Hybrid Master's Degree

Production and Development of Individualized Medicines

tech global university

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Hybrid Master's Degree

Production and Development of Individualized Medicines

Modality: **Hybrid (Online + Clinical Internship)**
Duration: **12 months**
Certificate: **TECH Global University**
Accreditation: **60 + 4 ECTS**
Website: **www.techtitute.com/us/pharmacy/hybrid-master-degree/hybrid-master-degree-production-development-individualized-medicines**

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01

Introduction

Production and Development of Individualized Medicines is undergoing rapid progress, driven by the convergence of innovative technologies and the growing demand for personalized treatments. Indeed, with the emergence of Pharmacogenomics and Bioinformatics, the way in which drugs are designed and produced is being transformed, allowing therapies to be tailored to the specific genetic and biometric characteristics of each patient. In this context, TECH has developed a comprehensive program divided into two parts. The first has a 100% online format and is totally flexible, requiring only an electronic device with an Internet connection. The second part consists of a 3-week practical stay in a national reference pharmaceutical laboratory.

Thanks to this Hybrid Master's Degree, you will cover several fundamental aspects for the personalization of pharmaceutical treatments, including a practical stay of 3 weeks"

Production and Development of Individualized Medicines is experiencing significant advances driven by genomics and biotechnology. The ability to sequence the human genome quickly and accurately has made it possible to identify genetic variants that influence patients' response to treatments. This has led to the development of personalized therapies that can be tailored specifically to the genetic and biometric characteristics of each individual patient.

This is how this Hybrid Master's Degree was born, which will examine the basics of individualized formulation, providing professionals with the essential knowledge on how to design personalized treatments that meet the specific needs of each patient.

Likewise, crucial aspects such as Biopharmacy and Pharmacokinetics will be addressed, which are fundamental to understand how drugs interact with the body and are metabolized. In addition, the study plan will devote time to the different pharmaceutical forms whether topical, liquid, solid, mucosal or sterile, providing a practical approach on how to formulate and administer various types of treatments according to the patient's needs. Likewise, advanced topics will be explored, such as the use of essential oils, excipients, bases and coadjuvants in master formulation, as well as the essential physicochemical operations to guarantee the quality and stability of the products produced.

Therefore, TECH has implemented a university program of high academic quality, divided into two distinct stages. During the first stage, graduates will delve into the theory of Production and Development of Individualized Medicines in a totally online modality, avoiding the problems that may arise from traveling to a physical center and adjusting to a pre-established schedule. In the second stage, students will dedicate 3 weeks to an exhaustive practical stay in a prestigious pharmaceutical laboratory, working in a real environment with a team of experts.

This **Hybrid Master's Degree in Production and Development of Individualized Medicines** contains the most complete and up-to-date scientific program on the market. The most important features include:

- Development of more than 100 clinical cases presented by pharmacology professionals who are experts in individualized medicine and university professors with extensive experience in drug development
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- All of this will be complemented by theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection
- In addition, they will be able to do an internship in one of the best pharmaceutical laboratories in the world

You will ensure that the manufacturing processes comply with regulatory standards, guaranteeing the safety and efficacy of customized pharmaceutical products"

Take an intensive 3-week internship in a prestigious pharmaceutical laboratory and acquire all the knowledge to grow personally and professionally"

In this proposal for a Hybrid Master's Degree, of a professionalizing nature and blended learning modality, the program is aimed at updating pharmacology professionals who work in laboratories specialized in individualized medicine, and who require a high level of qualification. The contents are based on the latest scientific evidence, and oriented in a didactic way to integrate theoretical knowledge in pharmacological practice, and the theoretical-practical elements will facilitate the updating of knowledge and allow decision making in patient management.

Thanks to its multimedia content elaborated with the latest educational technology, they will allow the pharmacology professional to obtain a situated and contextual learning, that is to say, a simulated environment that will provide an immersive learning programmed to qualify in real situations. This program is designed around Problem-Based Learning, whereby the physician must try to solve the different professional practice situations that arise during the course. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

You will gain profound knowledge of mucosal and sterile pharmaceutical forms, as well as the use of essential oils, excipients, bases and coadjuvants in master formulation.

You will master the most advanced techniques in the development of individualized medicines, enabling you to innovate in a constantly evolving field. What are you waiting for to enroll?

02

Why Study this Hybrid Master's Degree?

Studying this Hybrid Master's Degree in Production and Development of Individualized Medicines will offer an invaluable opportunity for professionals in the pharmaceutical field. This program combines the flexibility of distance learning with the direct interaction of a hands-on internship, allowing graduates to explore in depth the latest innovations in the personalization of pharmaceutical treatments. Therefore, with a focus on aspects such as master formulation, biopharmaceutics and pharmacokinetics, pharmacists will be prepared to face contemporary challenges in the development of drugs tailored to the individual needs of patients.

You will strengthen your technical and practical practitioner skills, positioning yourself as a leader in a constantly evolving field, and contributing to the advancement of personalized medicine"

1. Updating from the latest technology available

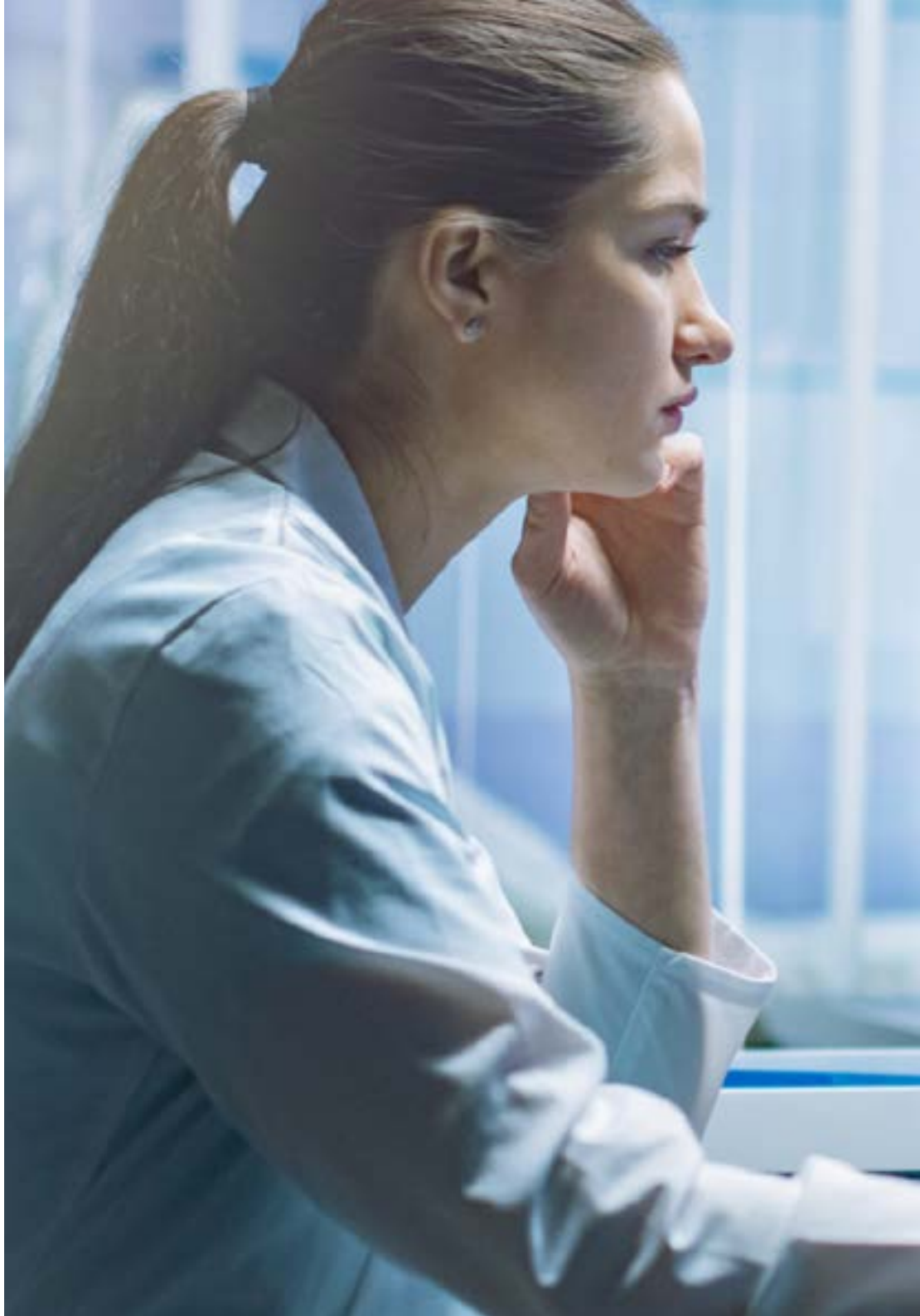
Technological innovations not only improve the efficacy and safety of drug treatments, but also accelerate the process of developing and approving new drugs, marking a milestone in the evolution of personalized pharmacotherapy. For example, Artificial Intelligence and machine learning are used to analyze large volumes of genetic and clinical data, identifying patterns and predicting responses to treatments. In addition, 3D printing of drugs enables the production of personalized doses and specific drug combinations, tailored to individual patient needs.

