

# Postgraduate Diploma Intelligent Systems





## Postgraduate Diploma Intelligent Systems

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/pk/information-technology/postgraduate-diploma/postgraduate-diploma-intelligent-systems](http://www.techtitute.com/pk/information-technology/postgraduate-diploma/postgraduate-diploma-intelligent-systems)

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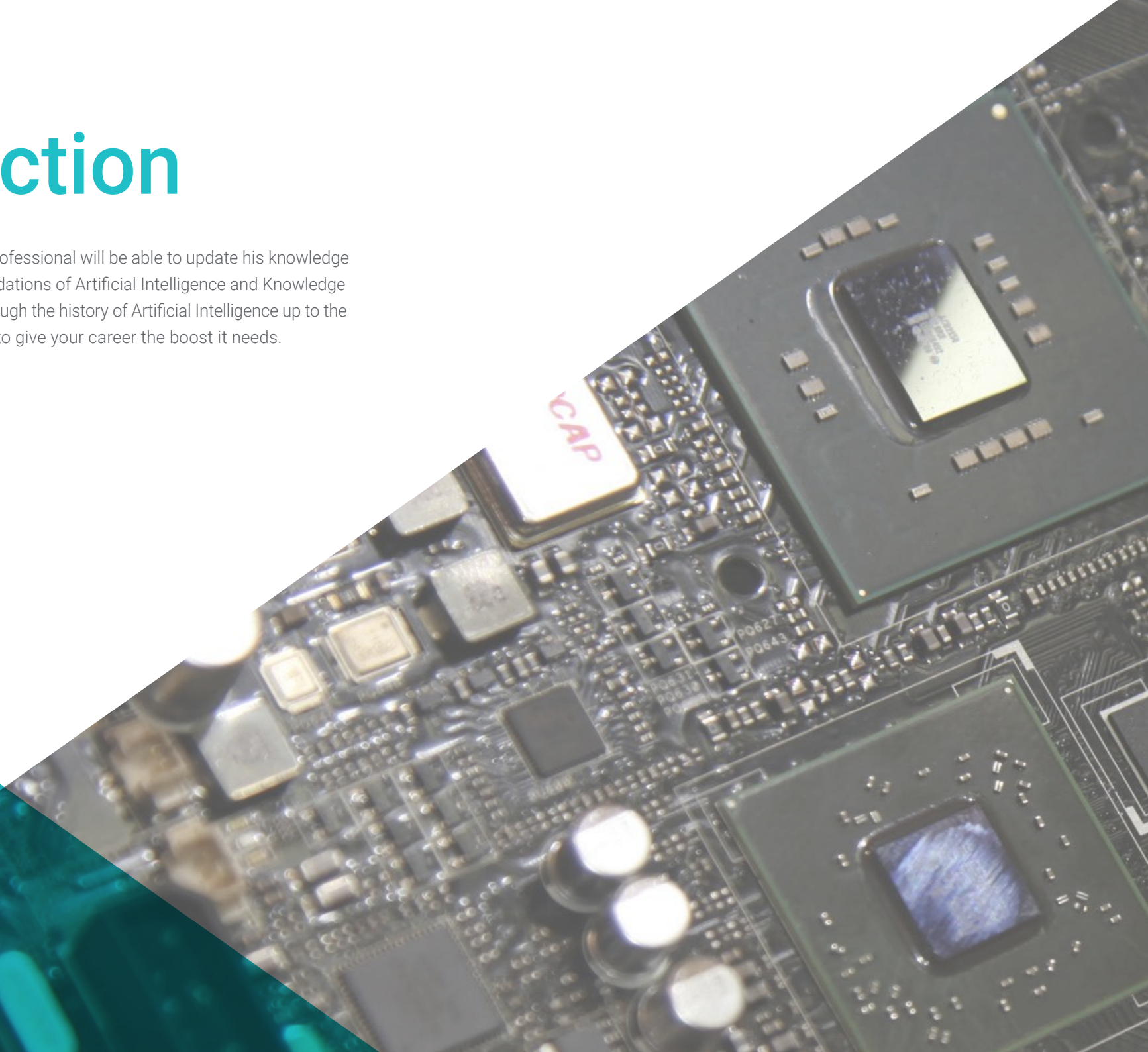
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# 01

