

B. MICROORGANISMS AND PARASITES RESPONSIBLE FOR DISEASES TRANSMITTED BY THE FOODS
4. Intoxication and infection transmitted by food.
5. Genus Salmonella and Shigella.
7. Genus Campylobacter.
12. Genus Clostridium.
13. Other bacterial genera with capacity to be transmitted by water and food.
14. Foodborne viruses.
15. Prions transmitted by food.
16. Toxigenic mushrooms and algae.
17. Parasites transmitted by food: protozoa.
18. Parasites transmitted by food: helminths.

C. MICROORGANISMS RESPONSIBLE FOR ALTERATIONS OF FOOD
19. Alterations in food produced by microorganisms.

D. MICROORGANISMS OF INTEREST IN THE PRODUCTION OF FOOD
20. Microbial fermentations in food production.
21. Probiotic and prebiotic foods

E. CONTROL OF MICROORGANISMS IN FOOD
22. Effect of temperature on the survival and growth of microorganisms in food.
23. Effect of irradiation, modification of water activity and the use of high pressures in the survival and growth of microorganisms in food.
24. Effect of changes in pH and the use of acidulant preservatives in the survival and growth of microorganisms in foods.
25. Effect of changes in the environmental atmosphere of conservation on the survival and growth of microorganisms in food.
26. Sanitation and sterilization
27. Staff health and hygiene

Practical contents

A) Detection and counting of microorganisms indicating contamination and pathogenic microorganisms by means of different counting techniques and different culture media.
B) Control of hygiene of the manipulator and of surfaces by crops, practical cases, ATP bioluminescence, etc.

METODOLOGY
In this subject, various teaching methodologies are used.

In the master mode, exposition classes will be taught in which the professor will explain the topics of the theoretical program. Even in the case of lectures by teachers, the active participation of students will be encouraged through open discussion of questions, questions and cases. In this way, in addition to deepening theoretical knowledge, students will be able to acquire skills for oral communication and ability to synthesize.

In the laboratory practices, the students will complement the knowledge acquired in the classroom by carrying out, in pairs and always under the supervision of the teacher, microbiological techniques. You will thus deepen the theoretical knowledge of the subject and acquire knowledge and technical skills.

The seminars will complement the practical aspects of the theory presented in the lectures. In these sessions case studies will be carried out, in which the students will analyze and expose an outbreak of food origin that they will have previously chosen and worked in small groups. In this way, the students will work on teamwork skills, bibliographic search, synthesis skills and oral communication.
CONTINUOUS ASSESSMENT

1. Continuous evaluation: 35%
   - An individual written test on the practices carried out in the subject that will consist of short questions: 20%
   - A group work that will consist in the search of information and preparation of an exhibition and oral discussion of a practical case related to the subject: 15%

2. Individual final test: 65%
It will consist of a test of 70 multiple choice questions with a penalty (0.3).

The final grade will be obtained from the sum of the previous grades, but it is necessary to pass both the final individual test and the examination of the practices to pass the subject. The notes will only be valid during the current academic year.

To renounce the ordinary call it is necessary to communicate this resignation in writing to the faculty at least 1 month before the end of the teaching period of the subject

RECOMMENDED BIBLIOGRAFY

DESCRIPTION & CONTEXTUALISATION OF THE SUBJECT

The course is designed as an optional matter targeted to those students interested in developing a professional profile oriented towards research and management of plant biodiversity. It develops and expands the concepts given by Plant Biology and Ecology, under a more applied perspective.

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

It is intended to gain solid skills on the techniques of monitoring and evaluation of environmental stress, together with their methodological and conceptual bases. In its more applied side, the course introduces some bioengineering techniques such as phytoremediation and plant ecological restoration.

THEORETICAL/PRACTICAL CONTENT

Theoretical lessons

Practical lessons
7. Techniques to model and measure environmental stress in plants. Examples of metabolite analysis (ascorbate), physiological processes (chlorophyll fluorescence) and cellular integrity. Study of stress sensitive and tolerant ecotypes.
9. Critical analysis of a restoration or phytoremediation project similar to those studied in the course (phytoremediation, restoration, species recovery).

METHODS

ASSESSMENT SYSTEMS
- Final assessment system

TOOLS USED & GRADING PERCENTAGES
- Extended written exam 40%
The evaluation of the subject will be through a mixed system. The qualification of the subject will be composed of several criteria and will be proportional to the number of credits of each type of teaching. Specifically, the lectures (60% of the total credits) will be evaluated through a theoretical exam (A) and continuous assessment/evaluation (B). The practice (laboratory and field work) and the seminars (remaining 40%) will be evaluated by an exam (C) and by the qualifications of seminars and practice questionnaires and reports (D). The final qualification is calculated as follows: final qualification = 0.5*A + 0.1*B + 0.1*C + 0.3*D

ORDINARY EXAM CALL: GUIDELINES & DECLINING TO SIT
The evaluation of the subject will be through a mixed system. The qualification of the subject will be composed of several criteria and will be proportional to the number of credits of each type of teaching. Specifically, the lectures (60% of the total credits) will be evaluated through a theoretical exam (A) and continuous assessment/evaluation (B). The practice (laboratory and field work) and the seminars (remaining 40%) will be evaluated by an exam (C) and by the qualifications of seminars and practice questionnaires and reports (D). The final qualification is calculated as follows: final qualification = 0.5*A + 0.1*B + 0.1*C + 0.3*D