2. Gaining in-depth knowledge from the experience of top specialists

The large team of professionals that will accompany specialists throughout the practical period is a first-class and an unprecedented guarantee of updating. With a designated tutor, students will work with real pharmaceutical products in a state-of-the-art environment, which will allow them to incorporate into their practice the most effective procedures and approaches in the Production and Development of Individualized Medicines.

3. Entering first-class environments

TECH carefully selects all available centers for Internship Programs. Thanks to this, specialists will have guaranteed access to a prestigious pharmaceutical laboratory in the area of Production and Development of Individualized Medicines. In this way, they will be able to see the day-to-day work of a demanding, rigorous and exhaustive area, always applying the latest techniques and scientific postulates in its work methodology.



4. Combining the best theory with state-of-the-art practice

The academic market is plagued by teaching programs that are poorly adapted to the daily work of specialists and that require long teaching hours, often not very compatible with personal and professional life. For this reason, TECH offers a new model of practical learning, which allows to conduct state-of-the-art procedures in the field of Production and Development of Individualized Medicines and to put it into professional practice in 3 weeks.

5. Opening the door to new opportunities

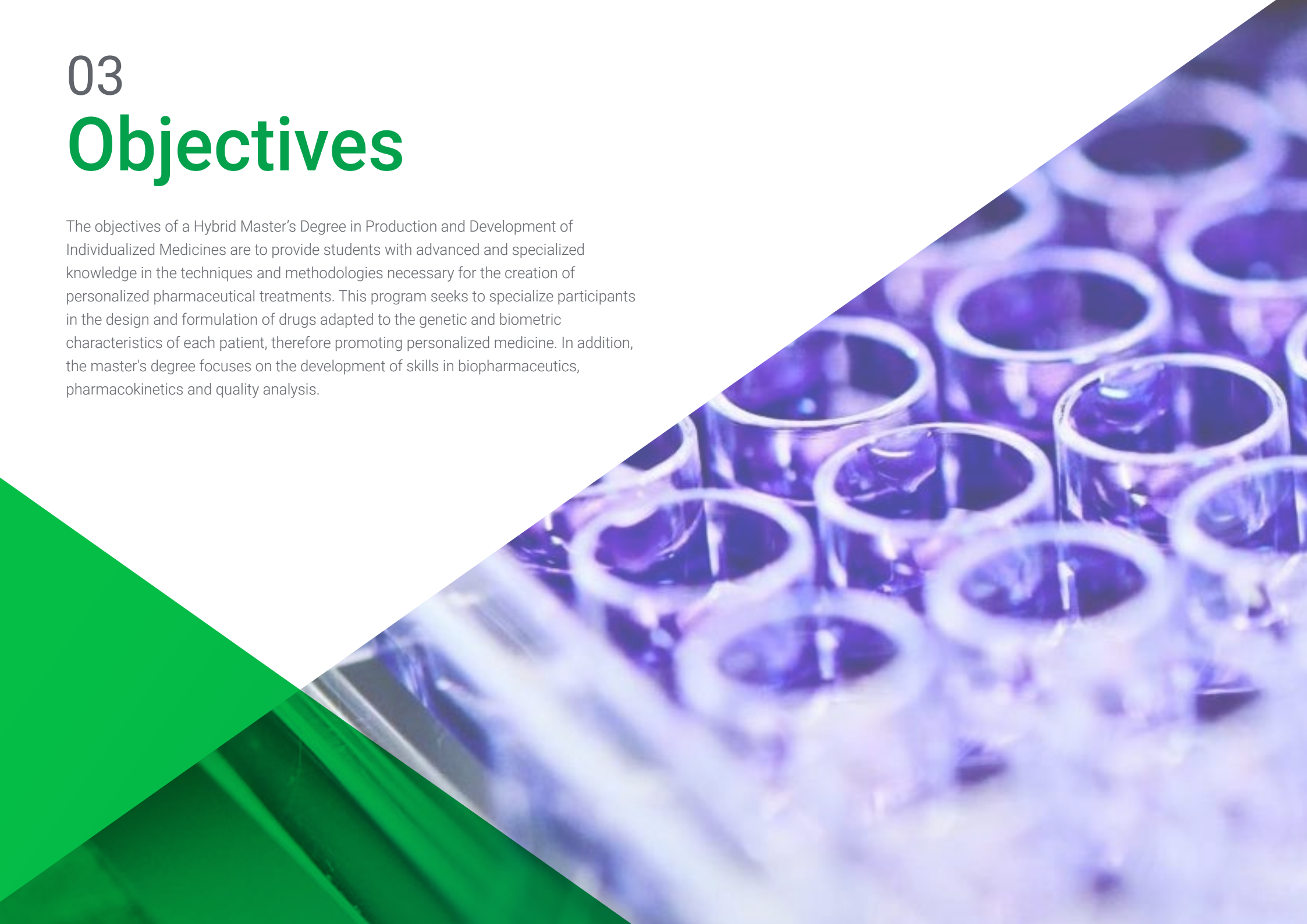
The innovative approach to individualized medicines, driven by advances in genome sequencing, Artificial Intelligence and 3D bioprinting, is enabling the development of more effective and safer therapies tailored to the unique characteristics of each patient. In fact, the growing demand for personalized treatments is creating an urgent need for professionals specialized in these advanced technologies, generating new opportunities for employment and specialization in areas such as Pharmacogenomics, Biotechnology and Bioinformatics.

You will have full practical immersion at the center of your choice"

03

Objectives

The objectives of a Hybrid Master's Degree in Production and Development of Individualized Medicines are to provide students with advanced and specialized knowledge in the techniques and methodologies necessary for the creation of personalized pharmaceutical treatments. This program seeks to specialize participants in the design and formulation of drugs adapted to the genetic and biometric characteristics of each patient, therefore promoting personalized medicine. In addition, the master's degree focuses on the development of skills in biopharmaceutics, pharmacokinetics and quality analysis.



You will apply theoretical knowledge in practical settings and meet the regulatory standards required in the pharmaceutical industry, through the best digital university in the world, according to Forbes"

General Objective

- The general objective of the Hybrid Master's Degree in Production and Development of Individualized Medicines will be to ensure that pharmacists acquire the necessary competencies for the correct elaboration of master formulas and office preparations, in accordance with current regulations. It will also update and strengthen the technical knowledge, practical skills and ethical attitudes required in the pharmaceutical sector, especially in the field of therapeutic personalization. In addition, graduates will be qualified to apply innovations in biopharmaceutics, pharmacokinetics and quality analysis, therefore ensuring the delivery of safe, effective and individually tailored to the individual needs of patients

The program will facilitate dynamic, up-to-date learning that will prepare professionals to lead in the field of individualized drug research and development"

Specific Objectives

Module 1. Biopharmaceutics and Pharmacokinetics

- Define the evolution of medicines in the body
- Explain the chemical, therapeutic and biological equivalence of medicines
- Define the principles of clinical pharmacokinetics
- Explain release as a limiting factor of absorption
- Explain the different absorption mechanisms
- Describe physiological factors influencing gastrointestinal absorption
- Explain the Physicochemical factors that limit absorption
- Describe the structure of the skin
- Define the factors that influence the absorption of substances through the skin
- Explain the differences between parenteral aqueous solutions and delayed parenteral solutions

Module 2. Basic Operations in the Production of Individualized Formulas

- Know the importance of formulation and objectives in spraying
- Delve into the rheological properties of plastics, exfoliable and elastic
- Differentiate the different filtration systems, delving into microfiltration and ultrafiltration
- Develop the wet and dry heat sterilization process

