

# Master's Degree

## Artificial Intelligence in Nursing



## Master's Degree Artificial Intelligence in Nursing

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Accreditation: 90 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/artificial-intelligence/master-degree-/master-artificial-intelligence-nursing](http://www.techtute.com/us/artificial-intelligence/master-degree-/master-artificial-intelligence-nursing)

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# 01

# Introduction

Nursing supports multiple care, organizational and communicative processes that are essential to provide patients with the best care. However, in the healthcare environment, digitalized resources such as Artificial Intelligence (AI) tools that facilitate the remote monitoring of patients and other Telemedicine tasks are increasingly advancing and having a greater impact. Therefore, professionals in the sector will find in this TECH program an unparalleled academic opportunity to update their knowledge. A university program that brings together the latest trends, applications and protocols, based on AI, which are used today to optimize patient care. All this through a 100% online academic itinerary, without strict schedules for study and the teaching guidance of the best experts in the sector.



“

*A 100% online and comprehensive program with which you will delve into the key tools of Artificial Intelligence that can be applied in nursing practice”*

Nursing is one of the pillars of healthcare, since multiple care, organizational and communication processes depend on it, and it facilitates interdisciplinary work. Likewise, the advance of digitalization in clinical environments has led to nurses being required to have more and better skills to cope with the traditional tasks of the sector, at the same time as taking on new challenges. One of these challenges has been the incorporation of Artificial Intelligence into areas such as Telemedicine, the management of patient databases or to maximize the control of care inputs.

In this context, nurses are invited to update their skills and, at the same time, to develop broad profiles that allow them to access new job opportunities. From these demands arises the Master's Degree in Artificial Intelligence in Nursing from TECH. This comprehensive program covers innovative concepts on the use of new digital technologies, based on AI, to improve efficiency and patient care.

The curriculum delves into general topics on Artificial Intelligence tools and then has specific modules for nurses, where the applications of these resources are analyzed to address the Nutrition of patients, or monitor their recovery after any procedure. Therefore, after delving into all these contents, nurses will be able to lead digital health projects and develop personalized care, increasing their value for more competitive job opportunities.

At the same time, this program has a 100% online methodology with which nurses will have the ease of studying and at the same time continue their work or personal obligations. At the same time, the syllabus is accessible 24 hours a day, 7 days a week, from any device with an Internet connection, although it can also be downloaded. On the other hand, the teaching-learning process is based on the implementation of the Relearning method, which facilitates the assimilation of key concepts through repetition.

This **Master's Degree in Artificial Intelligence in Nursing** contains the most complete and up-to-date program on the market. The most important features include:

- The development of case studies presented by experts with a deep mastery of Artificial Intelligence tools that facilitate the work of nurses in clinics, hospitals and other care centers
- The graphic, schematic, and practical contents which provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where the self-assessment process can be carried out 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



*Get trained to adapt to technological changes in the healthcare field through this comprehensive program in Artificial Intelligence in Nursing"*

“

*As a nurse trained in AI applications, you will contribute to the development of technological innovation projects to improve the efficiency and accuracy of patient care”*

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

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

This program is designed around Problem-Based Learning, whereby the professional 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 experts in the field of educational coaching with extensive experience.

*You will expand your skills and knowledge about AI and its impact on nursing practice through the analysis of simulated real cases.*

*You will have the Relearning method, in which TECH is a pioneer, to address the key concepts of Artificial Intelligence in Nursing and assimilate them through repetition.*



# 02 Syllabus

The syllabus of this Master's Degree offers a complete tour from the basics of AI to APP tools specialized in health. In its modules, nurses will delve into areas such as the creation of personalized conversational assistants to optimize clinical care, the use of Virtual Reality in emotional support and rehabilitation, as well as other resources that allow them to personalize the care and monitoring of patients remotely. In addition, the entire curriculum has a disruptive teaching methodology, based on the reiteration of key concepts through a Relearning system and is taught 100% online.

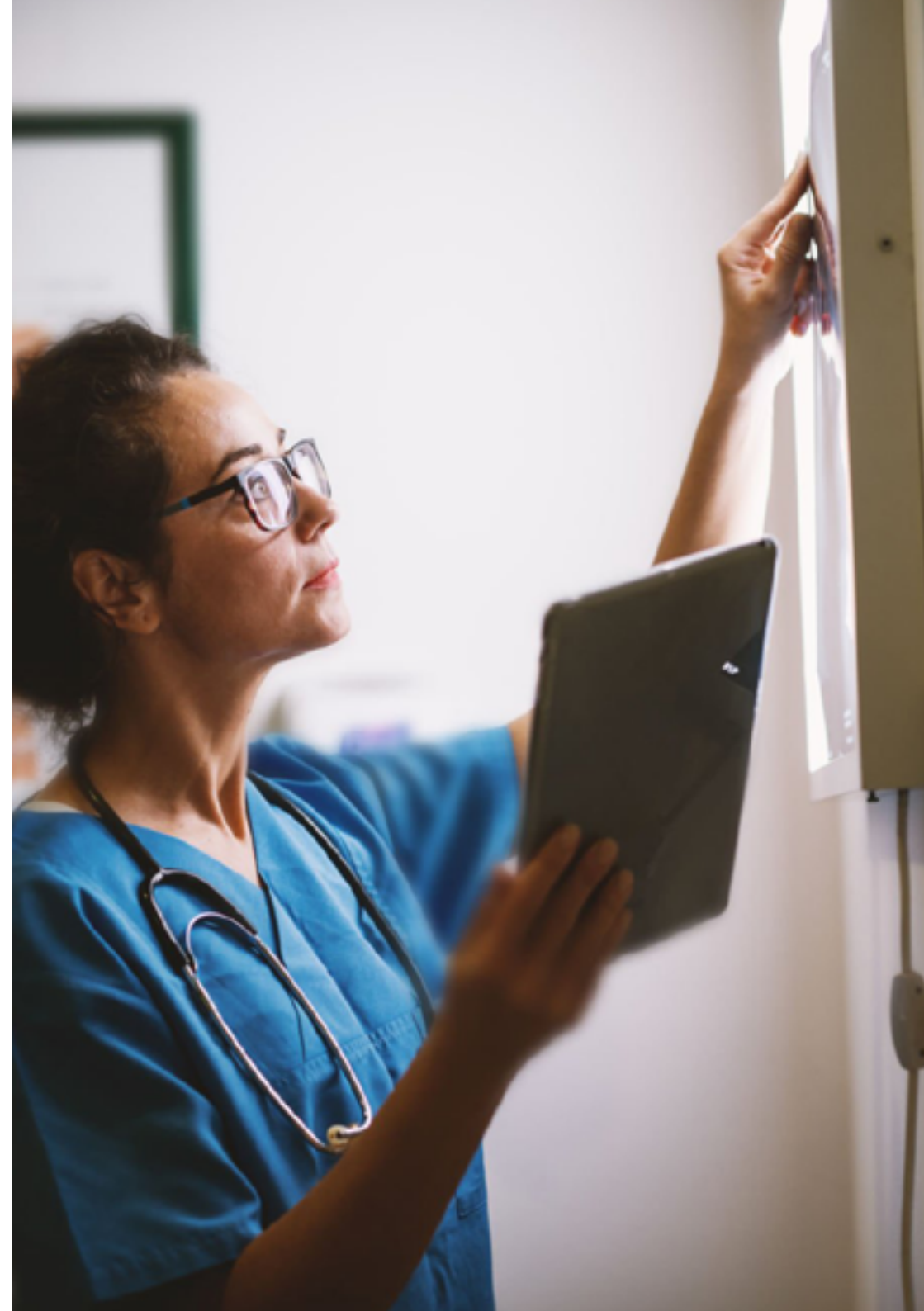


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*You will have at your disposal  
advanced multimedia resources, such  
as explanatory videos and interactive  
summaries, for your comprehensive  
training with this TECH program”*

## Module 1. Fundamentals of Artificial Intelligence

- 1.1. History of Artificial Intelligence
  - 1.1.1. When Do We Start Talking About Artificial Intelligence?
  - 1.1.2. References in Film
  - 1.1.3. Importance of Artificial Intelligence
  - 1.1.4. Technologies that Enable and Support Artificial Intelligence
- 1.2. Artificial Intelligence in Games
  - 1.2.1. Game Theory
  - 1.2.2. Minimax and Alpha-Beta Pruning
  - 1.2.3. Simulation: Monte Carlo
- 1.3. Neural Networks
  - 1.3.1. Biological Fundamentals
  - 1.3.2. Computational Model
  - 1.3.3. Supervised and Unsupervised Neural Networks
  - 1.3.4. Simple Perceptron
  - 1.3.5. Multilayer Perceptron
- 1.4. Genetic Algorithms
  - 1.4.1. History
  - 1.4.2. Biological Basis
  - 1.4.3. Problem Coding
  - 1.4.4. Generation of the Initial Population
  - 1.4.5. Main Algorithm and Genetic Operators
  - 1.4.6. Evaluation of Individuals: Fitness
- 1.5. Thesauri, Vocabularies, Taxonomies
  - 1.5.1. Vocabulary
  - 1.5.2. Taxonomy
  - 1.5.3. Thesauri
  - 1.5.4. Ontologies
  - 1.5.5. Knowledge Representation Semantic Web
- 1.6. Semantic Web
  - 1.6.1. Specifications: RDF, RDFS and OWL
  - 1.6.2. Inference/ Reasoning
  - 1.6.3. *Linked Data*



- 1.7. Expert Systems and DSS
  - 1.7.1. Expert Systems
  - 1.7.2. Decision Support Systems
- 1.8. Chatbots and Virtual Assistants
  - 1.8.1. Types of Assistants: Voice and Text Assistants
  - 1.8.2. Fundamental Parts for the Development of an Assistant: Intents, Entities and Dialog Flow
  - 1.8.3. Integrations: Web, Slack, WhatsApp, Facebook
  - 1.8.4. Assistant Development Tools: Dialog Flow, Watson Assistant
- 1.9. AI Implementation Strategy
- 1.10. Future of Artificial Intelligence
  - 1.10.1. Understand How to Detect Emotions Using Algorithms
  - 1.10.2. Creating a Personality: Language, Expressions and Content
  - 1.10.3. Trends of Artificial Intelligence
  - 1.10.4. Reflections

