



Postgraduate Diploma Tools for Health Research

» Modality: online

» Duration: 6 months

» Certificate: TECH Technological University

» Dedication: 16h/week

» Schedule: at your own pace

» Exams: online

 $We b site: {\color{blue}www.techtitute.com/in/pharmacy/postgraduate-diploma/postgraduate-diploma-tools-health-research} \\$

Index

> 06 Certificate

> > p. 28





tech 06 | Introduction

Incremental innovation justifies the scrutiny that some drugs undergo when they are marketed. In order to obtain the "flagship product", some societies have undervalued the pharmaceutical work in the market. On occasions, drugs that affected the health of individuals had to be removed from the market. An example of this is the temporary suspension of cerivastatin, at the request of the pharmaceutical laboratory Bayer, S.A., for causing kidney damage to those who consumed it.

In this sense, it is essential that pharmaceutical companies have personnel who have a thorough understanding of the action protocols, act under professional ethics and, above all, are constantly updated. To meet the qualification requirements in the labor market, TECH has developed a rigorous program that explores the management of clinical information, which is key to the management of the social and health field, as well as research and the publication of articles, theses and applied reports. In this way, specialists will increase their competitiveness in the labor market by gaining new knowledge about research.

It is a 100% online program that allows them to study the subject without neglecting other activities of the specialists' daily lives, such as their jobs. In addition, TECH applies the Relearning methodology to exempt students from long hours of memorization and allow them assimilating the contents in a gradual and constant manner. By taking this program, professionals will have the support of a teaching team of specialists who have been awarded several prizes in the health sector.

This **Postgraduate Diploma in Tools for Health Research** contains the most complete and up-to-date scientific program on the market. The most important features include:

- Development of practical case studies presented by experts in health sciences
- The graphic, schematic, and practical contents with which they are created, provide medical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies
- 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



The overall structure of a project is key to its performance. Learn about the correct generation of scientific studies to understand the level of impact of their backgrounds"



Now you can be part of the professionals at the forefront of studies in pharmaceutics, thanks to the theoretical-practical knowledge you will obtain with TECH"

The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will allow professionals to learn in a contextual and situated learning environment, i.e., a simulated environment that will provide immersive education programmed to prepare in real situations.

The design of this program focuses on Problem-Based Learning, by means of which professionals must try to solve the different professional practice situations that are presented to them throughout the academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

Master the ROC Curves and the types of multiple regression analysis to apply to your studies and offer a more accurate service.

Statistics and R are key in research in health sciences. Delve into this field managing population data and working with samples with guaranteed success.







tech 10 | Objectives



General Objectives

- Understand the appropriate approach to a question or problem to be solved
- Asses the state of the art of the problem through literature search
- Assess the feasibility of the potential project
- Study the drafting of a project in accordance with the different calls for proposals
- Examine the search for funding
- Master the necessary data analysis tools
- Write scientific articles (papers) for the daily magazines
- Generate posters relevant to the units covered
- Know the tools for dissemination to the non-specialized public
- Delve into data protection
- Understand the transfer of knowledge generated to industry or the clinic
- Examine the current use of artificial intelligence and massive data analysis
- Study examples of successful projects



Would you like to update your pharmaceutical knowledge to perform multivariate analysis with R? Enrich your professional career, thanks to the rigorous knowledge that you will get with TECH"







Specific Objectives

Module 1. Generation of Research Projects

- Learn how to assess the feasibility of the potential project
- Know in depth the essential milestones for writing a research project
- Delve into the criteria for exclusion/inclusion in projects
- Learn how to set up the specific team for each project

Module 2. Statistics and R in Health Research

- Describe the main concepts of biostatistics
- Learn how to use the R program
- Define and understand the regression method and multivariate analysis with R
- Recognize the concepts of statistics applied to research
- Describe the statistical techniques of Data Mining
- Provide knowledge of the most commonly used statistical techniques in biomedical research

Module 3. Graphical Representations of Data in Health Research and Other Advanced Analysis

- Master the tools of computational statistics
- Learn to generate graphs for the visual interpretation of data obtained in research project
- Delve into the dimensionality reduction methods
- Delve into the comparison of methods







tech 14 | Course Management

Management



Dr. López-Collazo, Eduardo

- Head of the Department of Immune Response and Infectious Diseases at IdiPAZ
- Head of the Department of Immune Response, Tumors and Immunology at IdiPAZ
- President of the IdiPAZ Research Commission
- Sponsor of the External Scientific Committee of the Murcian Institute of Health Research
- Member of the Scientific Commission of FIDE
- Editor of the international scientific journal "Mediators of Inflammation"
- Editor of the international scientific journal "Frontiers of Immunology"
- Coordinator of IdiPAZ Platforms
- Coordinator of Health Research Funds in the areas of Cancer, Infectious Diseases and HIV
- PhD in Nuclear Physics, University of La Habana
- Doctorate in Pharmacy from the Complutense University of Madric