Module 3. Topical Pharmaceutical Dosage Forms

- Establish suitable laboratory conditions for product preparation
- Explain the registration of raw materials as well as the processing parts
- Explain the proper elaboration of the patient information leaflet
- Define the basic principles of packaging in master formulation
- Explain the quality control to be carried out in the preparation of pharmaceutical forms
- Explain the use of active ingredients for each of the pharmaceutical forms
- Explain the current legislation on the elaboration and quality control of master formulas and office preparations
- Explain resources and sources of consultation in the master formulation laboratory
- Describe the proper handling of the equipment
- Proper use of measurement systems
- Explain significant differences and peculiarities in the elaboration of different topical pharmaceutical forms
- Perform the operations entrusted with the elaboration and/or control according to the established norms of correct elaboration and quality control of master formulas and officinal preparation
- Make the corresponding records
- Explain what the emulsion sign consists of
- Explain what is involved in the testing of organoleptic characteristics, final weight/volume

Module 4. Liquid Dosage Forms for Oral Administration

- Explain the solubility and factors involved in the process of developing oral solutions
- Identify potential problems in developing oral solutions
- Explain the elaboration and indications of papers in master formulation
- Define the quality control to be followed in the production of suspensions and syrups
- Describe the application in pediatrics of liquid oral pharmaceutical forms
- Explain the application in geriatrics of liquid oral pharmaceutical forms

Module 5. Solid Dosage Forms for Oral Administration

- Explain the registration of raw materials as well as the processing parts
- Explain the proper elaboration of the patient information leaflet
- Define the basic principles of packaging in master formulation
- Explain the quality control to be carried out in the preparation of pharmaceutical forms
- Explain the use of active ingredients for each of the pharmaceutical forms
- Explain the current legislation on the elaboration and quality control of master formulas and officinal preparations

Module 6. Pharmaceutical Forms of Administration in Mucous Membranes

- Explain the correct weighing process in the Elaboration of Individualized Formulas
- Explain the correct spraying process and the tools to carry it out
- Define the factors influencing spraying
- Explain the rheological properties of the substances to be sprayed
- Explain the different screening procedures
- Describe the mixing and homogenization process
- Explain the types of sounds according to their humidity
- Define the different sterilization systems and their application
- Explain the different filtration systems and modes in master formulation
- List the stages of the freeze drying process

Module 7. Sterile Dosage Forms

- Define the concept of sterile in master formulation
- Explain the development of eye drops, as well as the tooling, regulations, etc.
- Describe the production of ophthalmic ointments, as well as the tooling, regulations, etc.
- Explain the development of sterile parenteral formulas in all its variants: intravenous, subcutaneous, intramuscular, etc.
- Describe the parenteral nutrition development process according to criteria of composition, quality, etc.
- Explain different sterilization systems and their characteristics
- Explain how to set expiration dates for sterile pharmaceutical forms
- List the most frequent pathologies with therapeutic vacuum in ophthalmology
- Explain the elaboration of an autologous serum

Module 8. Essential Oils in Master Formulation

- Know the essential oil extraction processes
- Develop the routes of administration of essential oils, both topically, orally and inhaled
- Study the most commonly used essential oils

Module 9. Excipients and Bases Used in Master Formulation

- Differentiate the different types of water used in master formulation
- Develop knowledge around simple excipients
- Delve into the bases of compound excipients

Module 10. Adjuvants in Individualized Formulation

- Explain the correct weighing process in the Elaboration of Individualized Formulas
- Explain the correct spraying process and the tools to carry it out
- Define the factors influencing spraying
- Explain the rheological properties of the substances to be sprayed
- Explain the different screening procedures
- Describe the mixing and homogenization process
- Explain the types of sounds according to their humidity
- Define the different sterilization systems and their application
- Explain the different filtration systems and modes in master formulation
- List the stages of the freeze drying process

Module 11. Basic Physical-Chemical Operations for Processing and Control of Products

- Perform the operations entrusted with the elaboration and/or control according to the established norms of correct elaboration and quality control of master formulas and officinal preparation
- Make the corresponding records
- Explain what the emulsion sign consists of
- Explain what is involved in the testing of organoleptic characteristics, final weight/volume

04

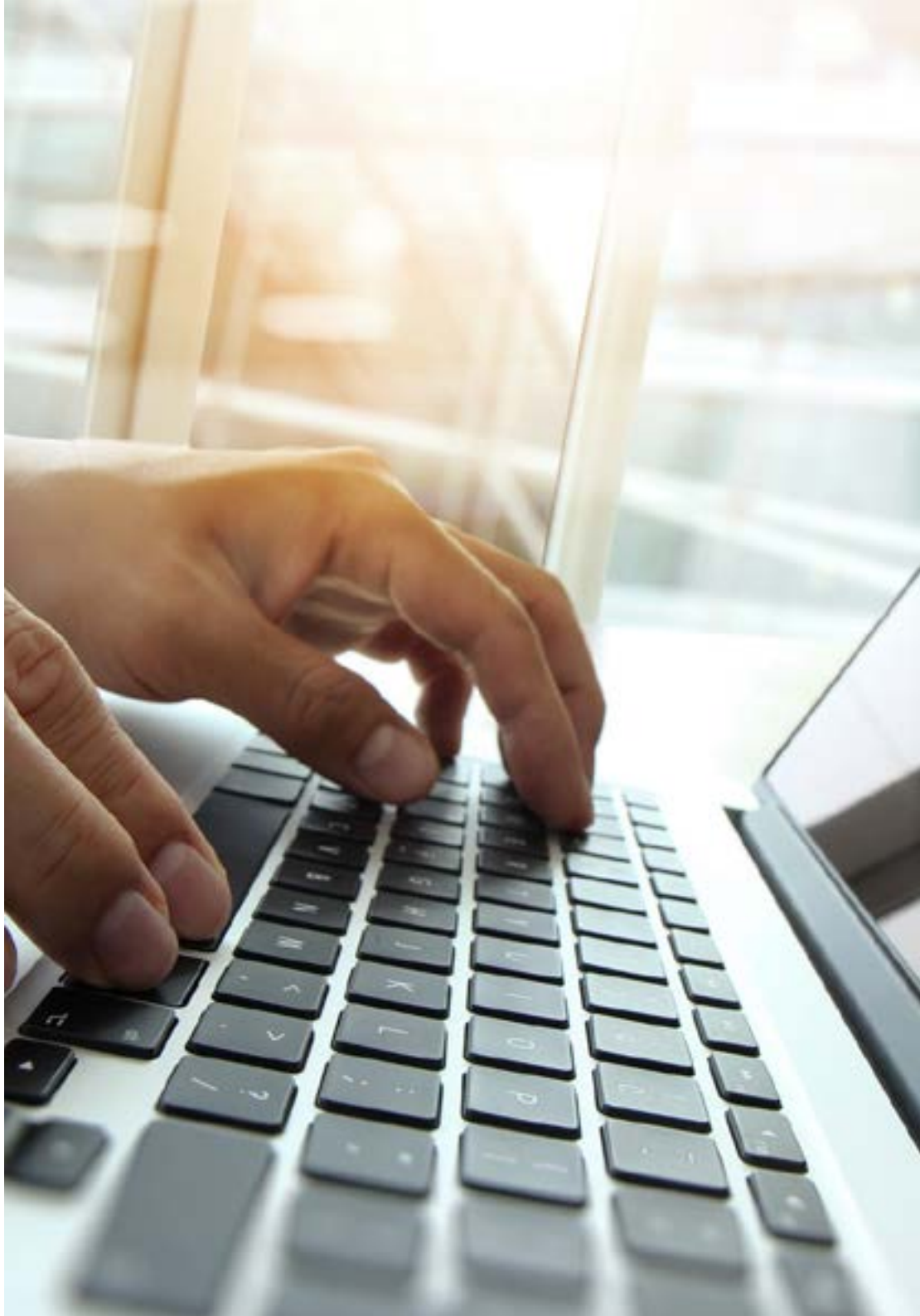
Skills

Pharmacists will develop specialized technical skills in the master formulation and preparation of personalized medicines, ensuring rigorous compliance with established regulations and quality standards. In addition, they will acquire updated knowledge in Biopharmacy and Pharmacokinetics, allowing them to understand how drugs interact with the body and how to optimize their therapeutic effectiveness. Therefore, this program will also emphasize the ability to analyze and evaluate the quality of pharmaceutical products, using advanced analytical methods.