## Module 2. Data Types and Life Cycle

- 2.1. Statistics
  - 2.1.1. Statistics: Descriptive Statistics, Statistical Inferences
  - 2.1.2. Population, Sample, Individual
  - 2.1.3. Variables: Definition, Measurement Scales
- 2.2. Types of Data Statistics
  - 2.2.1. According to Type
    - 2.2.1.1. Quantitative: Continuous Data and Discrete Data
    - 2.2.1.2. Qualitative: Binomial Data, Nominal Data and Ordinal Data
  - 2.2.2. According to Its Shape
    - 2.2.2.1. Numeric
    - 2.2.2.2. Text:
    - 2.2.2.3. Logical
  - 2.2.3. According to Its Source
    - 2.2.3.1. Primary
    - 2.2.3.2. Secondary
- 2.3. Life Cycle of Data
  - 2.3.1. Stages of the Cycle
  - 2.3.2. Milestones of the Cycle
  - 2.3.3. FAIR Principles
- 2.4. Initial Stages of the Cycle
  - 2.4.1. Definition of Goals
  - 2.4.2. Determination of Resource Requirements
  - 2.4.3. Gantt Chart
  - 2.4.4. Data Structure
- 2.5. Data Collection
  - 2.5.1. Methodology of Data Collection
  - 2.5.2. Data Collection Tools
  - 2.5.3. Data Collection Channels
- 2.6. Data Cleaning
  - 2.6.1. Phases of Data Cleansing
  - 2.6.2. Data Quality
  - 2.6.3. Data Manipulation (with R)
- 2.7. Data Analysis, Interpretation and Evaluation of Results
  - 2.7.1. Statistical Measures
  - 2.7.2. Relationship Indexes
  - 2.7.3. Data Mining
- 2.8. Datawarehouse
  - 2.8.1. Elements that Comprise It
  - 2.8.2. Design
  - 2.8.3. Aspects to Consider
- 2.9. Data Availability
  - 2.9.1. Access
  - 2.9.2. Uses
  - 2.9.3. Security
- 2.10. Regulatory Framework
  - 2.10.1. Data Protection Law
  - 2.10.2. Good Practices
  - 2.10.3. Other Regulatory Aspects

### Module 3. Data in Artificial Intelligence

- 3.1. Data Science
  - 3.1.1. Data Science
  - 3.1.2. Advanced Tools for Data Scientists
- 3.2. Data, Information and Knowledge
  - 3.2.1. Data, Information and Knowledge
  - 3.2.2. Types of Data
  - 3.2.3. Data Sources
- 3.3. From Data to Information
  - 3.3.1. Data Analysis
  - 3.3.2. Types of Analysis
  - 3.3.3. Extraction of Information from a Dataset
- 3.4. Extraction of Information Through Visualization
  - 3.4.1. Visualization as an Analysis Tool
  - 3.4.2. Visualization Methods
  - 3.4.3. Visualization of a Data Set
- 3.5. Data Quality
  - 3.5.1. Quality Data
  - 3.5.2. Data Cleaning
  - 3.5.3. Basic Data Pre-Processing
- 3.6. Dataset
  - 3.6.1. Dataset Enrichment
  - 3.6.2. The Curse of Dimensionality
  - 3.6.3. Modification of Our Data Set
- 3.7. Unbalance
  - 3.7.1. Classes of Unbalance
  - 3.7.2. Unbalance Mitigation Techniques
  - 3.7.3. Balancing a Dataset
- 3.8. Unsupervised Models
  - 3.8.1. Unsupervised Model
  - 3.8.2. Methods
  - 3.8.3. Classification with Unsupervised Models

- 3.9. Supervised Models
  - 3.9.1. Supervised Model
  - 3.9.2. Methods
  - 3.9.3. Classification with Supervised Models
- 3.10. Tools and Good Practices
  - 3.10.1. Good Practices for Data Scientists
  - 3.10.2. The Best Model
  - 3.10.3. Useful Tools

### Module 4. Data Mining. Selection, Pre-Processing and Transformation

- 4.1. Statistical Inference
  - 4.1.1. Descriptive Statistics vs. Statistical Inference
  - 4.1.2. Parametric Procedures
  - 4.1.3. Non-Parametric Procedures
- 4.2. Exploratory Analysis
  - 4.2.1. Descriptive Analysis
  - 4.2.2. Visualization
  - 4.2.3. Data Preparation
- 4.3. Data Preparation
  - 4.3.1. Integration and Data Cleaning
  - 4.3.2. Normalization of Data
  - 4.3.3. Transforming Attributes
- 4.4. Missing Values
  - 4.4.1. Treatment of Missing Values
  - 4.4.2. Maximum Likelihood Imputation Methods
  - 4.4.3. Missing Value Imputation Using Machine Learning
- 4.5. Noise in the Data
  - 4.5.1. Noise Classes and Attributes
  - 4.5.2. Noise Filtering
  - 4.5.3. The Effect of Noise

- 4.6. The Curse of Dimensionality
  - 4.6.1. *Oversampling*
  - 4.6.2. *Undersampling*
  - 4.6.3. Multidimensional Data Reduction
- 4.7. From Continuous to Discrete Attributes
  - 4.7.1. Continuous Data Vs. Discrete Data
  - 4.7.2. Discretization Process
- 4.8. The Data
  - 4.8.1. Data Selection
  - 4.8.2. Prospects and Selection Criteria
  - 4.8.3. Selection Methods
- 4.9. Instance Selection
  - 4.9.1. Methods for Instance Selection
  - 4.9.2. Prototype Selection
  - 4.9.3. Advanced Methods for Instance Selection
- 4.10. Data Pre-Processing in Big Data Environments

## Module 5. Algorithm and Complexity in Artificial Intelligence

- 5.1. Introduction to Algorithm Design Strategies
  - 5.1.1. Recursion
  - 5.1.2. Divide and Conquer
  - 5.1.3. Other Strategies
- 5.2. Efficiency and Analysis of Algorithms
  - 5.2.1. Efficiency Measures
  - 5.2.2. Measuring the Size of the Input
  - 5.2.3. Measuring Execution Time
  - 5.2.4. Worst, Best and Average Case
  - 5.2.5. Asymptotic Notation
  - 5.2.6. Criteria for Mathematical Analysis of Non-Recursive Algorithms
  - 5.2.7. Mathematical Analysis of Recursive Algorithms
  - 5.2.8. Empirical Analysis of Algorithms
- 5.3. Sorting Algorithms
  - 5.3.1. Concept of Sorting
  - 5.3.2. Bubble Sorting
  - 5.3.3. Sorting by Selection
  - 5.3.4. Sorting by Insertion
  - 5.3.5. Merge Sort
  - 5.3.6. Quick Sort
- 5.4. Algorithms with Trees
  - 5.4.1. Tree Concept
  - 5.4.2. Binary Trees
  - 5.4.3. Tree Paths
  - 5.4.4. Representing Expressions
  - 5.4.5. Ordered Binary Trees
  - 5.4.6. Balanced Binary Trees
- 5.5. Algorithms Using Heaps
  - 5.5.1. Heaps
  - 5.5.2. The Heapsort Algorithm
  - 5.5.3. Priority Queues
- 5.6. Graph Algorithms
  - 5.6.1. Representation
  - 5.6.2. Traversal in Width
  - 5.6.3. Depth Travel
  - 5.6.4. Topological Sorting
- 5.7. Greedy Algorithms
  - 5.7.1. Greedy Strategy
  - 5.7.2. Elements of the Greedy Strategy
  - 5.7.3. Currency Exchange
  - 5.7.4. Traveler's Problem
  - 5.7.5. Backpack Problem
- 5.8. Minimal Path Finding
  - 5.8.1. The Minimum Path Problem
  - 5.8.2. Negative Arcs and Cycles
  - 5.8.3. Dijkstra's Algorithm

- 5.9. Greedy Algorithms on Graphs
  - 5.9.1. The Minimum Covering Tree
  - 5.9.2. Prim's Algorithm
  - 5.9.3. Kruskal's Algorithm
  - 5.9.4. Complexity Analysis
- 5.10. *Backtracking*
  - 5.10.1. Backtracking
  - 5.10.2. Alternative Techniques

## Module 6. Intelligent Systems

- 6.1. Agent Theory
  - 6.1.1. Concept History
  - 6.1.2. Agent Definition
  - 6.1.3. Agents in Artificial Intelligence
  - 6.1.4. Agents in Software Engineering
- 6.2. Agent Architectures
  - 6.2.1. The Reasoning Process of an Agent
  - 6.2.2. Reactive Agents
  - 6.2.3. Deductive Agents
  - 6.2.4. Hybrid Agents
  - 6.2.5. Comparison
- 6.3. Information and Knowledge
  - 6.3.1. Difference between Data, Information and Knowledge
  - 6.3.2. Data Quality Assessment
  - 6.3.3. Data Collection Methods
  - 6.3.4. Information Acquisition Methods
  - 6.3.5. Knowledge Acquisition Methods
- 6.4. Knowledge Representation
  - 6.4.1. The Importance of Knowledge Representation
  - 6.4.2. Definition of Knowledge Representation According to Roles
  - 6.4.3. Knowledge Representation Features

- 6.5. Ontologies
  - 6.5.1. Introduction to Metadata
  - 6.5.2. Philosophical Concept of Ontology
  - 6.5.3. Computing Concept of Ontology
  - 6.5.4. Domain Ontologies and Higher-Level Ontologies
  - 6.5.5. How to Build an Ontology
- 6.6. Ontology Languages and Ontology Creation Software
  - 6.6.1. Triple RDF, Turtle and N
  - 6.6.2. RDF Schema
  - 6.6.3. OWL
  - 6.6.4. SPARQL
  - 6.6.5. Introduction to Ontology Creation Tools
  - 6.6.6. Installing and Using Protégé
- 6.7. Semantic Web
  - 6.7.1. Current and Future Status of the Semantic Web
  - 6.7.2. Semantic Web Applications
- 6.8. Other Knowledge Representation Models
  - 6.8.1. Vocabulary
  - 6.8.2. Global Vision
  - 6.8.3. Taxonomy
  - 6.8.4. Thesauri
  - 6.8.5. Folksonomy
  - 6.8.6. Comparison
  - 6.8.7. Mind Maps
- 6.9. Knowledge Representation Assessment and Integration
  - 6.9.1. Zero-Order Logic
  - 6.9.2. First-Order Logic
  - 6.9.3. Descriptive Logic
  - 6.9.4. Relationship between Different Types of Logic
  - 6.9.5. Prolog: Programming Based on First-Order Logic

- 6.10. Semantic Reasoners, Knowledge-Based Systems and Expert Systems
  - 6.10.1. Concept of Reasoner
  - 6.10.2. Reasoner Applications
  - 6.10.3. Knowledge-Based Systems
  - 6.10.4. MYCIN: History of Expert Systems
  - 6.10.5. Expert Systems Elements and Architecture
  - 6.10.6. Creating Expert Systems