Professors

Dr. Avendaño Ortiz, José

- "Sara Borrell" Researcher Foundation for Biomedical Research of the Ramón y Cajal University Hospital (FIBioHRC/IRyCIS)
- Researcher Foundation for Biomedical Research of La Paz University Hospital (FIBHULP/ IdiPAZ)
- Researcher HM Hospitals Foundation (FiHM)
- Graduate in Biomedical Sciences from the University of Lleida
- Master's Degree in pharmacological research from the Autonomous University of Madrid
- PhD in Pharmacology and Physiology from the Autonomous University of Madrid

Mr. Arnedo Abad, Luis

- Data & Analyst Manager
- Data Scientist & Analyst Manager in Industrias Arnedo
- Data & Analyst Manager in Boustique Perfumes
- Data Scientist & Analyst Manager in Darecod
- Postgraduate Certificate in Statistics
- Psychology Graduate

Dr. Pascual Iglesias, Alejandro

- Bioinformatics Platform Coordinator, La Paz Hospital
- Advisor to the COVID-19 Expert Committee of Extremadura
- Researcher in Eduardo López-Collazo's innate immune response research group, Instituto de Investigación Sanitaras University Hospital La Paz
- Researcher in the coronavirus research group of Luis Enjuanes, National Center of Biotechnology CNB-CSIC
- Coordinator of Continuing Education in Bioinformatics, Health Research Institute of the University Hospital La Paz
- Cum Laude Doctor in Molecular Biosciences from the Autonomous University of Madrid
- Degree in Biology Molecular from the University of Salamanca
- Professional Master's Degree in Cellular and Molecular Physiopathology and Pharmacology from the Universidad of Salamanca





tech 18 | Structure and Content

Module 1. Generation of Research Projects

- 1.1. General Structure of a Project
- 1.2. Presentation of Background and Preliminary Data
- 1.3. Definition of the Hypothesis
- 1.4. Definition of General and Specific Objectives
- 1.5. Definition of the Type of Sample, Number and Variables to be Measured
- 1.6. Establishment of the Scientific Methodology
- 1.7. Exclusion/Inclusion Criteria in Projects with Human Samples
- 1.8. Establishment of the Specific Team: Balance and Expertise
- 1.9. Expectations: An Important Element that we Forget
- 1.10. Budget Generation: A fine Tuning Between the Needs and the Reality of the Call
- 1.11. Ethical Aspects

Module 2. Statistics and R in Health Research

- 2.1. Biostatistics
 - 2.1.1. Introduction to The Scientific Method
 - 2.1.2. Population and Sample. Sampling Measures of Centralization
 - 2.1.3. Discrete Distributions and Continuous Distributions
 - 2.1.4. General Outline of Statistical Inference. Inference about a Normal Population Mean. Inference about a General Population Mean
 - 2.1.5. Introduction to Nonparametric Inference
- 2.2. Introduction to R
 - 2.2.1. Basic Features of the Program
 - 2.2.2. Main Object Types
 - 2.2.3. Simple Examples of Simulation and Statistical Inference
 - 2.2.4. Graphs
 - 2.2.5. Introduction to R Programming
- 2.3. Regression Methods with R
 - 2.3.1. Regression Models
 - 2.3.2. Variable Selection
 - 2.3.3. Model Diagnosis
 - 2.3.4. Treatment of Outliers
 - 2.3.5. Regression Analysis

- 2.4. Multivariate Analysis with R
 - 2.4.1. Description of Multivariate Data
 - 2.4.2. Multivariate Distributions
 - 2.4.3. Dimension Reduction
 - 2.4.4. Unsupervised Classification: Cluster Analysis
 - 2.4.5. Supervised Classification: Discriminant Analysis
- 2.5. Regression Methods for Research with R
 - 2.5.1. Generalized Linear Models (GLM): Poisson Regression and Negative Binomial Regression
 - 2.5.2. Generalized Linear Models (GLM): Logistic and Binomial Regressions
 - 2.5.3. Poisson and Negative Binomial Regression Inflated by Zeros
 - 2.5.1. Local Fits and Generalized Additive Models (GAMs)
 - Generalized Mixed Models (GLMM) and Generalized Additive Mixed Models (GAMM)
- 2.6. Statistics Applied to Biomedical Research with R I
 - 2.6.1. Basic Notions of R. Variables and Objects in R. Data handling. Files Graphs
 - 2.6.2. Descriptive Statistics and Probability Functions
 - 2.6.3. Programming and Functions in R
 - 2.6.4. Contingency Table Analysis
 - 2.6.5 Basic Inference with Continuous Variables
- 2.7. Statistics Applied to Biomedical Research with R II
 - 2.7.1. Analysis of Variance
 - 2.7.2. Correlation Analysis
 - 2.7.3. Simple Linear Regression
 - 2.7.4. Multiple Linear Regression
 - 2.7.5. Logistic Regression
- 2.8. Statistics Applied to Biomedical Research with R III
 - 2.8.1. Confounding Variables and Interactions
 - 2.8.2. Construction of a Logistic Regression Model
 - 2.8.3. Survival Analysis
 - 2.8.4. Cox Regression
 - 2.8.5. Predictive Models. ROC Curve Analysis