You will be able to lead research and development projects in the creation of individualized treatments, therefore contributing to the advancement and innovation in personalized medicine"

General Skills

- Understand knowledge in such a way as to be able to generate issues or questions that are amenable to research
- Knowing how to apply knowledge with the ability to solve problem cases in daily practice situations
- Acquire the ability to communicate their findings clearly and unambiguously to patients and families
- Acquire the ability to clearly and concisely transmit their knowledge in clinical sessions or discussions with colleagues
- Acquire the ability to continue training autonomously



Specific Skills

- Define the needs and requirements to be able to produce an individualized medicine with the quality of an industrialized medicine
- Study and be able to respond to clinical situations where individualized formulation can be a solution
- Propose solutions to therapeutic gaps, shortages or withdrawal of medicines
- Explain the different pharmaceutical forms and their production, in order to provide solutions to possible therapeutic problems
- Update the knowledge for a correct production of the main master formulas (emulsions, capsules, syrups, etc.) reviewing: definitions, classifications, laboratory conditions, registration of raw materials, production reports, patient information leaflet, packaging, quality control, use of active ingredients etc. for each of the pharmaceutical forms
- preparation, patient information leaflet, packaging, quality control, use of active ingredients, etc. for each of the dosage forms
- Expand knowledge on the search for information and bibliographic documentation of consultation in the magistral formulation laboratory
- Develop skills in laboratory techniques: handling of tools and measuring systems; producing different topical and oral pharmaceutical forms: emulsions, ointments, solutions, suspensions, colloidal dispersions (gels), papers, capsules and powders
- Apply the norms, carry out the operations of production and/or control according to the established norms of correct production and quality control of master formulas and officinal preparations and make the corresponding records
- Perform complementary techniques for quality control of the finished formula: emulsion sign, organoleptic characteristics, final weight/volume

This Hybrid Master's Degree in Production and Development of Individualized Medicines will provide you with advanced skills in several key areas of the pharmaceutical sector"

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Course Management

The professors are highly qualified experts with vast experience in the pharmaceutical sector. In fact, these professionals not only possess in-depth knowledge in specific areas, such as master formulation, biopharmaceutics and pharmacokinetics, but are also committed to innovative and up-to-date teaching. In addition, their educational approach will focus on providing graduates with a comprehensive understanding of the latest techniques and methodologies in the personalization of pharmaceutical treatments, preparing them to meet the complex challenges of individualized drug development.

Faculty will foster a collaborative and participatory learning environment, where graduates will benefit from hands-on experience and professional guidance in the pharmaceutical industry"

Management

Dr. Sánchez Guerrero, Amelia

- Specialist in Hospital Pharmacy in the Community of Madrid
- Head of the Hospital Pharmacy Service at Puerta de Hierro Majadahonda University Hospital
- Head of Chemotherapy and other Treatments in the Day Hospital and Puerta de Hierro Majhonda University Hospital
- Head of the Clinical Trials Unit of the Pharmacy Service at Puerta de Hierro Majadahonda University Hospital
- Head of the Dispensing Unit at Puerta de Hierro Majadahonda University Hospital
- Associate Professor of the Faculty of Pharmacy at the Complutense University of Madrid
- Head of the Outpatient Pharmaceutical Care Unit at Carlos III Hospital
- Responsible for the Computerization of the Pharmacy Service at Obispo Polanco Hospital Teruel, Spain
- President of the Pharmacy and Therapeutics Commission at Puerta de Hierro Majadahonda University Hospital
- PhD from the Complutense University of Madrid
- Degree in Pharmacy from the Complutense University of Madrid

Professors

Dr. Santiago Prieto, Elvira

- Assistant Pharmacist at Puerta de Hierro Majadahonda University Hospital
- Responsible for the Area of Elaboration of Non-Hazardous Sterile Medicines, Non-Sterile and Nutrition of the Pharmacy Service at Puerta de Hierro Majadahonda University Hospital
- Specialist Pharmacist in Hospital Pharmacy, hired by the Foundation for Biomedical Research of Puerta de Hierro Majadahonda University Hospital
- Doctorate in Pharmacy from the Complutense University of Madrid
- Graduate in Pharmacy from the Complutense University of Madrid
- Master's Degree in Pharmaceutical Science with a Specialization in Community Pharmacy and Quality of Care from the Complutense University of Madrid

Dr. García Sanz, Elena

- Assistant to the Pharmacy Service at Puerta de Hierro Majadahonda University Hospital
- Specialist of the Hospital Pharmacy Service at Puerta de Hierro Majadahonda University Hospital
- Associate Professor of the 5th year of Pharmacy Internships at the Complutense University of Madrid
- Doctorate in Pharmacy from the Complutense University of Madrid
- Graduate in Pharmacy from the Complutense University of Madrid
- Master's Degree in Pharmaceutical Care in the Pharmaceutical Care Environment from the University of Valencia
- Member of: Purchasing Group of the General Subdirectorate of Pharmacy and Health Products of the Regional Ministry of Health

Ms. Rodríguez Marrodán, Belén

- Specialist in the Area of Hospital Pharmacy and Pharmacy Service at Puerta de Hierro Majadahonda University Hospital
- Tutor of Residents at Puerta de Hierro Majadahonda University Hospital
- Member of: Secretary of the Madrid Society of Hospital Pharmacists (SMFH), Member of the Medicines Committee of the Spanish Association of Pediatrics, Working Group on Safety in the Use of Medicines in Pediatrics at the Puerta de Hierro Majadahonda University Hospital, Member of the Clinical Research Ethics Committee (CEIm) at the Puerta de Hierro Majadahonda University Hospital and Working Group on Quality of Care and Patient Safety at the Spanish Society of Hospital Pediatrics
- Graduate in Pharmacy from the Complutense University of Madrid
- Specialist in Hospital Pharmacy by the Ministry of Education and Culture
- Diploma in Pharmaceutical Oncology from the University of Valencia

Ms. Gumiel Baena, Inés

- Pharmacist at the Puerta de Hierro Majadahonda University Hospital in Spain
- Master's Degree in Medical Devices from the University of Granada
- Specialist in Hospital Pharmacy at Puerta de Hierro Majadahonda University Hospital
- Graduate in Pharmacy from the Complutense University of Madrid

06

Educational Plan

From the basic fundamentals of individualized formulation to the practical application of regulations, the program will ensure a thorough understanding of how to design and prepare pharmaceutical treatments tailored to the specific needs of each patient. Therefore, pharmacists will delve into Biopharmaceutics and Pharmacokinetics to optimize the absorption and effectiveness of drugs, as well as master the essential technical operations in the preparation of personalized formulas. In addition, specific pharmaceutical forms will be analyzed, such as topical, oral liquid and solid administration, as well as the handling of sterile products and the use of essential oils and coadjuvants in formulation.

The content of this Hybrid Master's Degree in Production and Development of Individualized Medicines will cover a wide range of specialized areas in the pharmaceutical sector"

Module 1. Biopharmaceutics and Pharmacokinetics

1.1. New Aspects of Galenic Pharmacy
- 1.1.1. Introduction
- 1.1.2. Chemical, Therapeutic and Biological Equivalence of Medicines
- 1.1.3. Biopharmaceutics and Basic Pharmacokinetics
- 1.1.4. Pharmaceutic Technology
- 1.1.5. Clinical Pharmacokinetics

1.2. Evolution of Medicines in the Body
- 1.2.1. LADME
- 1.2.2. Kinetics of LADME Processes
- 1.2.3. Release as a Limiting Factor of Absorption

1.3. Absorption Mechanisms
- 1.3.1. Passive Diffusion
- 1.3.2. Convective Diffusion
- 1.3.3. Active Transport
- 1.3.4. Facilitated Transport
- 1.3.5. Ion Pairs
- 1.3.6. Pinocytosis

1.4. Routes of Administration
- 1.4.1. Oral
  - 1.4.1.1. Physiological Factors Affecting Gastrointestinal Absorption
  - 1.4.1.2. Physicochemical Factors Limiting Absorption
- 1.4.2. Topical Route
  - 1.4.2.1. Skin Structure
  - 1.4.2.2. Factors Influencing the Absorption of Substances Through the Skin
- 1.4.3. Parenteral Route
  - 1.4.3.1. Parenteral Aqueous Solutions
  - 1.4.3.2. Delayed Parenteral Solutions

Module 2. Basic Operations in the Production of Individualized Formulas

2.2. Spraying
- 2.2.1. Importance in the Formulation and Objectives
- 2.2.2. Spraying Equipment
  - 2.2.1.1. Manual
  - 2.2.1.2. Industrial
- 2.2.3. Factors that Affect Spraying
  - 2.2.3.1. Size
  - 2.2.3.2. Texture
- 2.2.4. Rheological Properties
  - 2.2.4.1. Plastics
  - 2.2.4.2. Exfoliables
  - 2.2.4.3. Elastic

2.3. Screening
- 2.3.1. Description
- 2.3.2. Sieves
- 2.3.3. Sieving Procedures

2.4. Mixing and Homogenization
- 2.4.1. Objectives
- 2.4.2. Types of Mixtures
- 2.4.3. Homogenization Process
- 2.4.4. Mixing Equipment