## Module 7. Machine Learning and Data Mining

- 7.1. Introduction to Knowledge Discovery Processes and Basic Concepts of Machine Learning
  - 7.1.1. Key Concepts of Knowledge Discovery Processes
  - 7.1.2. Historical Perspective of Knowledge Discovery Processes
  - 7.1.3. Stages of the Knowledge Discovery Processes
  - 7.1.4. Techniques Used in Knowledge Discovery Processes
  - 7.1.5. Characteristics of Good Machine Learning Models
  - 7.1.6. Types of Machine Learning Information
  - 7.1.7. Basic Learning Concepts
  - 7.1.8. Basic Concepts of Unsupervised Learning
- 7.2. Data Exploration and Pre-Processing
  - 7.2.1. Data Processing
  - 7.2.2. Data Processing in the Data Analysis Flow
  - 7.2.3. Types of Data
  - 7.2.4. Data Transformations
  - 7.2.5. Visualization and Exploration of Continuous Variables
  - 7.2.6. Visualization and Exploration of Categorical Variables
  - 7.2.7. Correlation Measures
  - 7.2.8. Most Common Graphic Representations
  - 7.2.9. Introduction to Multivariate Analysis and Dimensionality Reduction
- 7.3. Decision Trees
  - 7.3.1. ID Algorithm
  - 7.3.2. Algorithm C
  - 7.3.3. Overtraining and Pruning
  - 7.3.4. Result Analysis
- 7.4. Evaluation of Classifiers
  - 7.4.1. Confusion Matrixes
  - 7.4.2. Numerical Evaluation Matrixes
  - 7.4.3. Kappa Statistic
  - 7.4.4. ROC Curves
- 7.5. Classification Rules
  - 7.5.1. Rule Evaluation Measures
  - 7.5.2. Introduction to Graphic Representation
  - 7.5.3. Sequential Overlay Algorithm
- 7.6. Neural Networks
  - 7.6.1. Basic Concepts
  - 7.6.2. Simple Neural Networks
  - 7.6.3. Backpropagation Algorithm
  - 7.6.4. Introduction to Recurrent Neural Networks
- 7.7. Bayesian Methods
  - 7.7.1. Basic Probability Concepts
  - 7.7.2. Bayes' Theorem
  - 7.7.3. Naive Bayes
  - 7.7.4. Introduction to Bayesian Networks
- 7.8. Regression and Continuous Response Models
  - 7.8.1. Simple Linear Regression
  - 7.8.2. Multiple Linear Regression
  - 7.8.3. Logistic Regression
  - 7.8.4. Regression Trees
  - 7.8.5. Introduction to Support Vector Machines (SVM)
  - 7.8.6. Goodness-of-Fit Measures
- 7.9. *Clustering*
  - 7.9.1. Basic Concepts
  - 7.9.2. Hierarchical Clustering
  - 7.9.3. Probabilistic Methods
  - 7.9.4. EM Algorithm
  - 7.9.5. B-Cubed Method
  - 7.9.6. Implicit Methods

- 7.10. Text Mining and Natural Language Processing (NLP)
  - 7.10.1. Basic Concepts
  - 7.10.2. Corpus Creation
  - 7.10.3. Descriptive Analysis
  - 7.10.4. Introduction to Feelings Analysis

## Module 8. Neural Networks, the Basis of Deep Learning

- 8.1. Deep Learning
  - 8.1.1. Types of Deep Learning
  - 8.1.2. Applications of Deep Learning
  - 8.1.3. Advantages and Disadvantages of Deep Learning
- 8.2. Operations
  - 8.2.1. Sum
  - 8.2.2. Product
  - 8.2.3. Transfer
- 8.3. Layers
  - 8.3.1. Input Layer
  - 8.3.2. Hidden Layer
  - 8.3.3. Output Layer
- 8.4. Layer Bonding and Operations
  - 8.4.1. Architecture Design
  - 8.4.2. Connection between Layers
  - 8.4.3. Forward Propagation
- 8.5. Construction of the First Neural Network
  - 8.5.1. Network Design
  - 8.5.2. Establish the Weights
  - 8.5.3. Network Training
- 8.6. Trainer and Optimizer
  - 8.6.1. Optimizer Selection
  - 8.6.2. Establishment of a Loss Function
  - 8.6.3. Establishing a Metric

- 8.7. Application of the Principles of Neural Networks
  - 8.7.1. Activation Functions
  - 8.7.2. Backward Propagation
  - 8.7.3. Parameter Adjustment
- 8.8. From Biological to Artificial Neurons
  - 8.8.1. Functioning of a Biological Neuron
  - 8.8.2. Transfer of Knowledge to Artificial Neurons
  - 8.8.3. Establish Relations Between the Two
- 8.9. Implementation of MLP (Multilayer Perceptron) with Keras
  - 8.9.1. Definition of the Network Structure
  - 8.9.2. Model Compilation
  - 8.9.3. Model Training
- 8.10. Fine Tuning Hyperparameters of Neural Networks
  - 8.10.1. Selection of the Activation Function
  - 8.10.2. Set the Learning Rate
  - 8.10.3. Adjustment of Weights

## Module 9. Deep Neural Networks Training

- 9.1. Gradient Problems
  - 9.1.1. Gradient Optimization Techniques
  - 9.1.2. Stochastic Gradients
  - 9.1.3. Weight Initialization Techniques
- 9.2. Reuse of Pre-Trained Layers
  - 9.2.1. Transfer Learning Training
  - 9.2.2. Feature Extraction
  - 9.2.3. Deep Learning
- 9.3. Optimizers
  - 9.3.1. Stochastic Gradient Descent Optimizers
  - 9.3.2. Optimizers Adam and RMSprop
  - 9.3.3. Moment Optimizers
- 9.4. Learning Rate Programming
  - 9.4.1. Automatic Learning Rate Control
  - 9.4.2. Learning Cycles
  - 9.4.3. Smoothing Terms

- 9.5. Overfitting
  - 9.5.1. Cross Validation
  - 9.5.2. Regularization
  - 9.5.3. Evaluation Metrics
- 9.6. Practical Guidelines
  - 9.6.1. Model Design
  - 9.6.2. Selection of Metrics and Evaluation Parameters
  - 9.6.3. Hypothesis Testing
- 9.7. *Transfer Learning*
  - 9.7.1. Transfer Learning Training
  - 9.7.2. Feature Extraction
  - 9.7.3. Deep Learning
- 9.8. *Data Augmentation*
  - 9.8.1. Image Transformations
  - 9.8.2. Synthetic Data Generation
  - 9.8.3. Text Transformation
- 9.9. Practical Application of Transfer Learning
  - 9.9.1. Transfer Learning Training
  - 9.9.2. Feature Extraction
  - 9.9.3. Deep Learning
- 9.10. Regularization
  - 9.10.1. L and L
  - 9.10.2. Regularization by Maximum Entropy
  - 9.10.3. *Dropout*

## Module 10. Model Customization and Training with TensorFlow

- 10.1. *TensorFlow*
  - 10.1.1. Use of the TensorFlow Library
  - 10.1.2. Model Training with TensorFlow
  - 10.1.3. Operations with Graphs in TensorFlow
- 10.2. TensorFlow and NumPy
  - 10.2.1. NumPy Computing Environment for TensorFlow
  - 10.2.2. Using NumPy Arrays with TensorFlow
  - 10.2.3. NumPy Operations for TensorFlow Graphs

- 10.3. Model Customization and Training Algorithms
  - 10.3.1. Building Custom Models with TensorFlow
  - 10.3.2. Management of Training Parameters
  - 10.3.3. Use of Optimization Techniques for Training
- 10.4. TensorFlow Features and Graphs
  - 10.4.1. Functions with TensorFlow
  - 10.4.2. Use of Graphs for Model Training
  - 10.4.3. Graph Optimization with TensorFlow Operations
- 10.5. Loading and Preprocessing Data with TensorFlow
  - 10.5.1. Loading Data Sets with TensorFlow
  - 10.5.2. Pre-Processing Data with TensorFlow
  - 10.5.3. Using TensorFlow Tools for Data Manipulation
- 10.6. The tfdata API
  - 10.6.1. Using the tf.data API for Data Processing
  - 10.6.2. Construction of Data Streams with tf.data
  - 10.6.3. Using the tf.data API for Model Training
- 10.7. The TFRecord Format
  - 10.7.1. Using the TFRecord API for Data Serialization
  - 10.7.2. TFRecord File Upload with TensorFlow
  - 10.7.3. Using TFRecord Files for Model Training
- 10.8. Keras Pre-Processing Layers
  - 10.8.1. Using the Keras Pre-Processing API
  - 10.8.2. Pre-Processing Pipelined Construction with Keras
  - 10.8.3. Using the Keras Pre-Processing API for Model Training
- 10.9. The TensorFlow Datasets Project
  - 10.9.1. Using TensorFlow Datasets for Data Loading
  - 10.9.2. Preprocessing Data with TensorFlow Datasets
  - 10.9.3. Using TensorFlow Datasets for Model Training
- 10.10. Building a Deep Learning App with TensorFlow
  - 10.10.1. Practical Applications
  - 10.10.2. Building a Deep Learning App with TensorFlow
  - 10.10.3. Model Training with TensorFlow
  - 10.10.4. Using the Application for the Prediction of Results

## Module 11. Deep Computer Vision with Convolutional Neural Networks

- 11.1. The Visual Cortex Architecture
  - 11.1.1. Functions of the Visual Cortex
  - 11.1.2. Theories of Computational Vision
  - 11.1.3. Models of Image Processing
- 11.2. Convolutional Layers
  - 11.2.1. Reuse of Weights in Convolution
  - 11.2.2. Convolution D
  - 11.2.3. Activation Functions
- 11.3. Grouping Layers and Implementation of Grouping Layers with Keras
  - 11.3.1. Pooling and Striding
  - 11.3.2. *Flattening*
  - 11.3.3. Types of Pooling
- 11.4. CNN Architecture
  - 11.4.1. VGG Architecture
  - 11.4.2. AlexNet Architecture
  - 11.4.3. ResNet Architecture
- 11.5. Implementing a CNN ResNet using Keras
  - 11.5.1. Weight Initialization
  - 11.5.2. Input Layer Definition
  - 11.5.3. Output Definition
- 11.6. Use of Pre-Trained Keras Models
  - 11.6.1. Characteristics of Pre-Trained Models
  - 11.6.2. Uses of Pre-Trained Models
  - 11.6.3. Advantages of Pre-Trained Models
- 11.7. Pre-Trained Models for Transfer Learning
  - 11.7.1. Learning by Transfer
  - 11.7.2. Transfer Learning Process
  - 11.7.3. Advantages of Transfer Learning
- 11.8. Deep Computer Vision Classification and Localization
  - 11.8.1. Image Classification
  - 11.8.2. Localization of Objects in Images
  - 11.8.3. Object Detection

- 11.9. Object Detection and Object Tracking
  - 11.9.1. Object Detection Methods
  - 11.9.2. Object Tracking Algorithms
  - 11.9.3. Tracking and Localization Techniques
- 11.10. Semantic Segmentation
  - 11.10.1. Deep Learning for Semantic Segmentation
  - 11.10.1. Edge Detection
  - 11.10.1. Rule-Based Segmentation Methods

## Module 12. Natural Language Processing (NLP) with Recurrent Neural Networks (RNN) and Attention

- 12.1. Text Generation Using RNN
  - 12.1.1. Training an RNN for Text Generation
  - 12.1.2. Natural Language Generation with RNN
  - 12.1.3. Text Generation Applications with RNN
- 12.2. Training Data Set Creation
  - 12.2.1. Preparation of the Data for Training an RNN
  - 12.2.2. Storage of the Training Dataset
  - 12.2.3. Data Cleaning and Transformation
  - 12.2.4. Sentiment Analysis
- 12.3. Classification of Opinions with RNN
  - 12.3.1. Detection of Themes in Comments
  - 12.3.2. Sentiment Analysis with Deep Learning Algorithms
- 12.4. Encoder-Decoder Network for Neural Machine Translation
  - 12.4.1. Training an RNN for Machine Translation
  - 12.4.2. Use of an Encoder-Decoder Network for Machine Translation
  - 12.4.3. Improving the Accuracy of Machine Translation with RNNs
- 12.5. Attention Mechanisms
  - 12.5.1. Application of Care Mechanisms in RNN
  - 12.5.2. Use of Care Mechanisms to Improve the Accuracy of the Models
  - 12.5.3. Advantages of Attention Mechanisms in Neural Networks

