Teaching guide

IDENTIFICATION DETAILS

Degree:	Pharmacy
Scope	Pharmacy
Faculty/School:	Experimental Sciences
Course:	PHARMACEUTICAL TECHNOLOGY I
Type:	Compulsory
ECTS credits:	12
Year:	4
Code:	2545
Teaching period:	Seventh semester
Subject:	Pharmaceutical Technology
Module:	Pharmacy and Technology
Teaching type:	Classroom-based
Language:	Spanish
Total number of student study hours:	300

SUBJECT DESCRIPTION

Pharmaceutical Technology is the body of knowledge applicable to the preparation of drugs that includes design, development and evaluation.

The preparation of medicines is approached from a masterly point of view and fundamentally from an industrial point of view.
At the level of the preformulation, formulation and evaluation processes of different solid pharmaceutical forms and sterile forms. This includes knowledge of the packaging materials used in the manufacture of drugs.

GOAL

With the knowledge acquired, pharmacists can use technology at the current state of science to be able to design, formulate, manufacture and control drugs in the appropriate pharmaceutical form that can be dispensed safely and effectively to patients both at the master's, office or industrial levels.
Discover the pharmacist's ability to use their skills and knowledge to provide improvements in traditional pharmaceutical forms and design new, safer and more effective forms of manufacturing.

PRIOR KNOWLEDGE

In order to get the best out of the subject, prior knowledge of the basics of Physiology, Chemistry, Physicochemistry and Pharmacology is recommended.

COURSE SYLLABUS

THEORETICAL PROGRAM: Block I: Introduction to Pharmaceutical Technology Block II: Masterful Formulation Block III: Pharmaceutical Quality Control Block IV: Preformulation Studies. Block V: Water in drug manufacturing processes. Block VI: Basic Operations. Block VII: Solid pharmaceutical forms. Block VIII: Parenteral pharmaceutical forms Block IX: Packaging. PRACTICAL PROGRAM: In the laboratory, the necessary processes are carried out to develop some of the solid pharmaceutical forms seen throughout the theoretical program of the subject, such as capsules, tablets or granulates, standard working procedures and some pharmacotechnical quality controls will be developed during the manufacturing process and in the finished product.

EDUCATION ACTIVITIES

(AFP1) THEORY CLASSES: Theoretical content is taught and will be complemented by interactive audiovisual material and documentation provided through the virtual classroom of the subject.
(AFP2) PRACTICAL CLASSES: Students will carry out experimental work in the teaching laboratory guided by the teacher following the internship script that they will have previously available.
(AFP3) CLASSES OF EXERCISES AND PROBLEMS: The resolution of exercises and tasks is proposed, explaining the methodology to continue to guide the student in the preparation of the works required by the teacher.
(AFP4) SEMINARS: Through the virtual classroom, complementary exercises and problems will be proposed to deepen classroom learning.
(AFP5) TUTORING: individual and/or group to monitor the evolution of learning and guide students throughout the development of the subject.
The Virtual Classroom platform will be very useful for the study of the subject and for effective communication between student-teacher and student-student. In the Virtual Classroom, students will have basic information and material and support for classes to promote the study of the subject. It will also allow the submission of scheduled exercises and activities, solved individually and/or in groups.

DISTRIBUTION OF WORK TIME

TEACHER-LED TRAINING ACTIVITIES	INDIVIDUAL WORK
124 Horas	176 Horas

Cross Skills

To be able to apply the theoretical knowledge learnt in the of solving problems and practical cases linked to the various subjects.

LEARNING RESULTS

Design, optimize and develop pharmaceutical forms while ensuring their quality, including the formulation and quality control of drugs, the development of master formulas and official preparations.

Apply quality control of medical, dermopharmaceutical and cosmetic products and packaging materials.

Know the physico-chemical and biopharmaceutical properties of the active ingredients and excipients as well as the possible interactions between the two.

Know the stability of active ingredients and pharmaceutical forms as well as the methods of study.

Know the basic operations and technological processes related to the development and control of medicines.

SPECIFIC LEARNING RESULTS

Provide the necessary knowledge of the basic operations to adapt the raw material of medicines, as well as of the transformation operations required for their conversion into intermediate products used for the manufacture of medicines.

Introduce the student to the knowledge, understanding and learning of the design of pharmaceutical forms, in order to achieve an effective and safe therapeutic response to the drug that includes the formulation of the finished drug.

Technological operations and materials involved in the manufacture of drugs.

Drug packaging and packaging operations and materials.

Medication Control.

LEARNING APPRAISAL SYSTEM

REGULAR EVALUATION SYSTEM
This system is the priority one, it is applicable to all students and is based on continuous evaluation.
The evaluation will take into consideration:
- (SE1) Written or oral, developmental, short answer or test-type tests: 50%
- (SE2) Daily activities and exercises: 8%
- (SE3) Individual and group work: 20%
- (SE4) Attendance and participation in face-to-face classroom activities: 2%
- (SE8) Attendance and participation in face-to-face activities in the laboratory: 20%

ALTERNATIVE EVALUATION SYSTEM for students in second or subsequent enrollment:
- (SE1) Written or oral, developmental, short answer or test-type tests: 60%
- (SE2) Daily activities and exercises: 5%
- (SE3) Individual and group work: 15%
- Attendance and participation in face-to-face activities in the laboratory (SE8): 20%

Students in second or subsequent enrollment must contact the teacher to request to take advantage of this system.

Pass the subject:
The theory (theory exam) and practice (laboratory practice exam) parts must both be approved with a score higher than 5 in order to be able to calculate the final grade. The course is approved with a grade equal to or greater than 5 out of 10. If the theory part is approved, but not the practical one, the score of the theoretical exam will be kept until the extraordinary call. The same will happen if the practical part is approved but not the theoretical part. The grades obtained from the submissions of papers, attendance and face-to-face activities in the classroom will also be kept in the extraordinary call. Once a positive evaluation (equal to or greater than 5 out of 10) of a test or work has been received, it is no longer possible to choose to repeat that test or work to modify the grade. Passing the Laboratory Practices is a necessary condition to pass the subject (greater than or equal to 5 out of ten). The unjustified absence of any of the practical sessions leads to the loss of the right to an internship evaluation in the ordinary call and a suspension of the course. Students in this situation should immediately contact the teacher. Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with the university's Evaluation Regulations and Coexistence Regulations.

ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following principles:
a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.
b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.
c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website(https://www.ufv.es/gestion-de-la-informacion_biblioteca/).
d) The results obtained through AI systems or services must always be verified. As the author, the student is responsible for their work and for the legitimacy of the sources used.
2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the Guide for the Responsible Use of Artificial Intelligence in Studies at UFV. Additionally, the lecturer may request other types of individual commitments from the student when deemed

necessary.
3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

BIBLIOGRAPHY AND OTHER RESOURCES

Basic

Ramón Martínez Pacheco (ed.). Pharmaceutical Technology Treaty/Madrid: Summary, 2016.

AEMPS. Spanish Agency for Medicines and Medical Devices Good Manufacturing Standards 2024
(AEMPS. Spanish Agency for Medicines and Medical Devices Good Manufacturing Standards 2024 ,
https://www.aemps.gob.es/fabricacion-de-medicamentos/)

Additional

THEME. European Medicines Agency Pharmaceutical industry 2024
(THEME. European Medicines Agency Pharmaceutical industry 2024 ,
https://www.ema.europa.eu/en/pharmaceutical-industry-0)

EMA.European Medicines Agency ICH guidelines 2024
(EMA.European Medicines Agency ICH guidelines 2024 , International Council for Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH).)