2.5. Filtration
- 2.5.1. Concept
- 2.5.2. Filtration Systems
- 2.5.3. Modes of Filtration
  - 2.5.3.1. Conventional Filtration
  - 2.5.3.2. Microfiltration
  - 2.5.3.3. Ultrafiltration
  - 2.5.3.4. Reverse Osmosis
  - 2.5.3.5. Sterilizing Filtration
  - 2.5.3.6. Tangential Filtration

2.6. Drying
- 2.6.1. Types of Sounds According to their Humidity
- 2.6.2. Midwives in Drying
- 2.6.3. The Drying Process
- 2.6.4. Devices for Drying
- 2.6.5. Freeze-Drying
  - 2.6.5.1. Stages of the Freeze Drying Process
  - 2.6.5.2. Applications

2.7. Sterilization
- 2.7.1. Heat Sterilization
  - 2.7.1.1. Humid Heat
  - 2.7.1.2. Dry Heat
- 2.7.2. Sterilization by Filtration
- 2.7.3. Other Types of Sterilization

Module 3. Topical Pharmaceutical Dosage Forms

3.1. Solutions
- 3.1.1. Aqueous Solutions
- 3.1.2. Alcoholic Solutions
- 3.1.3. Hydroalcoholic Solutions
- 3.1.4. Liposome Solutions or Liposomes
  - 3.1.4.1. Liposomes and Types
  - 3.1.4.2. Composition of Liposomes
  - 3.1.4.3. Functions of Liposomes
  - 3.1.4.4. Production of Liposomes Pharmacy and Industry
  - 3.1.4.5. Quality Control
- 3.1.5. Foams
- 3.1.6. Problems in the Production of Solutions

3.2. Emulsions
- 3.2.1. Definition
- 3.2.2. Emulsion Components
- 3.2.3. Types of Emulsifiers
- 3.2.4. Production
- 3.2.5. HLB Balance
- 3.2.6. Quality Control
- 3.2.7. Problems and Solutions in the Production Process

3.3. Gels
- 3.3.1. Mechanisms for Elaborating a Gel
- 3.3.2. Classification of Gelling Substances
- 3.3.3. Quality Control
- 3.3.4. Problems and Solutions in the Production Process

3.4. Ointments and Pastes
- 3.4.1. Definition
- 3.4.2. Types
- 3.4.3. Quality Control
- 3.4.4. Problems and Solutions in Paste Processing

3.5. Transdermal Creams
- 3.5.1. Definition
- 3.5.2. Mechanism of Action
- 3.5.3. Most Common Active Ingredients in Transdermals
- 3.5.4. Production
  - 3.5.4.1. PLO Gel
  - 3.5.4.2. PEN Type TD Creams
- 3.5.5. Uses
  - 3.5.5.1. Palliative Pain Therapy
  - 3.5.5.2. HRT Therapy
- 3.5.6. Quality Control

3.6. Application in Dermatology of Pharmaceutical Forms for Topical Administration
- 3.6.1. Skin Structure and Functions
  - 3.6.1.1. Epidermis
  - 3.6.1.2. Dermis
  - 3.6.1.3. Hypodermis
- 3.6.2. Common Pathologies
- 3.6.3. Master Formulas Frequently Used in Dermatology

3.7. Application in Podiatry of Pharmaceutical Forms for Topical Administration
- 3.7.1. The Foot
- 3.7.2. Common Pathologies
- 3.7.3. Master Formulas Frequently Used in Podiatry

3.8. Application in Otorhinology of Pharmaceutical Forms for Topical Administration
- 3.8.1. Introduction
- 3.8.2. Common Pathologies
- 3.8.3. Master Formulas Frequently Used in Otorhinology

Module 4. Liquid Dosage Forms for Oral Administration

4.1. Oral Solutions
- 4.1.1. Solubility and Factors Involved in this Process
- 4.1.2. Solvents
- 4.1.3. Production
- 4.1.4. Quality Control
- 4.1.5. Potential Problems in Production

4.2. Suspensions and Syrups
- 4.2.1. Important Aspects
- 6.2.2. Production
- 4.2.3. Quality Control

4.3. Sachets
- 4.3.1. Production

4.4. Application in Pediatrics of Liquid Oral Pharmaceutical Forms
- 4.4.1. Common Pathologies
- 4.4.2. Common Master Formulas

4.5. Application in Geriatrics of Liquid Oral Pharmaceutical Forms
- 4.5.1. Common Pathologies
- 4.5.2. Common Master Formulas

Module 5. Solid Dosage Forms for Oral Administration

5.1. Capsules
- 5.1.1. Definition and General Aspects
- 5.1.2. Types
  - 5.1.2.1. Hard Gelatin Capsules
  - 5.1.2.2. Soft Gelatin Capsules
  - 5.1.2.3. Gastroresistant Capsules
- 5.1.3. Production of Capsules
- 5.1.4. Excipients Capsules

5.2. Tablets I
- 5.2.1. Definition
- 5.2.2. Types
- 5.2.3. Advantages and Disadvantages
- 5.2.4. Preformulation and Property Analysis
- 5.2.5. Flow Properties
- 5.2.6. Formulation
  - 5.2.6.1. Types of Excipients
    - 5.2.6.1.1. Diluents
    - 5.2.6.1.2. Binders
    - 5.2.6.1.3. Disintegrants
    - 5.2.6.1.4. Lubricants
  - 5.2.6.2. Direct Compression Excipients
    - 5.2.6.2.1. Cellulose Derivatives
    - 5.2.6.2.2. Starch Derivatives
    - 5.2.6.2.3. Sugars
    - 5.2.6.2.4. Mineral Products
- 5.2.7. Compression Methods
  - 5.2.7.1. Wet Granulation
    - 5.2.7.1.1. Advantages and Disadvantages
    - 5.2.7.1.2. Granulation and Compression Process
  - 5.2.7.2. Dry Granulation
    - 5.2.7.2.1. Advantages and Disadvantages
    - 5.2.7.2.2. Features
  - 5.2.7.3. Direct Compression
    - 5.2.7.3.1. Advantages and Disadvantages
    - 5.2.7.3.2. Compression Process
- 5.2.8. Quality Control
- 5.2.9. Compression Machines
  - 5.2.9.1 Types
    - 5.2.9.1.1. Eccentric Compression Machines
    - 5.2.9.1.2. Rotary Compression Machines

5.3. Tablets II

Module 6. Pharmaceutical Forms of Administration in Mucous Membranes

6.1. Oral Mucosa
- 6.1.1. Features
- 6.1.2. Pathologies

6.2. Application in Dentistry
- 6.2.1. Introduction
- 6.2.2. Common Pathologies
- 6.2.3. Common Master Formulas

6.3. Vaginal Mucosa
- 6.3.1. Features
- 6.3.2. Ovules
  - 6.3.2.1. Production
  - 6.3.2.2. Excipients
  - 6.3.2.3. Quality Control
- 6.3.3. Pathologies
- 6.3.4. Usual Master Formulas in Gynecology

6.4. Rectal Mucosa
- 6.4.1. Enemas
  - 6.4.1.1. Production
  - 6.4.1.2. Excipients
  - 6.4.1.3. Quality Control
- 6.4.2. Suppositories
  - 6.4.2.1. Production
  - 6.4.2.2. Excipients
  - 6.4.2.3. Quality Control
- 6.4.3. Enemas
  - 6.4.3.1. Production
  - 6.4.3.2. Excipients
  - 6.4.3.3. Quality Control
- 6.4.4. Suppositories and Vaginal Ovules
  - 6.4.4.1. Production
  - 6.4.4.2. Excipients
  - 6.4.4.3. Quality Control

Module 7. Sterile Dosage Forms

7.1. Definition of Sterile in Master Formulation
7.2. Expiration Dates of Sterile Dosage Forms
    7.2.1. Protocols for Producing Sterile Products
    7.2.1.1. Work GP
    7.2.1.2. Microbiological Control SOPs
    7.2.1.3. Lyophilization Protocol
7.3. Sterilization
    7.3.1. Heat Sterilization
    7.3.1.1. Humid Heat
    7.3.1.2. Dry Heat
    7.3.1.2.1. Sterilization of Oils
    7.3.1.2.2. Sterilization of Glass Materials
    7.3.1.2.3. Tindalization
    7.3.2. Sterilization by Filtration
    7.3.2.1. Types of Filtration
    7.3.3. Other Types of Sterilization
    7.3.4. Disinfectants
    7.3.4.1. Most Frequent Disinfectants
7.4. External Sterile Pharmaceutical Forms Eye Drops and Ointments
7.5. Internal Sterile Pharmaceutical Forms Parenterals and Freeze-Dried