- 12.6. Transformer Models
  - 12.6.1. Using Transformers Models for Natural Language Processing
  - 12.6.2. Application of Transformers Models for Vision
  - 12.6.3. Advantages of Transformers Models
- 12.7. Transformers for Vision
  - 12.7.1. Use of Transformers Models for Vision
  - 12.7.2. Image Data Pre-Processing
  - 12.7.3. Training a Transformers Model for Vision
- 12.8. Hugging Face's Transformers Library
  - 12.8.1. Using Hugging Face's Transformers Library
  - 12.8.2. Hugging Face's Transformers Library Application
  - 12.8.3. Advantages of Hugging Face's Transformers Library
- 12.9. Other Transformers Libraries. Comparison
  - 12.9.1. Comparison Between Different Transformers Libraries
  - 12.9.2. Use of the Other Transformers Libraries
  - 12.9.3. Advantages of the Other Transformers Libraries
- 12.10. Development of an NLP Application with RNN and Attention. Practical Applications
  - 12.10.1. Development of a Natural Language Processing Application with RNN and Attention
  - 12.10.2. Use of RNN, Attention Mechanisms and Transformers Models in the Application
  - 12.10.3. Evaluation of the Practical Application

### Module 13. Autoencoders, GANs and Diffusion Models

- 13.1. Representation of Efficient Data
  - 13.1.1. Dimensionality Reduction
  - 13.1.2. Deep Learning
  - 13.1.3. Compact Representations
- 13.2. PCA Realization with an Incomplete Linear Automatic Encoder
  - 13.2.1. Training Process
  - 13.2.2. Implementation in Python
  - 13.2.3. Use of Test Data
- 13.3. Stacked Automatic Encoders
  - 13.3.1. Deep Neural Networks
  - 13.3.2. Construction of Coding Architectures
  - 13.3.3. Use of Regularization
- 13.4. Convolutional Autoencoders
  - 13.4.1. Design of Convolutional Models
  - 13.4.2. Convolutional Model Training
  - 13.4.3. Results Evaluation
- 13.5. Noise Suppression of Automatic Encoders
  - 13.5.1. Filter Application
  - 13.5.2. Design of Coding Models
  - 13.5.3. Use of Regularization Techniques
- 13.6. Sparse Automatic Encoders
  - 13.6.1. Increasing Coding Efficiency
  - 13.6.2. Minimizing the Number of Parameters
  - 13.6.3. Using Regularization Techniques
- 13.7. Variational Automatic Encoders
  - 13.7.1. Use of Variational Optimization
  - 13.7.2. Unsupervised Deep Learning
  - 13.7.3. Deep Latent Representations
- 13.8. Generation of Fashion MNIST Images
  - 13.8.1. Pattern Recognition
  - 13.8.2. Image Generation
  - 13.8.3. Deep Neural Networks Training
- 13.9. Generative Adversarial Networks and Diffusion Models
  - 13.9.1. Content Generation from Images
  - 13.9.2. Modeling of Data Distributions
  - 13.9.3. Use of Adversarial Networks
- 13.10. Implementation of the Models
  - 13.10.1. Practical Application
  - 13.10.2. Implementation of the Models
  - 13.10.3. Use of Real Data
  - 13.10.4. Results Evaluation

## Module 14. Bio-Inspired Computing

- 4.1. Introduction to Bio-Inspired Computing
  - 14.1.1. Introduction to Bio-Inspired Computing
- 14.2. Social Adaptation Algorithms
  - 14.2.1. Bio-Inspired Computation Based on Ant Colonies
  - 14.2.2. Variants of Ant Colony Algorithms
  - 14.2.3. Particle Cloud Computing
- 14.3. Genetic Algorithms
  - 14.3.1. General Structure
  - 14.3.2. Implementations of the Major Operators
- 14.4. Space Exploration-Exploitation Strategies for Genetic Algorithms
  - 14.4.1. CHC Algorithm
  - 14.4.2. Multimodal Problems
- 14.5. Evolutionary Computing Models (I)
  - 14.5.1. Evolutionary Strategies
  - 14.5.2. Evolutionary Programming
  - 14.5.3. Algorithms Based on Differential Evolution
- 14.6. Evolutionary Computation Models (II)
  - 14.6.1. Evolutionary Models Based on Estimation of Distributions (EDA)
  - 14.6.2. Genetic Programming
- 14.7. Evolutionary Programming Applied to Learning Problems
  - 14.7.1. Rules-Based Learning
  - 14.7.2. Evolutionary Methods in Instance Selection Problems
- 14.8. Multi-Objective Problems
  - 14.8.1. Concept of Dominance
  - 14.8.2. Application of Evolutionary Algorithms to Multi-Objective Problems
- 14.9. Neural Networks (I)
  - 14.9.1. Introduction to Neural Networks
  - 14.9.2. Practical Example with Neural Networks
- 14.10. Neural Networks (II)
  - 14.10.1. Use Cases of Neural Networks in Medical Research
  - 14.10.2. Use Cases of Neural Networks in Economics
  - 14.10.3. Use Cases of Neural Networks in Artificial Vision

## Module 15. Artificial Intelligence: Strategies and Applications

- 15.1. Financial Services
  - 15.1.1. The Implications of Artificial Intelligence (AI) in Financial Services. Opportunities and Challenges
  - 15.1.2. Case Uses
  - 15.1.3. Potential Risks Related to the Use of AI
  - 15.1.4. Potential Future Developments/Uses of AI
- 15.2. Implications of Artificial Intelligence in Healthcare Service
  - 15.2.1. Implications of AI in the Healthcare Sector. Opportunities and Challenges
  - 15.2.2. Case Uses
- 15.3. Risks Related to the Use of AI in Healthcare Service
  - 15.3.1. Potential Risks Related to the Use of AI
  - 15.3.2. Potential Future Developments/Uses of AI
- 15.4. *Retail*
  - 15.4.1. Implications of AI in Retail. Opportunities and Challenges
  - 15.4.2. Case Uses
  - 15.4.3. Potential Risks Related to the Use of AI
  - 15.4.4. Potential Future Developments/Uses of AI
- 15.5. Industry
  - 15.5.1. Implications of AI in Industry. Opportunities and Challenges
  - 15.5.2. Case Uses
- 15.6. Potential Risks Related to the Use of AI in Industry
  - 15.6.1. Case Uses
  - 15.6.2. Potential Risks Related to the Use of AI
  - 15.6.3. Potential Future Developments/Uses of AI
- 15.7. Public Administration
  - 15.7.1. AI Implications for Public Administration. Opportunities and Challenges
  - 15.7.2. Case Uses
  - 15.7.3. Potential Risks Related to the Use of AI
  - 15.7.4. Potential Future Developments/Uses of AI
- 15.8. Educational
  - 15.8.1. AI Implications for Education. Opportunities and Challenges
  - 15.8.2. Case Uses

- 15.8.3. Potential Risks Related to the Use of AI
- 15.8.4. Potential Future Developments/Uses of AI
- 15.9. Forestry and Agriculture
  - 15.9.1. Implications of AI in Forestry and Agriculture. Opportunities and Challenges
  - 15.9.2. Case Uses
  - 15.9.3. Potential Risks Related to the Use of AI
  - 15.9.4. Potential Future Developments/Uses of AI
- 15.10. Human Resources
  - 15.10.1. Implications of AI for Human Resources. Opportunities and Challenges
  - 15.10.2. Case Uses
  - 15.10.3. Potential Risks Related to the Use of AI
  - 15.10.4. Potential Future Developments/Uses of AI

## Module 16. Application of Conversational Assistants in Artificial Intelligence for Nursing

- 16.1. Introduction to Conversational Assistants in AI for Nursing
  - 16.1.1. Context of AI in Health and Its Application in Nursing
  - 16.1.2. Benefits of Conversational Assistants in Nursing Care
  - 16.1.3. Specific Applications in Nursing
  - 16.1.4. Trends in Conversational Assistants in the Healthcare Sector
- 16.2. Types of Conversational Assistants in Healthcare
  - 16.2.1. Types of Conversational Assistants in Healthcare (Synthesia, Heygen)
  - 16.2.2. Differences between Assistants in Support, Diagnostic, and Follow-Up Functions
  - 16.2.3. Examples of Conversational Assistants and Nursing Use Cases
  - 16.2.4. Comparison between Automated Assistants and Hybrid Assistants (with Human Intervention)
- 16.3. Implementation of Conversational Assistants in Healthcare
  - 16.3.1. Advantages of Assistants in the Healthcare Environment for Nurses
  - 16.3.2. Challenges in the Implementation of Assistants in Clinical Processes
  - 16.3.3. Technical Requirements for Implementation in Healthcare
  - 16.3.4. Evaluation of Effectiveness and Benefits in the Educational Healthcare Setting
- 16.4. Creating Personalized Assistants in ChatGPT
  - 16.4.1. Introduction to the Creation of a Chatbot in ChatGPT
  - 16.4.2. Process of Customizing a Nursing Assistant (Part 1)
  - 16.4.3. Process of Customizing a Nursing Assistant (Part 2)
  - 16.4.4. Practical Examples of Personalized Healthcare Assistants
- 16.5. Impact of AI and Automation in the Health Sector
  - 16.5.1. Changes in Job Roles Due to AI
  - 16.5.2. Adaptation of Nursing Professionals to AI Technologies
  - 16.5.3. Effects of Conversational Assistants on the Training of the Healthcare Workforce
  - 16.5.4. Evaluation of the Impact of Automation on the Healthcare Sector
- 16.6. Integrating Conversational Assistants in Nursing Education
  - 16.6.1. Role of Conversational Assistants in Clinical Learning
  - 16.6.2. Using Conversational Assistants in Clinical Case Simulations
  - 16.6.3. Application in Clinical Practice and Decision Making
  - 16.6.4. Tools for Continuing Education with Assistants
- 16.7. Conversational Assistants in the Emotional Support of Patients
  - 16.7.1. Applications of Assistants for Emotional Accompaniment
  - 16.7.2. Examples of Conversational Assistants in Psychological Support
  - 16.7.3. Limitations in the Emotional Support of Conversational Assistants
  - 16.7.4. Considerations for the Use of AI in Emotional Support
- 16.8. Improving Efficiency and Patient Care with AI Assistants
  - 16.8.1. Managing Queries and Frequently Asked Questions with Assistants
  - 16.8.2. Optimizing Patient-Nurse Communication
  - 16.8.3. Assistant Applications in Care Coordination
  - 16.8.4. Evaluation of the Impact of Assistants on Clinical Efficiency
- 16.9. Development and Customization of Conversational Tools for Nurses
  - 16.9.1. Process of Developing a Conversational Nurse Assistant from Scratch
  - 16.9.2. Customization for Specific Nursing Needs
  - 16.9.3. Updating and Continuous Improvement of Conversational Assistants
  - 16.9.4. Implementing Assistants in Various Healthcare Settings
- 16.10. Virtual Learning and Continuing Education in AI for Nursing
  - 16.10.1. Importance of AI Continuous Learning for Nursing
  - 16.10.2. AI E-Learning Platforms and Assistants
  - 16.10.3. AI Professional Development for Healthcare Workers
  - 16.10.4. Future of AI Training for Nursing and Healthcare Workers