EXTRAORDINARY EXAM CALL: GUIDELINES & DECLINING TO SIT
There is the possibility that students renounce the mixed evaluation system choosing for the final evaluation, regardless of whether or not they have participated in the aforementioned mixed evaluation. To do this, the voluntary waiver/resignation letter of the mixed evaluation must be submitted in writing within a period of 9 weeks from the beginning of the semester. In the final evaluation the acquisition of the competences of the subject will be evaluated through a theoretical exam (oral and written) and a practical (laboratory) exam. In any case, the evaluation and resignation criteria will always be adjusted to what is contemplated in the Regulations relating the Evaluation of the Students of the Undergraduate Degrees (BOPV no50, March 13, 2017).

COMPULSORY MATERIALS
- Lab coat
- Field boots/SHOES

BIBLIOGRAPHY
Basic bibliography

In-depth bibliography
- www.plantstress.com, general plant stress physiology
- www.plantphysiol.org, American Society of Plant Physiology
- www.aeet.org, Spanish Society of Terrestrial Ecology

REMARKS
Description and contextualization of the course

Physics is one of the basic courses of the first year of the Degree in Environmental Sciences and the Degree in Food Science and Technology.

This course offers a overall view of Physics, aimed towards basic concepts such as magnitudes and units, laws of motion, work and energy, and gravitational and electric forces.

Competences/ Learning outcomes of the course

1.- To accurately use the International System of Units and Magnitudes.
2.- To apply computational and data processing techniques to Physics-related data and information.
3.- To correctly recognize and interpret the natural forces involved in a physical phenomenon.
4.- To apply Physics-related criteria to the design of experiments.
5.- To acquire basic knowledge regarding the concept of field, mainly electric and magnetic fields, as well as forces an electrostatic potential.

Common competences

To develop communication and information transmission capabilities, both oral and written.

To encourage team-work abilities.

Syllabus

Unit 1.- Observables, magnitudes, units. Significant figures.

Unit 2.- Laws of motion. Inertia, equilibrium, acceleration. Motion in a straight line, circular and parabolic. Inertial and non inertial frames of reference. Relative motion. Energy and work. Conservative and non conservative forces.


Methodology
- Lectures: classes in which the teacher will explain the contents of the course. Low/medium difficulty problems may be proposed and solved during the class, in order to help settle the newly learned concepts. Student participation is encouraged.

- Class practices: the teacher and/or designated students will solve medium/high difficulty problems from a list assigned at the start of each unit.

- Computer/laboratory practices: the students will perform experiments and computer calculations on matters closely related to the contents of the course. Student attendance is mandatory.

Evaluation systems
- Continuous assessment
- Final assessment
- Weights of the exams/tests:
  - Test(s) on the course contents (%): 80
  - Practices (%): 20

Regular examination session (May)
Students will be able to choose between “continuous assessment” and “final assessment” modalities:

Continuous assessment
The exams and their weights break down as follows:
- Two midterm exams: 20% of the grade, 10% each.
- Final exam: 80% of the grade (20% for the practices exam, 60% for the course contents exam).

Final assessment
A single final examination will be taken at the end of the term, weighting 100% of the grade (20% for the practices exam, 80% for the course contents exam).

Extraordinary examination session (July)
The July examination will be graded following the final assessment modality, therefore a single final examination will be taken, weighting 100% of the grade (20% for the practices exam, 80% for the course contents exam).
Bibliography

Basic readings

Further readings

Websites
http://www.sc.ehu.es/sbweb/fisica/
http://lectureonline.cl.msu.edu/~mmp/applist/applets.htm
http://phet.colorado.edu/index.php
http://www.phy.ntnu.edu.tw/ntnujava/index.php
GALENIC PHARMACY

- SUBJECT: Galenic Pharmacy
- DEPARTMENT: Pharmacy and Food Sciences
- ACADEMIC YEAR: 3
- FOUR-MONTH PERIOD: 2
- TYPE: Compulsory
- ECTS CREDITS: 9

Galenic Pharmacy is a subject in which the basic principles of the design of drug delivery systems are studied. These principles are based on the physico-chemical properties of the active ingredients, the characteristics of the dosage forms, and the physio-pathological conditions of the patients. Therefore, concepts that the students have previously taken in other subjects of the degree (such as Physico-chemistry, Human Anatomy or Human Physiology) are handled. These subjects are scheduled in the 1st or 2nd academic year.

This subject is closely related to the subjects Biopharmacy and Pharmacokinetics, Pharmaceutical Technology I, and Pharmaceutical Technology II, scheduled in the 4th academic year. It is convenient that the students take the subject Galenic Pharmacy before taking the mentioned subjects.

GALENIC PHARMACY

SPECIFIC SKILLS

1. Evaluate the influence of anatomic and physiological aspects of the site of administration on the disposition of drugs.