Module 8. Essential Oils in Master Formulation

8.1. Definition of Essential Oil Extraction Processes
    8.1.1. Extraction Process
8.2. Quality Criteria. Concept of Chemotype Identification Method (Chromatography and Mass Spectrophotometer)
    8.2.1. Concept of Chemotype
    8.2.2. Method of Identification
    8.2.2.1. Chromatography
    8.2.2.2. Mass Spectrophotometry

8.3. Instructions for Use of Essential Oils Pharmaceutical Forms and Routes of Administration Precautions and Contraindications Special Recommendations in Pregnancy and Lactation
8.3.1. Topical Route
8.3.2. Oral
8.3.3. By Inhalation
8.4. Essential Oils Most Commonly Used Topically
8.4.1. Pregnancy and Breastfeeding
8.4.2. Pediatrics
8.5. Essential Oils Most Commonly Used Orally
8.5.1. Exotic Basil (Ocinum Basilicum)
8.5.2. Provence Cypress (Cupressus Sempervivens Var. Strict)
8.5.3. Ginger (Zingiber Officinale)
8.5.4. Lavender (Lavándula Angustifolia)
8.5.5. Lemon (Citrus Limón)
8.5.6. Roman Chamomile (Chamaemelum Nobile)
8.5.7. Compact Oregano (Origanum Compactum)
8.6. Essential Oils Most Commonly Used Via Inhalation and Diffuser
8.7. Formulas Most Commonly Used in Dermatology Dilution Percentages, Vegetable Oils as Excipients or Coadjuvants Podiatry
8.8. Master Formulas with Essential Oils Frequently Used in Veterinary Medicine
8.9. Master Formulas with Essential Oils Frequently Used in Gynecology

Module 9. Excipients and Bases Used in Master Formulation

9.1. Water, the Most Commonly Used Excipient
9.1.1. Types of Water Used in Master Formulation
9.1.1.1. Purified Water
11.1.1.2. Water for Injectables
9.1.2. Procurement
9.2. Simple Excipients
9.2.1. Non-Aqueous Excipients
9.2.2. Other Commonly Used Excipients
9.2.3. Excipients of Obligatory Declaration
9.3. Compound Excipients
9.3.1. Solid Oral Forms
9.3.2. Liquids Oral Forms
9.3.3. Compound Bases

Module 10. Adjuvants in Individualized Formulation

10.1. Preservatives
10.1.1. Antioxidants
10.1.1. Antimicrobials:
10.2. Expiration of Master Formulas
10.3. Correctors of Organoleptic Characteristics of a Formula
10.3.1. Flavorings
10.3.2. Aromatizers
10.3.3. Dyes

Module 11. Basic Physical-Chemical Operations for Processing and Control of Products

11.1. Volume Measurement Units, Volumetric Material, Calibration, Cleaning and Recommendations for Use
11.2. Determination of Mass: Mass Units, Scales and Weighing Methods Verification and Calibration
11.3. Concentration: Concept and Expression Units.
11.4. Dilution Techniques Realization and Calculations
11.5. Density: Concept, Determination and Applications
11.6. Temperature Measurement
11.7. Viscosity: Concept, Determination and Applications
11.8. Melting Point: Concept and Determination
11.9. Solidification Point: Concept and Determination
11.10. Determination of pH Fundamental Concepts

07

Clinical Internship

After passing the online theoretical period, the program includes a practical specialization period in a reference pharmacological laboratory. Therefore, graduates will have at their disposal the support of an individual tutor who will accompany them throughout the process, giving them 100% of their time, both in the preparation and in the development of the clinical practices.

You will be prepared to lead research and development projects in the dynamic field of individualized medicine, designing pharmaceutical products that are tailored to specific needs"

The Internship Program period of this Production and Development of Individualized Medicines program is made up of a practical stay in a prestigious pharmaceutical laboratory, lasting 3 weeks, from Monday to Friday, with 8 consecutive hours of practical specialization alongside an associate specialist. In this way, this internship will allow graduates to work with real drugs and pharmaceutical product development tools, alongside a team of reference professionals in this area, applying the most innovative procedures and planning a state-of-the-art treatment, according to the individual needs of each patient.

In this totally practical specialization proposal, the activities are aimed at developing and perfecting the necessary competencies for the Production and Development of Individualized Medicines, which require a high level of qualification, and are oriented to the specific qualification for the exercise of the activity, in a high professional performance.

It is undoubtedly an opportunity to learn by working in a unique environment, equipped with the latest technology in the field of the Production and Development of Individualized Medicines. Therefore, this new way of understanding and integrating the processes of personalized medicine will turn a reference center into the ideal teaching scenario for this innovative experience in the improvement of professional skills.

The practical teaching will be carried out with the accompaniment and guidance of the professors and other fellow trainees who facilitate teamwork and multidisciplinary integration as transversal skills for medical practice (learning to be and learning to relate).

The procedures described below will be the basis of the specialization, and their realization will be subject to the center's own availability, its usual activity and workload, the proposed activities being the following:

Module	Practical Activity
Research and Development	Research new molecules and compounds for personalized therapies
	Conduct preclinical studies to evaluate efficacy and safety of individualized treatments
	Design experimental protocols to optimize pharmaceutical formulations
	Review and analyze scientific literature relevant to the field
Laboratory and Analysis	Perform detailed physicochemical analysis of pharmaceutical samples
	Conduct microbiological tests to assess contamination and efficacy of preservatives
	Optimize analytical methods to improve accuracy and reproducibility
	Validate analytical methods in accordance with current regulations
Technology and Equipment	Operate advanced equipment for elemental and isotope analysis
	Use 3D bioprinting systems for the manufacture of personalized drugs
	Maintain and calibrate laboratory equipment to ensure its proper functioning
	Manage and control the quality of pharmaceutical materials and products

Module	Practical Activity
Documentation and Regulatory Compliance	Prepare technical and regulatory documentation for submissions to health authorities
	Write scientific reports and research reports
	Conduct internal and external audits to ensure compliance with GMP regulations
	Maintain accurate and up to date records of all laboratory procedures and results
Interdisciplinary Collaboration	Work in multidisciplinary teams to integrate genomic and clinical data in the design of personalized treatments
	Participate in scientific meetings and discussions to share and discuss results and advances
	Collaborate with other departments (e.g. marketing, sales, etc.) to understand and meet market needs
	Effectively communicate findings and results to supervisors and colleagues in different areas

Specialize in a pharmaceutical laboratory that will offer you all the possibilities you are looking for, thanks to an innovative academic program and a team capable of developing your potential to the fullest"

Civil Liability Insurance

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this entity commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical training period. That way professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.

General Conditions of the Internship Program

The general terms and conditions of the internship agreement for the program are as follows:

1. TUTOR: During the Hybrid Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

2. DURATION: The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

3. ABSENCE: If the students does not show up on the start date of the Hybrid Master's Degree, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

4. CERTIFICATION: Professionals who pass the Hybrid Master's Degree will receive a certificate accrediting their stay at the center.

5. EMPLOYMENT RELATIONSHIP: the Hybrid Master's Degree shall not constitute an employment relationship of any kind.

6. PRIOR EDUCATION: Some centers may require a certificate of prior education for the Hybrid Master's Degree. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

7. DOES NOT INCLUDE: The Hybrid Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed.

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

08

Where Can I Do the Clinical Internship?

This Internship Program includes in its itinerary a practical stay in a prestigious pharmacological laboratory, where students will put into practice everything they have learned in the field of Production and Development of Individualized Medicines. In this sense, and in order to bring this program closer to more professionals, TECH offers graduates the opportunity to take it in different centers around the country. In this way, this institution strengthens its commitment to quality and affordable education for all.