Structure and Content | 19 tech

- 2.9. Statistical Data Mining Techniques with R I
 - 2.9.1. Introduction. Data Mining. Supervised and Unsupervised Learning. Predictive Models. Classification and Regression
 - 2.9.2. Descriptive Analysis. Data Pre-Processing
 - 2.9.3. Principal Component Analysis (PCA)
 - 2.9.4. Cluster Analysis. Hierarchical Methods. K-Means
- 2.10. Statistical Data Mining Techniques with R II
 - 2.10.1. Model Assessment Measures. Predictive Ability Measures. ROC Curves
 - 2.10.2. Models Assessment Techniques. Cross-Validation. Bootstrap Samples
 - 2.10.3. Tree-Based Methods (CART)
 - 2.10.4. Support Vector Machines (SVM)
 - 2.10.5. Random Forest (RF) and Neural Networks (NN)

Module 3. Graphical Representations of Data in Health Research and Other Advanced Analysis

- 3.1. Types of Graphs
- 3.2. Survival Analysis
- 3.3. ROC Curves
- 3.4. Multivariate Analysis (Types of Multiple Regression)
- 3.5. Binary Regression Models
- 3.6. Massive Data Analysis
- 3.7. Dimensionality Reduction Methods
- 3.8. Comparison of Methods: PCA, PPCA and KPCA
- 3.9. T-SNE (t-Distributed Stochastic Neighbor Embedding)
- 3.10. UMAP (Uniform Manifold Approximation and Projection)



A program designed to master your skills and obtain innovative techniques and strategies in the field of research"

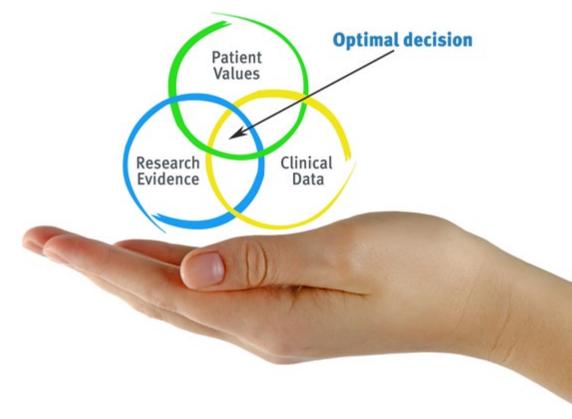


tech 22 | Methodology

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.



tech 24 | Methodology

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.



Methodology | 25 tech

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.

tech 26 | Methodology

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

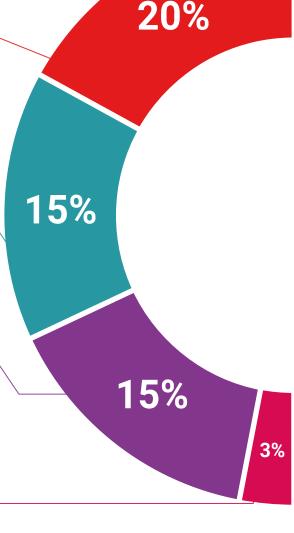
TECH introduces students to the latest techniques, to the latest educational advances, to the forefront of current pharmaceutical care procedures. All of this, first hand, and explained and detailed with precision to contribute to assimilation and a better understanding. And best of all, you can watch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

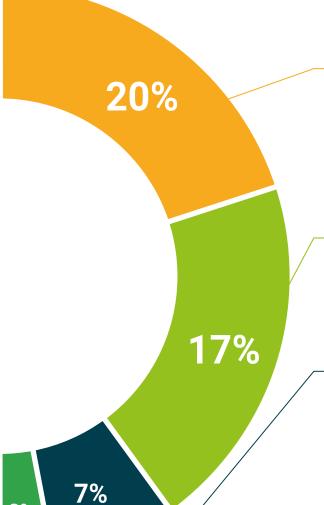
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".





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.







tech 30 | Certificate

This **Postgraduate Diploma in Tools for Health Research** contains the most complete and up-to-date scientific program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma**, issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: Postgraduate Diploma in Tools for Health Research
Official N° of Hours: **450 h**.



Mr./Ms._____, with identification number____ For having passed and accredited the following program

POSTGRADUATE DIPLOMA

in

Tools for Health Research

This is a qualification awarded by this University, equivalent to 450 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

une 17, 2020

Tere Guevara Navarro

his qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country

ue TECH Code: AFWORD23S techtitute.com/certifi

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