# Introduction

With this prestigious training, the professional will be able to update his knowledge in Intelligent Systems. Lay the foundations of Artificial Intelligence and Knowledge Engineering, making a brief tour through the history of Artificial Intelligence up to the present day. A unique opportunity to give your career the boost it needs.





“

*This Postgraduate Diploma will allow you up to date your knowledge in Human Information Systems in a practical way, 100% online, without renouncing to the maximum educational rigor”*

This program is aimed at those interested in attaining a higher level of knowledge Intelligence Systems. The main objective of this Postgraduate Diploma is for students to specialize their knowledge in simulated work environments and conditions in a rigorous and realistic manner so that they can later apply it in the real world.

This program will prepare scientifically and technologically, as well as to develop the professional practice of software engineering, with a transversal and versatile approach adapted to the new technologies and innovations in this field. Students will gain extensive knowledge Intelligence Systems from professionals in the field.

The professional must Seize the opportunity to take this educational program in a 100% online format, without having to give up obligations, which will make it easier to continue studying. Up to date your knowledge and get a Postgraduate Diploma to continue growing personally and professionally.

This **Postgraduate Diploma in Information Systems** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ Development of 100 simulated scenarios presented by experts in Information Systems
- ◆ Its graphic, schematic and practical contents, with which they are conceived, gather scientific and practical information on Information Systems
- ◆ News on the latest developments in Information Systems
- ◆ It contains practical exercises where the self-assessment process can be carried out to improve learning
- ◆ Interactive learning system based on the case method and its application to real practice
- ◆ All of this will be complemented by theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*This program will enhance your skills and update your knowledge of Intelligent Systems”*

“

*Learn about Information Systems with this intensive program from the comfort of your home”*

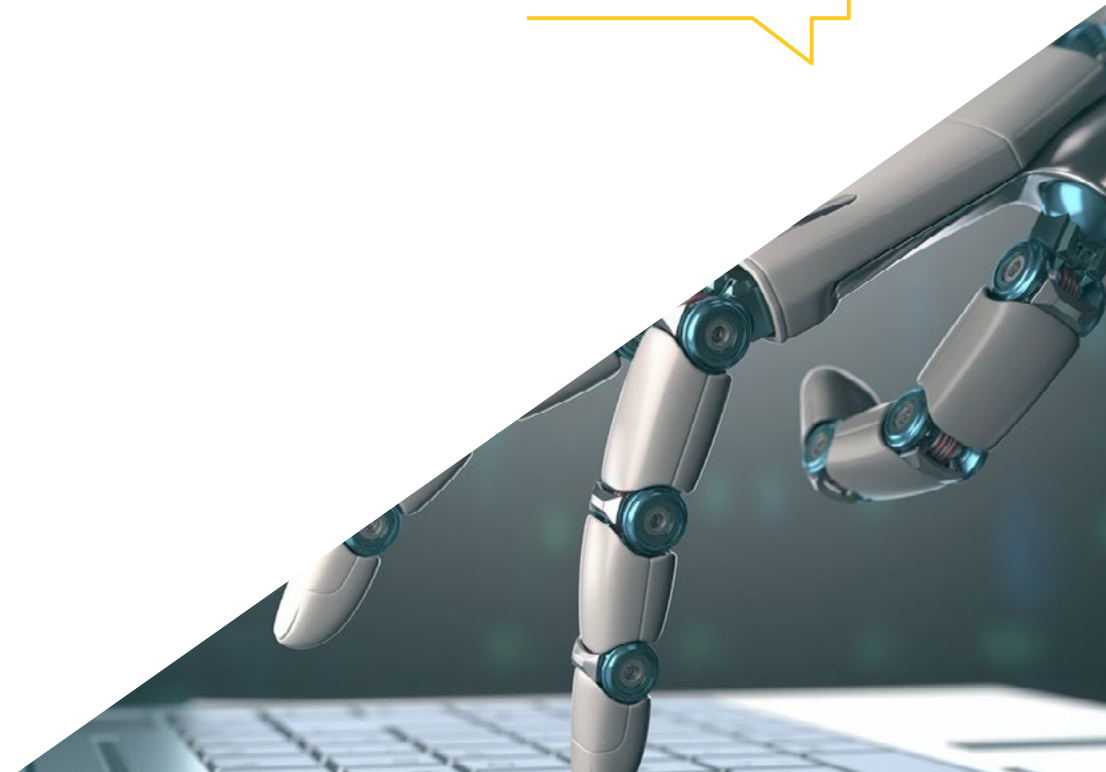
It includes in its teaching staff professionals belonging to the field of education, who bring to this program their work experience, in addition to recognized specialists belonging to reference societies and prestigious universities.