## Module 17. Using Artificial Intelligence and Virtual Reality in Emotional Support in Nursing

- 17.1. Introduction to AI-Assisted Emotional Support (Woebot)
  - 17.1.1. Concept and Relevance of Emotional Support in AI
  - 17.1.2. Benefits and Limitations of AI Emotional Support
  - 17.1.3. Main Applications in the Field of Mental Health
  - 17.1.4. Differences with Traditional Emotional Support
- 17.2. Chatbots in Emotional Support
  - 17.2.1. Types of Chatbots Available for Emotional Support (Replika, Wysa)
  - 17.2.2. Examples of Mental Health Chatbots
  - 17.2.3. Limitations of Chatbots in Emotional Support
  - 17.2.4. Case Studies of the Use of Chatbots in the Healthcare Sector
- 17.3. AI Tools for Mental Health (Youper, Koko)
  - 17.3.1. AI Success Stories in Mental Health
  - 17.3.2. Current Emotional Support Tools
  - 17.3.3. Integrating AI in Mental Health Therapies
  - 17.3.4. Measuring the Effectiveness of AI Tools
- 17.4. Privacy and Security in AI-Assisted Emotional Support
  - 17.4.1. Importance of Privacy in AI-Assisted Emotional Support
  - 17.4.2. Privacy Regulations in the Use of AI in Healthcare
  - 17.4.3. Data Security in Emotional Support Systems
  - 17.4.4. Ethics and Protection of Sensitive Information
- 17.5. Comparison between Traditional Emotional Support and Emotional Support with AI
  - 17.5.1. Current Challenges in Both Approaches
  - 17.5.2. Benefits of Combining AI with Traditional Methods
  - 17.5.3. Case Studies in Mixed Emotional Support
  - 17.5.4. Implementation Challenges and Acceptance of AI Support
- 17.6. Virtual Reality in Patient Care (Psious, RelieVRx)
  - 17.6.1. Introduction to Virtual Reality in Healthcare
  - 17.6.2. Virtual Reality Devices and Their Medical Application
  - 17.6.3. Virtual Reality in Patient Preparation
  - 17.6.4. Evolution of Virtual Reality in Healthcare

- 17.7. Virtual Reality Applications in Rehabilitation (MindMotion, VRHealth)
  - 17.7.1. Using Virtual Reality in Motor Rehabilitation
  - 17.7.2. Pain Management Using Virtual Reality
  - 17.7.3. Treatment of Phobias and Anxiety Disorders
  - 17.7.4. Examples of Successful Rehabilitation with Virtual Reality
- 17.8. Ethical Considerations in the Use of Virtual Reality
  - 17.8.1. Ethics in Virtual Reality Treatments
  - 17.8.2. Patient Safety in Virtual Environments
  - 17.8.3. Risks of Addiction and Overexposure to Virtual Reality
  - 17.8.4. Regulations in the Use of Virtual Reality in Healthcare
- 17.9. Comparison of Traditional Treatments and Virtual Reality
  - 17.9.1. Differences in the Effectiveness of Both Approaches
  - 17.9.2. Use Cases for Mixed Treatments
  - 17.9.3. Cost-Benefit Analysis
  - 17.9.4. Expert Opinion on the Use of Virtual Reality
- 17.10. Future of Virtual Reality in Patient Care
  - 17.10.1. Technological Advances in Virtual Reality Applied to Healthcare
  - 17.10.2. Predictions on the Impact of Virtual Reality on Healthcare
  - 17.10.3. Integrating Virtual Reality into Regular Medical Practices
  - 17.10.4. Future Possibilities for Virtual Reality Training

## Module 18. Clinical Management and Personalization of Care with Artificial Intelligence

- 18.1. Introduction to Clinical Management with AI (IBM Watson Health)
  - 18.1.1. Basic Concepts of AI-Assisted Clinical Management
  - 18.1.2. Importance of AI in the Optimization of Clinical Resources
  - 18.1.3. Successful Cases in the Implementation of AI in Hospitals
  - 18.1.4. Analysis of Results and Improvements in Clinical Management
- 18.2. Optimizing Hospital Resources with AI (Qventus)
  - 18.2.1. Bed and Resource Management with AI
  - 18.2.2. AI in Medical Equipment Management
  - 18.2.3. Integration of AI with Existing Hospital Systems
  - 18.2.4. Benefits and Challenges of Automation in Clinical Resources

- 18.3. Comparison of Traditional and AI Tools
  - 18.3.1. Differences in the Efficiency of Traditional and AI Tools
  - 18.3.2. Advantages of AI Tools in Clinical Management
  - 18.3.3. Cost Analysis of Traditional vs. AI Tools
  - 18.3.4. Case Studies of the Application of AI Tools
- 18.4. AI in Schedule and Appointment Management (Zocdoc, Qure4u)
  - 18.4.1. Optimizing Clinical Schedules Using AI
  - 18.4.2. AI for Appointment Management and Consultation Scheduling
  - 18.4.3. Reducing Waiting Times through AI
  - 18.4.4. Efficiency in the Allocation of Time Resources with AI
- 18.5. Remote Patient Monitoring with AI (Current Health, Biofourmis)
  - 18.5.1. Introduction to Remote Patient Monitoring
  - 18.5.2. AI Tools for Remote Monitoring
  - 18.5.3. Early Warning Systems in Assisted Monitoring
  - 18.5.4. Telemedicine Platforms with AI
- 18.6. AI Applications in Chronic Diseases (Glytec, Kaia Health)
  - 18.6.1. Using AI to Monitor Chronic Diseases
  - 18.6.2. Using ORMON CONNECT
  - 18.6.3. Comparison of Traditional and AI-Assisted Monitoring
  - 18.6.4. Benefits of AI in the Management of Chronic Diseases
- 18.7. Ethical Considerations in AI Monitoring
  - 18.7.1. Ethics in the Use of AI in Patient Monitoring
  - 18.7.2. Data Protection in Remote Monitoring
  - 18.7.3. Privacy Regulations in AI Systems
  - 18.7.4. Examples of Successful and Ethical Practices in Monitoring
- 18.8. Personalized Care Management Using AI
  - 18.8.1. Introduction to Personalized Care with AI
  - 18.8.2. Clinical Decision Support Systems
  - 18.8.3. Creating Personalized Advice with ChatGPT
  - 18.8.4. AI Tools for Care Personalization

- 18.9. Care Planning with AI (Mediktor)
  - 18.9.1. Creating Personalized Care Plans
  - 18.9.2. Benefits and Applications of Assisted Care Plans
  - 18.9.3. Comparison of Traditional and Personalized Care
  - 18.9.4. Case Studies of AI Care Plans
- 18.10. Implementing Personalized Nursing Plans
  - 18.10.1. Implementing AI in Personalized Nursing
  - 18.10.2. Case Studies on Care Personalization with AI
  - 18.10.3. Implementation Strategies in Care Plans
  - 18.10.4. Future of AI in Nursing and Personalized Care

## Module 19. Physical Activity Improvement with Artificial Intelligence and Virtual Reality for Nursing

- 19.1. Introduction to AI in Physical Activity (Google Fit)
  - 19.1.1. Importance of AI in the Field of Physical Activity
  - 19.1.2. Applications of AI in Fitness Tracking
  - 19.1.3. Advantages of Using AI to Improve Physical Performance
  - 19.1.4. Successful Cases of AI in Training Optimization
- 19.2. AI Tools for Physical Activity Tracking (Whoop, Google Fit)
  - 19.2.1. Types of AI Tracking Devices
  - 19.2.2. Smart Sensors and Wearables
  - 19.2.3. Advantages of Using AI for Continuous Monitoring
  - 19.2.4. Examples of Monitoring Platforms
- 19.3. Virtual and Augmented Reality in Physical Training
  - 19.3.1. Introduction to Virtual Reality (VR) and Augmented Reality (AR)
  - 19.3.2. Applying VR and AR in Fitness Programs
  - 19.3.3. Benefits of Immersion in Extended Reality Environments
  - 19.3.4. Case Studies of VR and AR Training
- 19.4. Platforms and Apps for Physical Activity Tracking (MyFitnessPal, Jefit)
  - 19.4.1. Mobile Apps for Physical Activity Monitoring
  - 19.4.2. Innovative AI-Based Platforms
  - 19.4.3. Comparison of Traditional and AI Applications
  - 19.4.4. Examples of Popular Platforms

- 19.5. Customizing AI Training Plans
  - 19.5.1. Creating Customized Training Plans
  - 19.5.2. Data Analysis for Real-Time Adjustments
  - 19.5.3. AI in the Optimization of Routines and Targets
  - 19.5.4. Examples of Customized Plans
- 19.6. Motivation and Progress Tracking with AI Tools
  - 19.6.1. AI for Progress and Performance Analysis
  - 19.6.2. AI-Assisted Motivation Techniques
  - 19.6.3. Real-Time Feedback and Personalized Motivation
  - 19.6.4. Success Stories in Improving Exercise Adherence
- 19.7. Comparative Analysis of Traditional and AI Methods
  - 19.7.1. Efficiency of Traditional Methods vs. AI
  - 19.7.2. Costs and Benefits of Using AI in Training
  - 19.7.3. Challenges and Limitations of Technology in Physical Training
  - 19.7.4. Expert Opinion on the Impact of AI
- 19.8. Ethics and Privacy in Monitoring Physical Activity with AI
  - 19.8.1. Protection of Personal Data in AI Tools
  - 19.8.2. Privacy Regulations in AI Devices
  - 19.8.3. Liability in the Use of Physical Activity Data
  - 19.8.4. Ethics in Monitoring and Analysis of Personal Data
- 19.9. Future of AI in Training and Physical Activity
  - 19.9.1. Technological Advances in AI and Fitness
  - 19.9.2. Predictions on the Impact of AI on Physical Activity
  - 19.9.3. Possibilities for Development in Extended Reality
  - 19.9.4. Long-Term Vision of AI in the Sports Environment
- 19.10. Case Studies in Physical Activity Improvement with AI
  - 19.10.1. Case Studies on Training Optimization
  - 19.10.2. Experiences of Users in Improving Their Performance
  - 19.10.3. Analysis of Data from AI and Fitness Studies
  - 19.10.4. Results and Conclusions on the Impact of AI