2. Identify and assess the properties of the drugs that condition their disposition in the organism from the dosage forms.

3. Analyse and evaluate the biopharmaceutical behaviour of drug products that condition the design of the dosage forms.

4. Select the most suitable route of administration based on the characteristics of the patient, the drug, and the desired therapeutic effect.

5. Determine the bioavailability, evaluate the bioequivalence, and know the factors that condition them.
TRANSVERSAL SKILLS

1. Develop communication and information skills, both oral and written, to deal with patients and users of the work center where the professional activity is performed. Promote working and collaborative capacities in multidisciplinary teams and those capacities related to other healthcare professionals.

2. Recognize the own limitations and the need to maintain and update professional skills, paying special attention to the self-learning of new knowledge based on the available scientific evidence.

THEORETICAL PROGRAMME

MODULE I: RELEASE AND ABSORPTION OF DRUGS
1. Introduction to Galenic Pharmacy.
2. Transit of drugs in the organism: concept of LADME.
3. Drug release.
4. Drug absorption.

MODULE II: ENTERAL ROUTES OF ADMINISTRATION OF DRUGS
5. Drug administration routes.
6. Oral administration.
7. Buccal administration
8. Rectal administration.

MODULE III: PARENTERAL ROUTES OF ADMINISTRATION OF DRUGS
10. Intravenous and intra-arterial drug administration.
11. Intramuscular administration.
12. Subcutaneous administration.
13. Other routes of parenteral administration.

MODULE IV: ADMINISTRATION OF DRUGS THROUGH MUCOUS
14. Nasal administration
15. Pulmonary administration.
16. Administration of drugs in the skin.
17. Ophthalmic administration.
18. Administration in the ear.
19. Vaginal administration.

MODULE V: ADMINISTRATION OF DRUGS IN THE CENTRAL NERVOUS SYSTEM
20. Administration of drugs in the central nervous system.
MODULE VI: BIOAVAILABILITY AND BIOEQUIVALENCE
22. Bioequivalence.

MODULE VII: ADMINISTRATION OF BIOLOGICAL DRUGS
23. Administration and delivery of therapeutic peptides and proteins.

PRACTICAL PROGRAMME
Practice 1. Determination of the partition coefficient of salicylic acid.
Practice 2. Influence of the excipient in the release of active ingredients based on an iodine ointment: release test.
Practice 3. Release study of pantoprazole from gastro-resistant tablets using a continuous flow dissolving equipment.
Practice 4. Determination of the solubility of drugs.
Practice 5. Dissolution kinetics of furantoin from tablets.
Practice 6. Evaluation in of the permeation capacity of various semi-solid formulations by using Franz cell chambers.

COMPUTER PRACTICES:
1. “Biopharmaceutics” program.
2. In vitro equivalence study of citalopram formulations.

CLASSROOM PRACTICES
1. Dissolution kinetics: a practical case
2. Calculation of the permeability constant of a drug: a practical case
3. Preparation of the group work
4. Bioequivalence study: a practical case
5. Self-evaluation tests

METHODOLOGY
1. Lectures. (5.5 ECTS)
2. Classroom practices: solving practical cases. (0.5 ECTS)
3. Practical laboratory classes. (2.6 ECTS)
4. Practical computer class. (0.4 ECTS)
5. Self-evaluation tests through the e-Gela platform.

COMBINED EVALUATION SYSTEM
Compulsory written test.
Requirements:
Absence of conceptual errors
Obtain a score higher than 0 in at least 70% of the questions
Obtain a minimum of 5 points
Spelling and syntax errors will be penalised depending on their number (-0.1 points for each one, up to a maximum of -0.5 points).

**Practical classes.**
Attendance at and benefit from practical classes. Scores from 0 to 5.
Punctuality
Good housekeeping
Attitude
Results and preparation of the practice book
To pass the practical part of the subject, the sum of the scores in sections A and B must be 7 points as a minimum.
Laboratory examination. Students who have not attended all the practical classes. The following will be considered: good housekeeping, laboratory skills and the results and preparation of the final report.

**Oral presentation and debate on the group work.** 10-15-minute oral presentation of a scientific publication related to the subject, using an audiovisual followed by a 10-minute debate. The professors will decide which part of the work will be presented by each student. An evaluation matrix will be used to evaluate each student. It will be handed over together with the work. The final mark for the work (7%) will be the same for the members of the group (i.e. average for the group). The percentage of this test in the final mark is 15% (7% work and 8% oral presentation).

**Withdrawal:** The student must submit her/his exam withdrawal request. The deadline will be the day before the official call.

**EXTRAORDINARY CALL**
The positive results of the activities of continuous evaluation (laboratory practices and group work) will be maintained in the extraordinary call.

**BIBLIOGRAPHY**


ELECTRONIC DOCUMENTS

3. www.wits.ac.za/pharmacy/biopharmacy.htm
4. A First Course in Pharmacokinetics and Biopharmaceutics. David Bourne, Ph.D. www.boomer.org/c/p1/
5. www.farm.kuleuven.ac.be/pharbio/aplink.htm
7. WILEY. http://www3.interscience.wiley.com
8. ELSEVIER http://www. Sciencedirect.com