You will carry out your practical stay in a prestigious pharmacological laboratory, to test everything you have learned with the best professionals in the sector"

The student will be able to complete the practical part of this Hybrid Master's Degree at the following centers:

Infarmade

Country
Spain

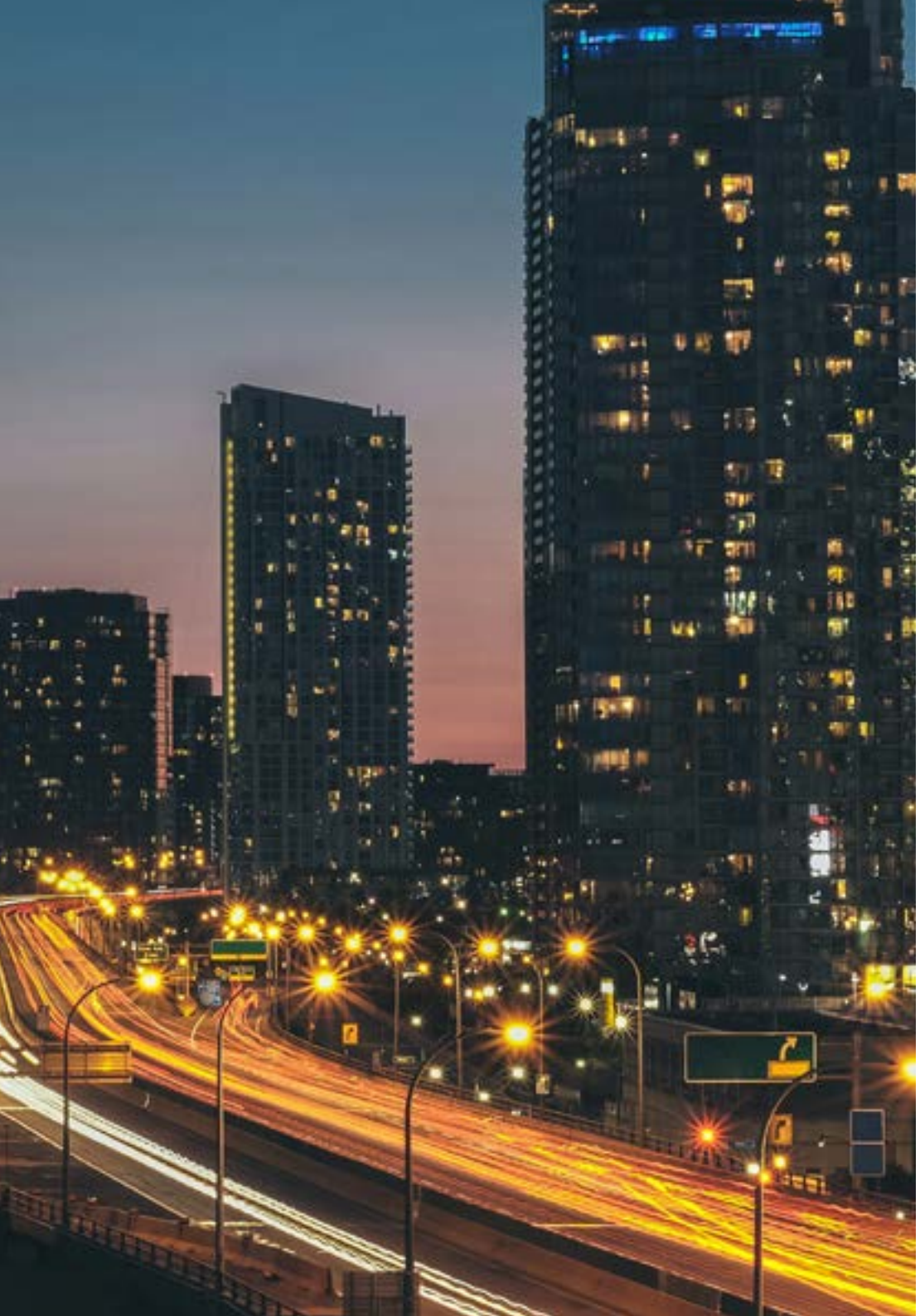
City
Seville

Address: C. Torre de los Herberos, 35, 41700, Dos Hermanas, Sevilla

Infarmade is a pharmacological laboratory founded by professors and researchers from the University of Seville.

Related internship programs:

-Production and Development of Individualized Medicines



Boost your career path with holistic teaching, allowing you to advance both theoretically and practically"

09

Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will be confronted with multiple simulated clinical cases based on real patients, in which they will have to investigate, establish hypotheses and ultimately, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Pharmacists learn better, more quickly and more sustainably over time.

With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.

According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, attempting to recreate the actual conditions in a pharmacist's professional practice.

Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"

The effectiveness of the method is justified by four fundamental achievements:

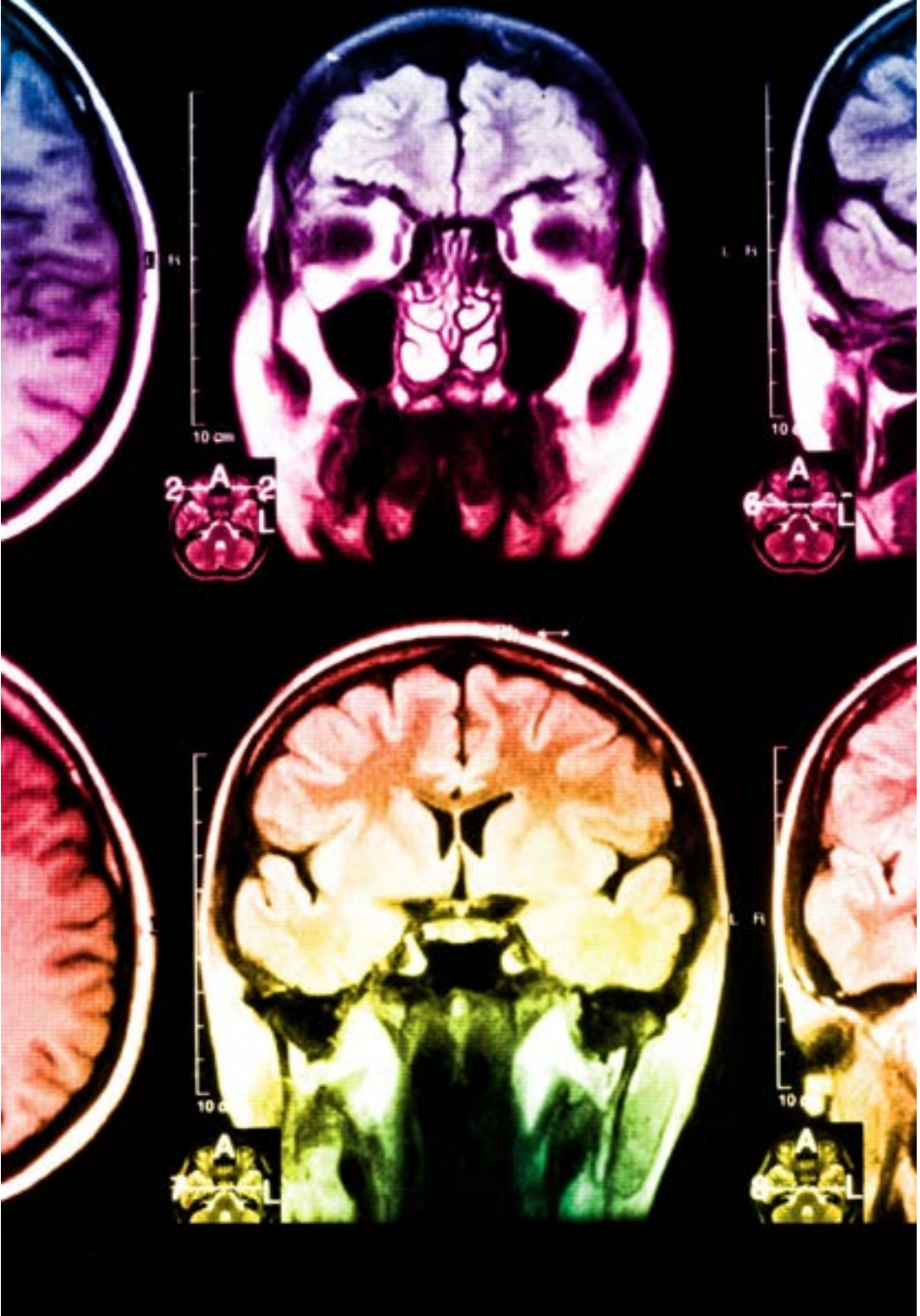
1. Pharmacists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

Our University is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, which represent a real revolution with respect to simply studying and analyzing cases.

Pharmacists will learn through real cases and by solving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 115,000 pharmacists have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. This pedagogical methodology is developed in a highly demanding environment, with a university student body with a high socioeconomic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.

This program offers the best educational material, prepared with professionals in mind:

Study Material

All teaching material is created specifically for the course by specialist pharmacists who will be teaching the course, so that the didactic development is highly specific and accurate.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

Video Techniques and Procedures

TECH introduces students to the latest techniques, to the latest educational advances, to the forefront of current pharmaceutical care procedures. All of this, first hand, and explained and detailed with precision to contribute to assimilation and a better understanding. And best of all, you can watch them as many times as you want.