## Module 20. Optimizing Nutrition and Health Education with Artificial Intelligence in Nursing

- 20.1. Principles of Personalized Nutrition with AI in Nursing
  - 20.1.1. Fundamentals of Personalized Nutrition
  - 20.1.2. Role of AI in Individualized Nutrition
  - 20.1.3. Benefits of Personalization in Nutritional Plans
  - 20.1.4. Examples of Success in Personalized Nutrition
- 20.2. AI Applications for Nutrition
  - 20.2.1. AI Mobile Nutrition Applications (MyFitnessPal, Foodvisor, Yazio)
  - 20.2.2. Dietary Tracking Tools
  - 20.2.3. Comparison of AI Apps for Nutrition
  - 20.2.4. Review of Popular Applications
- 20.3. Personalized Nutrition Assistants
  - 20.3.1. AI for Nutritional Recommendations (Nutrino, Viome, Noom)
  - 20.3.2. Virtual Assistants in Nutrition
  - 20.3.3. Examples of Personalization in Nutrition
  - 20.3.4. Challenges in the Development of Nutritional Assistants
- 20.4. Comparison of Traditional and AI Tools in Nutrition
  - 20.4.1. Effectiveness of Traditional vs. AI Methods
  - 20.4.2. Benefits of AI over Conventional Tools
  - 20.4.3. Costs and Accessibility of AI Tools
  - 20.4.4. Comparative Case Studies
- 20.5. Future of AI-Assisted Nutrition
  - 20.5.1. Technological Innovations in Nutrition
  - 20.5.2. Predictions on the Impact of AI in Nutrition
  - 20.5.3. Future Challenges in the Personalization of Nutrition
  - 20.5.4. Long-Term Vision of AI in Nutrition
- 20.6. AI Tools for Outreach and Health Education
  - 20.6.1. Introduction to AI Tools in Health Education
  - 20.6.2. Guide for Creating Effective Educational Prompts
  - 20.6.3. Introduction to Gemini
  - 20.6.4. Introduction to ChatGPT



- 20.7. Optimizing Educational Searches with AI
  - 20.7.1. AI-Assisted Search Engines
  - 20.7.2. Examples of Search Engines in Health Education
  - 20.7.3. Advanced AI Search Functions
  - 20.7.4. Using Special Operators to Improve Searches
- 20.8. AI-Enhanced Academic Presentations
  - 20.8.1. AI Tools for Academic Presentations
  - 20.8.2. ChatGPT for Scientific Presentations
  - 20.8.3. Gemini for Event Presentations
  - 20.8.4. Additional Platforms such as Gamma.app, Beautiful AI and Tome
- 20.9. Creating Scientific Posters with AI
  - 20.9.1. Introduction to AI Tools for Posters
  - 20.9.2. Visme as a Tool for Scientific Posters
  - 20.9.3. Biorender for Visualizing Scientific Information
  - 20.9.4. Jasper and Canva in the Creation of Posters
- 20.10. Creating Educational Avatars and Assistants
  - 20.10.1. AI Applied to the Creation of Educational Avatars
  - 20.10.2. Conversation Engines for Educational Assistants
  - 20.10.3. Tools such as Heygen and Synthesia
  - 20.10.4. Studio D-ID in the Creation of Interactive Avatars

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*This program composed of 20 academic modules is the most comprehensive in the university landscape on the applications of Artificial Intelligence in Nursing”*

03

# Teaching Objectives

This TECH program is designed to provide nurses with the necessary tools to integrate and apply AI in the clinical setting. To this end, the program addresses advanced data management to the use of virtual assistants and immersive technologies, enabling these professionals to optimize care processes, personalize care, and improve operational efficiency. Therefore, the teaching objectives of this Master's Degree ensure that graduates develop skills in technological innovation, lead digital health projects, and contribute significantly to the transformation of the healthcare sector.



“

*After this TECH program,  
you will be able to lead digital  
health projects from your role  
as a highly specialized nurse”*



## General Objectives

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- ♦ Develop advanced knowledge in artificial intelligence applied to the field of nursing, understanding its impact and potential in the optimization of healthcare processes
- ♦ Identify AI applications in clinical management and personalization of care, improving quality and efficiency
- ♦ Implement conversational assistant tools and chatbots to automate and facilitate communication between patients and nursing professionals
- ♦ Integrate the use of virtual and augmented reality in rehabilitation and pain management, enhancing the recovery and well-being of patients
- ♦ Apply data mining and statistical analysis techniques to improve evidence-based clinical decision-making
- ♦ Use AI-enabled remote monitoring systems for effective follow-up and management of patients with chronic diseases
- ♦ Design and personalize care and nutrition plans using AI tools, promoting individualized and effective approaches
- ♦ Encourage continuous training in AI technologies and their implementation in healthcare settings, ensuring that professionals are up to date





## Specific Objectives

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### Module 1. Fundamentals of Artificial Intelligence

- ♦ Analyze the historical evolution of Artificial Intelligence, from its beginnings to its current state, identifying key milestones and developments
- ♦ Understand the functioning of neural networks and their application in learning models in Artificial Intelligence
- ♦ Study the principles and applications of genetic algorithms, analyzing their usefulness in solving complex problems
- ♦ Analyze the importance of thesauri, vocabularies and taxonomies in structuring and processing data for Artificial Intelligence systems
- ♦ Explore the concept of the semantic web and its influence on the organization and understanding of information in digital environments

### Module 2. Data Types and Life Cycle

- ♦ Understand the fundamental concepts of statistics and their application in data analysis
- ♦ Identify and classify the different types of statistical data, from quantitative to qualitative data
- ♦ Analyze the life cycle of data, from generation to disposal, identifying key stages
- ♦ Explore the initial stages of the data life cycle, highlighting the importance of data planning and structure
- ♦ Study data collection processes, including methodology, tools and collection channels
- ♦ Explore the Datawarehouse concept, with emphasis on the elements that comprise it and its design
- ♦ Analyze the regulatory aspects related to data management, complying with privacy and security regulations, as well as best practices

### Module 3. Data in Artificial Intelligence

- ♦ Master the fundamentals of data science, covering tools, types and sources for information analysis
- ♦ Explore the process of transforming data into information using data mining and visualization techniques
- ♦ Study the structure and characteristics of datasets, understanding their importance in the preparation and use of data for Artificial Intelligence models
- ♦ Analyze supervised and unsupervised models, including methods and classification
- ♦ Use specific tools and best practices in data handling and processing, ensuring efficiency and quality in the implementation of Artificial Intelligence

### Module 4. Data Mining. Selection, Preprocessing and Transformation

- ♦ Master the techniques of statistical inference to understand and apply statistical methods in data mining
- ♦ Perform detailed exploratory analysis of data sets to identify relevant patterns, anomalies, and trends
- ♦ Develop skills for data preparation, including data cleaning, integration, and formatting for use in data mining
- ♦ Implement effective strategies for handling missing values in datasets, applying imputation or elimination methods according to context
- ♦ Identify and mitigate noise present in data, using filtering and smoothing techniques to improve the quality of the data set
- ♦ Address data preprocessing in Big Data environments

### **Module 5. Algorithm and Complexity in Artificial Intelligence**

- ♦ Introduce algorithm design strategies, providing a solid understanding of fundamental approaches to problem solving
- ♦ Analyze the efficiency and complexity of algorithms, applying analysis techniques to evaluate performance in terms of time and space
- ♦ Study and apply sorting algorithms, understanding their performance and comparing their efficiency in different contexts
- ♦ Explore tree-based algorithms, understanding their structure and applications
- ♦ Investigate algorithms with Heaps, analyzing their implementation and usefulness in efficient data manipulation
- ♦ Analyze graph-based algorithms, exploring their application in the representation and solution of problems involving complex relationships
- ♦ Study Greedy algorithms, understanding their logic and applications in solving optimization problems
- ♦ Investigate and apply the backtracking technique for systematic problem solving, analyzing its effectiveness in various scenarios

### **Module 6. Intelligent Systems**

- ♦ Explore agent theory, understanding the fundamental concepts of its operation and its application in Artificial Intelligence and software engineering
- ♦ Study the representation of knowledge, including the analysis of ontologies and their application in the organization of structured information
- ♦ Analyze the concept of the semantic web and its impact on the organization and retrieval of information in digital environments

- ♦ Evaluate and compare different knowledge representations, integrating these to improve the efficiency and accuracy of intelligent systems
- ♦ Study semantic reasoners, knowledge-based systems and expert systems, understanding their functionality and applications in intelligent decision making

### **Module 7. Machine Learning and Data Mining**

- ♦ Introduce the processes of knowledge discovery and the fundamental concepts of machine learning
- ♦ Study decision trees as supervised learning models, understanding their structure and applications
- ♦ Evaluate classifiers using specific techniques to measure their performance and accuracy in data classification
- ♦ Study neural networks, understanding their operation and architecture to solve complex machine learning problems
- ♦ Explore Bayesian methods and their application in machine learning, including Bayesian networks and Bayesian classifiers
- ♦ Analyze regression and continuous response models for predicting numerical values from data
- ♦ Study clustering techniques to identify patterns and structures in unlabeled data sets
- ♦ Explore text mining and natural language processing (NLP), understanding how machine learning techniques are applied to analyze and understand text

### Module 8. Neural Networks, the Basis of Deep Learning

- ♦ Master the fundamentals of Deep Learning, understanding its essential role in Deep Learning
- ♦ Explore the fundamental operations in neural networks and understand their application in model building
- ♦ Analyze the different layers used in neural networks and learn how to select them appropriately
- ♦ Understand the effective linking of layers and operations to design complex and efficient neural network architectures
- ♦ Use trainers and optimizers to tune and improve the performance of neural networks
- ♦ Explore the connection between biological and artificial neurons for a deeper understanding of model design
- ♦ Tune hyperparameters for Fine Tuning of neural networks, optimizing their performance on specific tasks

### Module 9. Deep Neural Networks Training

- ♦ Solve gradient-related problems in deep neural network training
- ♦ Explore and apply different optimizers to improve the efficiency and convergence of models
- ♦ Program the learning rate to dynamically adjust the convergence speed of the model
- ♦ Understand and address overfitting through specific strategies during training

- ♦ Apply practical guidelines to ensure efficient and effective training of deep neural networks
- ♦ Implement Transfer Learning as an advanced technique to improve model performance on specific tasks
- ♦ Explore and apply Data Augmentation techniques to enrich datasets and improve model generalization
- ♦ Develop practical applications using Transfer Learning to solve real-world problems
- ♦ Understand and apply regularization techniques to improve generalization and avoid overfitting in deep neural networks

### Module 10. Model Customization and Training with TensorFlow

- ♦ Master the fundamentals of TensorFlow and its integration with NumPy for efficient data management and calculations
- ♦ Customize models and training algorithms using the advanced capabilities of TensorFlow
- ♦ Explore the tfdata API to efficiently manage and manipulate datasets
- ♦ Implement the TFRecord format for storing and accessing large datasets in TensorFlow
- ♦ Use Keras preprocessing layers to facilitate the construction of custom models
- ♦ Explore the TensorFlow Datasets project to access predefined datasets and improve development efficiency
- ♦ Develop a Deep Learning application with TensorFlow, integrating the knowledge acquired in the module
- ♦ Apply in a practical way all the concepts learned in building and training custom models with TensorFlow in real-world situations