Thanks to its multimedia content developed with the latest educational technology, they will allow the professional a situated and contextual learning, that is to say, a simulated environment that will provide an immersive learning programmed to prepare in real situations.

The program design is based on Problem-Based Learning, through which teachers must try to solve the different professional practice situations that arise throughout the course. To do so, the professional will be assisted by an innovative, interactive video system created by renowned experts in Information Systems with extensive teaching experience.

*Take advantage of the latest educational technology to up to date on Information Systems from the comfort of your home.*

*Learn about the latest techniques in Information Systems from experts in the field.*



# 02 Objectives

The objective of this program is to provide IT professionals with the knowledge and skills necessary to carry out their activity using the most advanced protocols and techniques of the moment. Through a work approach that is totally adaptable to the students, this Postgraduate Diploma will progressively lead them to acquire the competencies that will propel them to a higher professional level.





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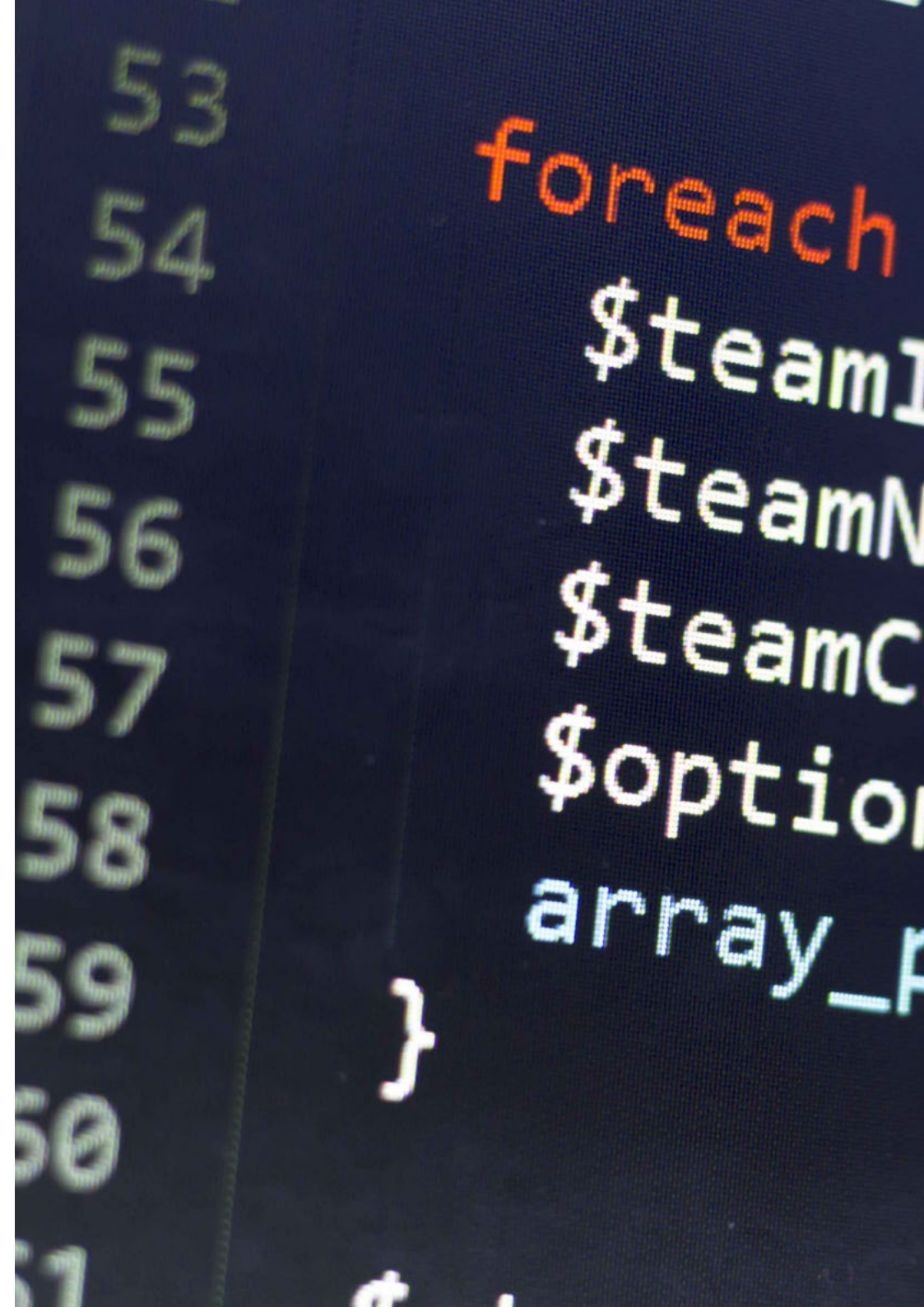
*Achieve professional success as a computer engineer with this intensive program, developed by professionals with extensive experience in the sector”*



## General Objectives

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- ◆ Prepare scientifically and technologically, as well as to develop the professional practice of software engineering, with a transversal and versatile approach adapted to the new technologies and innovations in this field