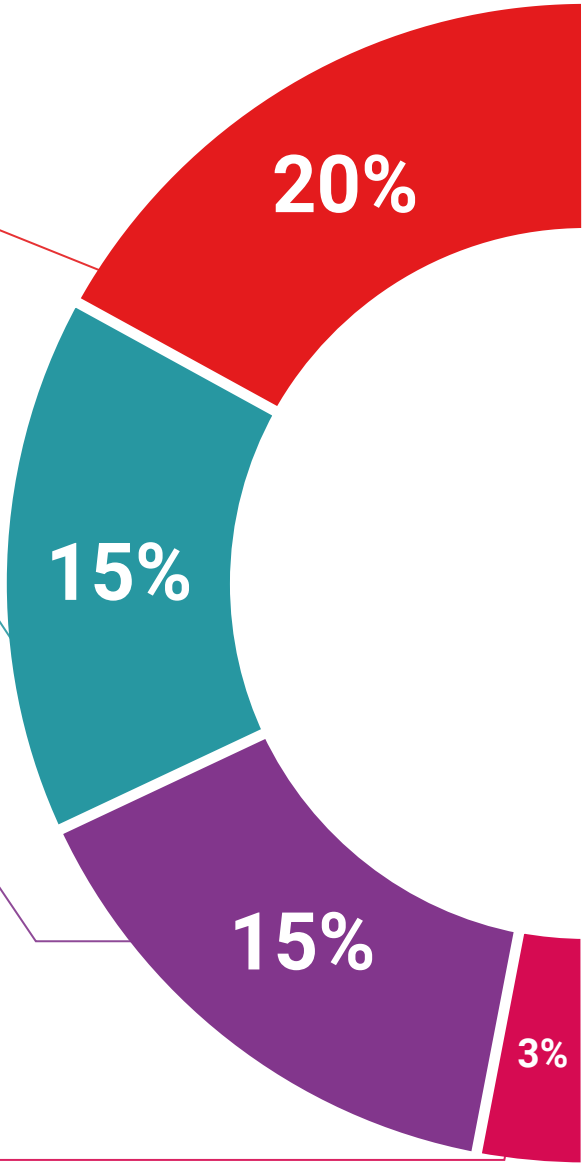
Interactive Summaries

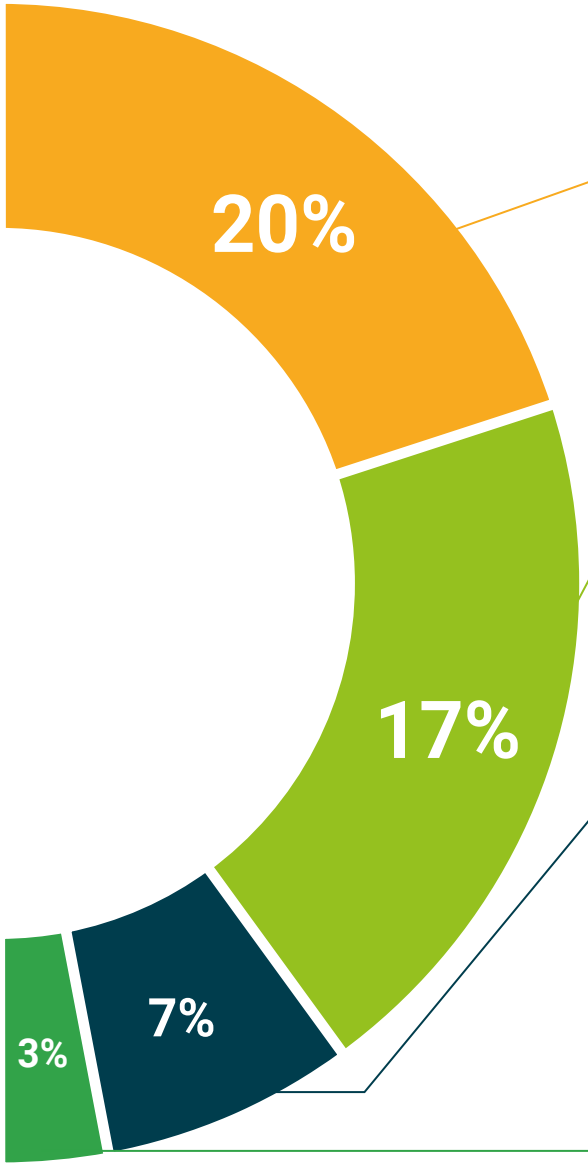
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".

Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, we will present you with real case developments in which the expert will guide you through focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.

Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

Classes

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.

10

Certificate

The Hybrid Master's Degree in Production and Development of Individualized Medicines guarantees students, in addition to the most rigorous and up-to-date education, access to a Hybrid Master's Degree issued by TECH Global University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"

This private qualification will allow you to obtain a **Hybrid Master's Degree in Production and Development of Individualized Medicines** endorsed by **TECH Global University**, the world's largest online university.

TECH Global University is an official European University publicly recognized by the Government of Andorra (***official bulletin***). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Hybrid Master's Degree in Production and Development of Individualized Medicines**

Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Accreditation: **60 + 4 ECTS**


tech global university

Mr./Ms. _____ with identification document _____
has successfully passed and obtained the title of:

Hybrid Master's Degree in Production and Development of Individualized Medicines

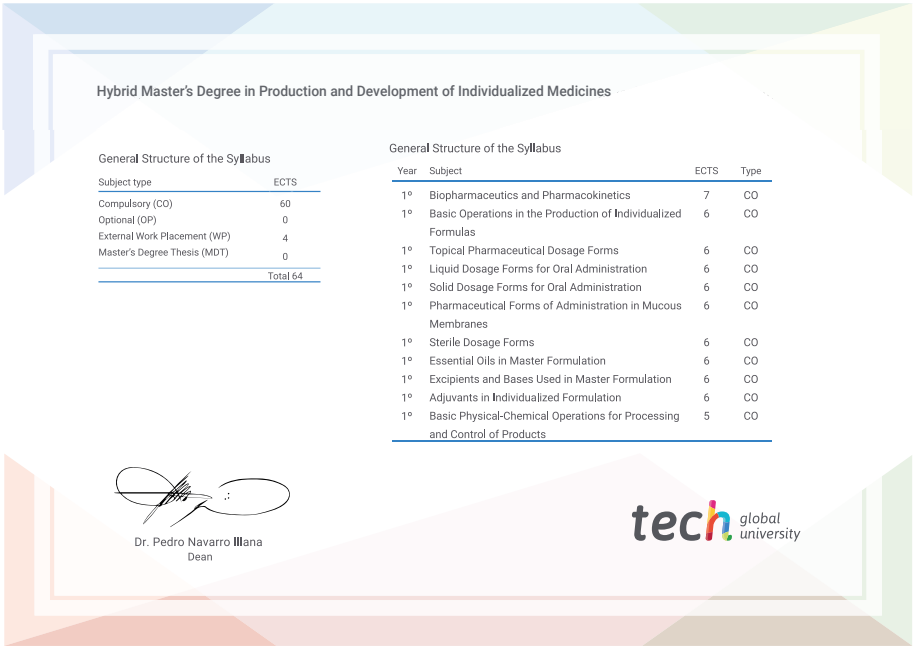
This is a private qualification of 1,920 hours of duration equivalent to 64 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates


Hybrid Master's Degree in Production and Development of Individualized Medicines

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	4
Master's Degree Thesis (MDT)	0
	Total 64

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Biopharmaceutics and Pharmacokinetics	7	CO
1º	Basic Operations in the Production of Individualized Formulas	6	CO
1º	Topical Pharmaceutical Dosage Forms	6	CO
1º	Liquid Dosage Forms for Oral Administration	6	CO
1º	Solid Dosage Forms for Oral Administration	6	CO
1º	Pharmaceutical Forms of Administration in Mucous Membranes	6	CO
1º	Sterile Dosage Forms	6	CO
1º	Essential Oils in Master Formulation	6	CO
1º	Excipients and Bases Used in Master Formulation	6	CO
1º	Adjuvants in Individualized Formulation	6	CO
1º	Basic Physical-Chemical Operations for Processing and Control of Products	5	CO

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*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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Hybrid Master's Degree

Production and Development of Individualized Medicines

Modality: **Hybrid (Online + Clinical Internship)**
Duration: **12 months**
Certificate: **TECH Global University**
Accreditation: **60 + 4 ECTS**

Hybrid Master's Degree

Production and Development of Individualized Medicines

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