### **Module 11. Deep Computer Vision with Convolutional Neural Networks**

- ♦ Understand the architecture of the visual cortex and its relevance in Deep Computer Vision
- ♦ Explore and apply convolutional layers to extract key features from images
- ♦ Implement clustering layers and their use in Deep Computer Vision models with Keras
- ♦ Analyze various Convolutional Neural Network (CNN) architectures and their applicability in different contexts
- ♦ Develop and implement a CNN ResNet using the Keras library to improve model efficiency and performance
- ♦ Use pre-trained Keras models to leverage transfer learning for specific tasks
- ♦ Apply classification and localization techniques in Deep Computer Vision environments
- ♦ Explore object detection and object tracking strategies using Convolutional Neural Networks
- ♦ Implement semantic segmentation techniques to understand and classify objects in images in a detailed manner

### **Module 12. Natural Language Processing (NLP) with Recurrent Neural Networks (RNN) and Attention**

- ♦ Develop skills in text generation using Recurrent Neural Networks (RNN)
- ♦ Apply RNNs in opinion classification for sentiment analysis in texts
- ♦ Understand and apply attentional mechanisms in natural language processing models
- ♦ Analyze and use Transformers models in specific NLP tasks
- ♦ Explore the application of Transformers models in the context of image processing and computer vision
- ♦ Become familiar with the Hugging Face Transformers library for efficient implementation of advanced models
- ♦ Compare different Transformers libraries to evaluate their suitability for specific tasks
- ♦ Develop a practical application of NLP that integrates RNN and attention mechanisms to solve real-world problems

### **Module 13. Autoencoders, GANs and Diffusion Models**

- ♦ Develop efficient representations of data using Autoencoders, GANs and Diffusion Models
- ♦ Perform PCA using an incomplete linear autoencoder to optimize data representation
- ♦ Implement and understand the operation of stacked autoencoders
- ♦ Explore and apply convolutional autoencoders for efficient visual

data representations

- ♦ Analyze and apply the effectiveness of sparse automatic encoders in data representation
- ♦ Generate fashion images from the MNIST dataset using Autoencoders
- ♦ Understand the concept of Generative Adversarial Networks (GANs) and Diffusion Models
- ♦ Implement and compare the performance of Diffusion Models and GANs in data generation

#### **Module 14. Bio-Inspired Computing**

- ♦ Introduce the fundamental concepts of bio-inspired computing
- ♦ Explore social adaptation algorithms as a key approach in bio-inspired computing
- ♦ Analyze space exploration-exploitation strategies in genetic algorithms
- ♦ Examine models of evolutionary computation in the context of optimization
- ♦ Continue detailed analysis of evolutionary computation models
- ♦ Apply evolutionary programming to specific learning problems
- ♦ Address the complexity of multi-objective problems in the framework of bio-inspired computing
- ♦ Explore the application of neural networks in the field of bio-inspired computing
- ♦ Delve into the implementation and usefulness of neural networks in bio-inspired computing

#### **Module 15. Artificial Intelligence: Strategies and Applications**

- ♦ Develop strategies for the implementation of artificial intelligence in healthcare services
- ♦ Analyze the implications of artificial intelligence in the delivery of healthcare services
- ♦ Identify and assess the risks associated with the use of AI in the healthcare field
- ♦ Assess the potential risks associated with the use of AI in industry
- ♦ Apply artificial intelligence techniques in industry to improve productivity
- ♦ Design artificial intelligence solutions to optimize processes in public administration
- ♦ Evaluate the implementation of AI technologies in the education sector
- ♦ Apply artificial intelligence techniques in forestry and agriculture to improve productivity
- ♦ Optimize human resources processes through the strategic use of artificial intelligence

### **Module 16. Application of Conversational Assistants in Artificial Intelligence for Nursing**

- ♦ Identify the applications and benefits of conversational assistants in the nursing care environment
- ♦ Compare the different typologies of conversational assistants and their specific uses in the healthcare setting
- ♦ Evaluate the challenges and advantages of implementing conversational assistants in clinical processes
- ♦ Design and customize a conversational assistant in ChatGPT for specific nursing needs
- ♦ Analyze the impact of automation and conversational assistants on healthcare staff roles and training
- ♦ Integrate conversational assistants in simulations and continuing education processes in the field of nursing

### **Module 17. Using Artificial Intelligence and Virtual Reality in Emotional Support in Nursing**

- ♦ Describe the concept and relevance of AI-assisted emotional support and how it compares to traditional methods
- ♦ Explore the different types of chatbots and AI tools used in emotional support and their efficacy in mental health
- ♦ Analyze privacy regulations and ethical challenges in the use of AI for emotional support

- ♦ Evaluate the impact of virtual reality in patient preparation and rehabilitation in healthcare settings
- ♦ Identify applications of virtual reality in emotional patient care and rehabilitation
- ♦ Project the future of AI and virtual reality in improving patient care and emotional support

### **Module 18. Clinical Management and Personalization of Care with Artificial Intelligence**

- ♦ Explain how AI optimizes clinical management and hospital resources in healthcare settings
- ♦ Compare the efficiency of traditional and AI-based tools in clinical resource management
- ♦ Evaluate the impact of AI in managing scheduling, appointments and reducing waiting times in the hospital setting
- ♦ Explore the applications of remote monitoring with AI and its relevance to chronic diseases
- ♦ Analyze ethical considerations and privacy regulations in AI-assisted monitoring
- ♦ Design personalized AI-based care plans and study their effective implementation in nursing practice

**Module 19. Physical Activity Improvement with Artificial Intelligence and Virtual Reality for Nursing**

- ♦ Describe the importance and applications of AI in the field of physical activity and physical performance monitoring
- ♦ Analyze the advantages of AI-based tracking devices and the benefits of continuous monitoring
- ♦ Explore the use of virtual and augmented reality in physical training and rehabilitation programs
- ♦ Evaluate the differences in efficiency and cost between traditional methods and AI technologies in physical activity
- ♦ Consider the ethical and privacy implications of AI-assisted fitness tracking
- ♦ Predict future advances of AI in physical activity enhancement and expected technological innovations

**Module 20. Optimizing Nutrition and Health Education with Artificial Intelligence in Nursing**

- ♦ Identify the principles and benefits of AI-assisted personalized nutrition in Nursing practice
- ♦ Compare AI tools for nutrition and evaluate their efficacy in tracking and personalizing diets
- ♦ Develop personalized nutrition assistants using AI technology and study their applications
- ♦ Evaluate the differences in efficiency and accessibility between traditional methods and AI tools in nutrition
- ♦ Analyze the future of AI-assisted nutrition and technology predictions in this field
- ♦ Explore the use of AI in the creation of educational content and tools for health outreach



*Don't miss the opportunity to train with this program that adapts to your schedule and personal obligations to guarantee you the professional improvement you need"*

04

# Career Opportunities

This TECH program is an unparalleled opportunity for all Nursing professionals who wish to update their skills and master Artificial Intelligence tools that have a high impact today in patient care.

Through this cutting-edge knowledge, graduates of the program will be able to expand their career opportunities.





“

*You will apply Artificial Intelligence technologies in clinical settings and perform cutting-edge nursing practice, based on the latest scientific evidence”*

### Graduate Profile

The graduate of this Master's Degree from TECH will be a professional trained to integrate AI technologies in clinical settings, improving care and resource management. They will have the skills to design, implement and evaluate intelligent systems that optimize processes, personalize care and monitor patients effectively. In addition, they will be prepared to address ethical challenges and ensure data security in the use of these technologies. This professional will also be able to lead innovation and research projects in health, as well as promote continuing education on the responsible use of Artificial Intelligence in Nursing.

*You will be able to practice with excellence as a nurse in any health care center, applying innovative tools to perform the appropriate triage of patients"*

- ♦ **Technological Adaptation in Clinical Environments:** Ability to incorporate Artificial Intelligence technologies in Nursing practice, improving the efficiency and quality of patient care
- ♦ **Clinical Problem Solving:** Ability to use critical thinking in identifying and resolving challenges in healthcare, optimizing care through Artificial Intelligence-based solutions
- ♦ **Ethical Commitment and Data Security:** Responsibility in the application of ethical principles and privacy regulations, ensuring the protection of patient data when using advanced technologies
- ♦ **Interdisciplinary Collaboration:** Aptitude for communicating and working effectively with other healthcare professionals and technical teams, facilitating the integration of AI into nursing care

After completing the program, you will be able to use your knowledge and skills in the following positions:

**1. Nurse specialized in Health Technology Innovation:** Is responsible for integrating and managing AI solutions in hospital settings to improve clinical efficiency and patient experience.

Responsibilities: Develop protocols for the use of AI tools and train nurses in their correct application

**2. Nurse in charge of Clinical Data Management:** responsible for the management of large volumes of clinical data using Artificial Intelligence, ensuring its analysis and protection to optimize healthcare.

Responsibilities: Supervise the security and confidentiality of sensitive data stored and processed by Artificial Intelligence systems.

**3. Nurse specialized in Telemedicine with Artificial Intelligence:** in charge of remote patient monitoring, using Artificial Intelligence tools for continuous health assessment and preventive intervention.

Responsibilities: Configure and analyze alerts generated by smart devices, making quick decisions to avoid patient complications.

**4. Consultant in Healthcare AI and Nursing Projects:** dedicated to the implementation of Artificial Intelligence in healthcare environments, collaborating with multidisciplinary teams to ensure that technological solutions are adapted to clinical needs.

Responsibilities: Conduct feasibility studies and provide recommendations on the integration of AI systems into clinical processes.

**5. Internal Trainer in Artificial Intelligence Technologies for Nursing:** From a hospital, clinic or health center, teach specialized courses or workshops about the use of AI tools to healthcare professionals, improving technological competence in the sector.

**Responsibilities:** Design and deliver workshops and hands-on courses for healthcare staff on the safe and efficient use of AI systems.

**6. Nurse in charge of Coordinating Personalized Care:** Responsible for designing and managing individualized care plans, using AI algorithms to adapt to the specific needs of each patient.

**Responsibilities:** Continuously evaluate the results of personalized plans and adjust care strategies based on AI-generated data.

**7. Clinical Innovation Project Supervisor:** lead projects that seek to incorporate AI into nursing practice, improving workflows and optimizing care resources.

**Responsibilities:** Coordinate work teams and ensure that project objectives are met in a timely manner, guaranteeing the quality and safety of innovations.

**8. Healthcare Artificial Intelligence Security and Ethics Nurse:** master the regulations and ethics applied to the use of artificial intelligence in healthcare, in charge of assessing and mitigating risks related to privacy and data management.

**Responsibilities:** Develop policies and best practice guidelines to ensure ethical and legal compliance of AI technologies implemented in healthcare institutions.



*Become a prestigious expert  
in the use of Artificial Intelligence  
tools in nursing practice  
and provide personalized follow-  
ups to your patients"*

### Academic and Research Opportunities

In addition to all the jobs you will be qualified for by studying this TECH Master's Degree, you will also be able to pursue a solid academic and research career. After completing this university program, you will be ready to continue your studies associated with this field of knowledge and thus progressively achieve other scientific merits.

05

# Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.



“

*TECH will prepare you to face new challenges in uncertain environments and achieve success in your career”*

## The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

“

*At TECH you will NOT have live classes  
(which you might not be able to attend)”*



### The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

“

*TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want”*

## Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



## Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

*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.*



## A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



*The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule”*

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

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of 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.

### The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

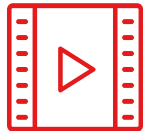
The students' assessment of the quality of teaching, quality of materials, course structure and objectives is excellent. Not surprisingly, the institution became the best rated university by its students on the Trustpilot review platform, obtaining a 4.9 out of 5.

*Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.*

*You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.*



As such, the best educational materials, thoroughly prepared, will be available in this program:



#### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



#### Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



#### Interactive Summaries

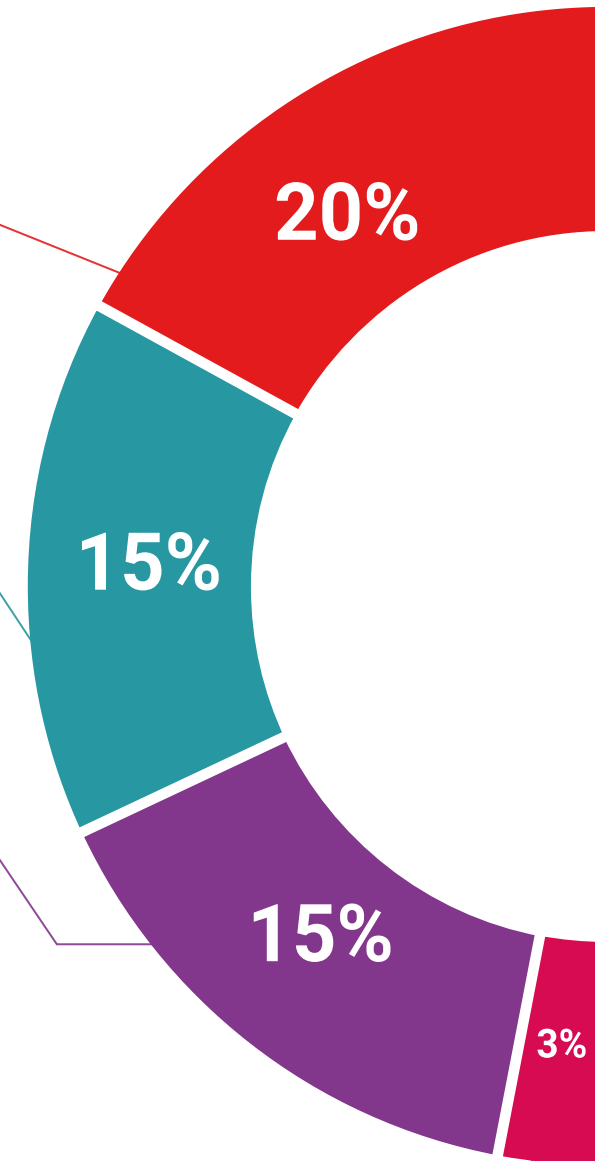
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

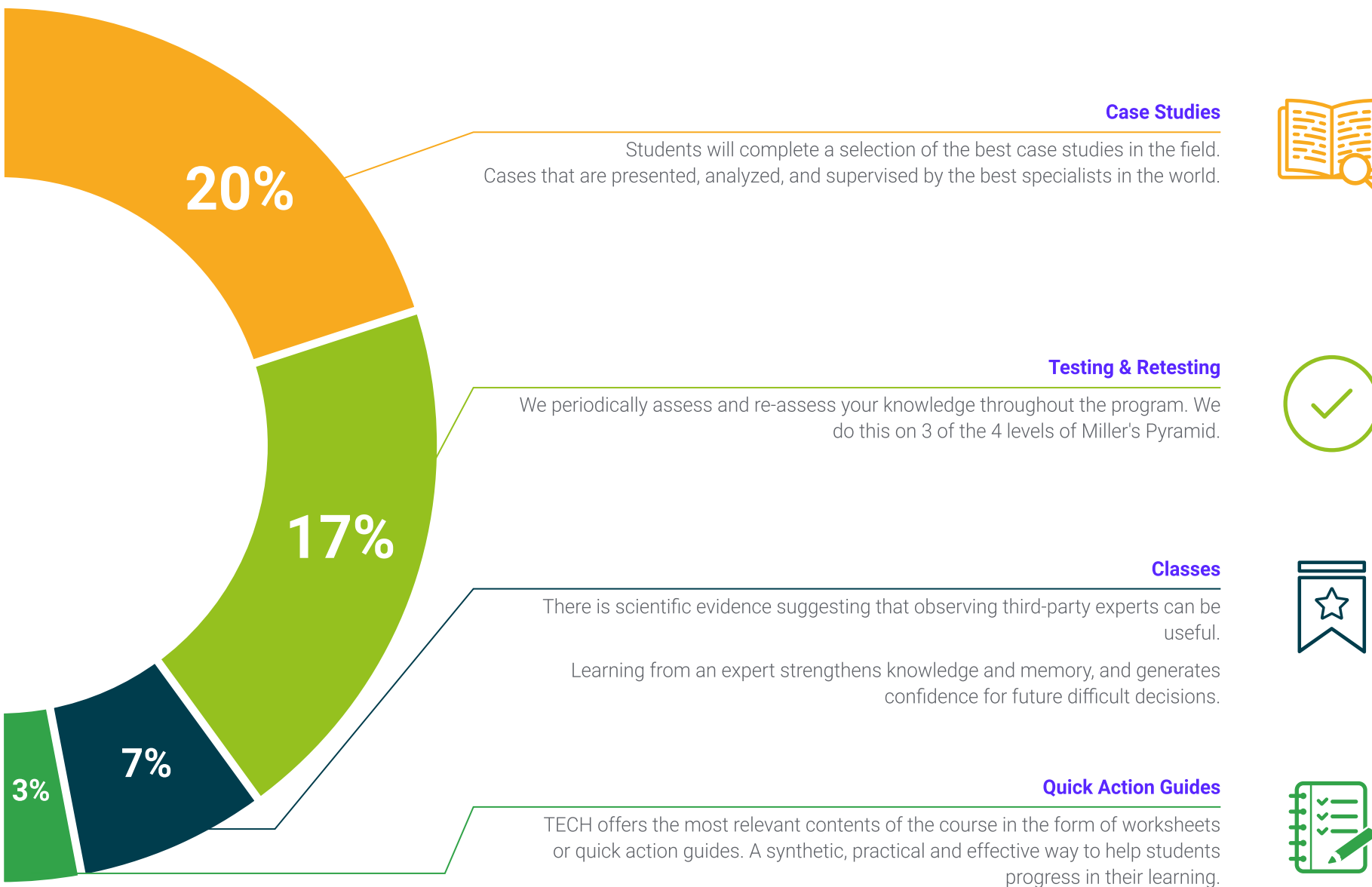
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.





# 06

## Teaching Staff

The faculty selected by TECH for this program have a unique combination of academic experience and clinical practice. These professionals have worked extensively in the integration of digital resources to healthcare, achieving solid knowledge about the potential of Artificial Intelligence in patient care and recovery. Not only have they mastered advanced technologies and their use in nursing environments, but they have also participated in technological innovation projects in prestigious hospitals and clinics. In addition, many of them have contributed relevant research at the intersection of AI and healthcare, ensuring that graduates receive an education based on the latest trends and best practices in the industry.



“

*You will have a prestigious faculty with extensive professional experience, who have mastered all the utilities of Artificial Intelligence in healthcare and facilitate nursing practice”*

## Management



### Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometheus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shepherds GmbH
- Consultant and Strategic Business Advisor at Alliance Medical
- Director of Design and Development at DocPath
- PhD in Psychology from the University of Castilla La Mancha
- PhD in Economics, Business and Finance from the Camilo José Cela University
- PhD in Psychology from University of Castilla La Mancha
- Master's Degree in Executive MBA from the Isabel I University
- Master's Degree in Sales and Marketing Management, Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Master's Degree in Advanced Information Technologies from the University of Castilla La Mancha
- Member of the research group SMILE

## Professors

### Mr. Martín-Palomino Sahagún, Fernando

- ♦ Chief Technology Officer and R+D+i Director at AURA Diagnostics (medTech)
- ♦ Business Development at SARLIN
- ♦ Chief Operating Officer at Alliance Diagnostics
- ♦ Chief Innovation Officer at Alliance Medical
- ♦ Chief Information Officer at Alliance Medical
- ♦ Field Engineer & Project Management in Digital Radiology at Kodak
- ♦ MBA from Polytechnic University of Madrid
- ♦ Executive Master's Degree in Marketing and Sales at ESADE
- ♦ Telecommunications Engineer from the University Alfonso X El Sabio

### Mr. Popescu Radu, Daniel Vasile

- ♦ Independent Specialist in Pharmacology, Nutrition and Dietetics
- ♦ Freelance Producer of Teaching and Scientific Content
- ♦ Nutritionist and Community Dietitian
- ♦ Community Pharmacist
- ♦ Researcher
- ♦ Master's Degree in Nutrition and Health at the Open University of Catalonia
- ♦ Master's Degree in Psychopharmacology from the University of Valencia
- ♦ Pharmacist from the Complutense University of Madrid
- ♦ Nutritionist-Dietitian by the European University Miguel de Cervantes

### Dr. Carrasco González, Ramón Alberto

- ♦ Head of Business Intelligence (Marketing) at Caja General de Ahorros de Granada and Banco Mare Nostrum
- ♦ Head of Information Systems (Data Warehousing and Business Intelligence) at Caja General de Ahorros de Granada and Banco Mare Nostrum
- ♦ Specialist and Research in Computer Science and Artificial Intelligence
- ♦ Doctor in Artificial Intelligence by the University of Granada
- ♦ Higher Engineering Degree in Computer Science from the University of Granada



*An unparalleled faculty is integrated into this program of study to offer you a disruptive and unique academic approach to broaden your professional profile"*

07

# Certificate

The Master's Degree in Artificial Intelligence in Nursing guarantees students, in addition to the most rigorous and up-to-date education, access to a Master's Degree diploma 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 **Master's Degree diploma in Artificial Intelligence in Nursing** 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.

tech global university

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

**Master's Degree in Artificial Intelligence in Nursing**

This is a private qualification of 2700 hours of duration equivalent to 90 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

Unique TECH Code: AFW0R0235 techinstitute.com/certificates

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: **Master's Degree in Artificial Intelligence in Nursing**

Modality: **online**

Duration: **12 months**

Accreditation: **90 ECTS**

tech global university

Mr./Ms. \_\_\_\_\_, with identification document \_\_\_\_\_  
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**Master's Degree in Artificial Intelligence in Nursing**

This is a private qualification of 2700 hours of duration equivalent to 90 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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Dr. Pedro Navarro Illana  
Dean

Unique TECH Code: AFW0R0235 techinstitute.com/certificates



## Master's Degree Artificial Intelligence in Nursing

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Accreditation: 90 ECTS
- » Schedule: at your own pace
- » Exams: online

# Master's Degree

## Artificial Intelligence in Nursing