- ◆ Obtain wide knowledge in the field of IT engineering, structure of computers and Software Engineering, including the mathematical, statistical and physical basis which is essential in engineering





## Specific Objectives

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### Module 1. Intelligent Systems

- ◆ Learn all the concepts related to agent theory and agent architecture and its reasoning process
- ◆ Assimilate the theory and practice behind the concepts of information and knowledge, as well as the different ways of representing knowledge
- ◆ Understand the theory related to ontologies, as well as learn ontology languages and software for ontology creation
- ◆ Learn different models of knowledge representation, such as vocabularies, taxonomies, thesauri and mind maps, among others
- ◆ Understand the functioning of semantic reasoners, knowledge-based systems and expert systems
- ◆ Know how the semantic web works, its current and future state, as well as semantic web-based applications

### Module 2. Artificial Intelligence and Knowledge Engineering

- ◆ Lay the foundations of Artificial Intelligence and Knowledge Engineering, making a brief tour through the history of Artificial Intelligence up to the present day
- ◆ Understand the essential concepts of search in Artificial Intelligence, both informed and uninformed search
- ◆ Understand how Artificial Intelligence works in games
- ◆ Learn the fundamental concepts of neural networks and the use of genetic algorithms
- ◆ Acquire the appropriate mechanisms to represent knowledge, especially taking into account the semantic web
- ◆ Understand the functioning of expert systems and decision support systems

### Module 3. Multiagent Systems and Computational Perception

- ◆ Understand the basic and advanced concepts related to agents and multi-agent systems
- ◆ Study the FIPA agent standard, considering agent communication, agent management and architecture, among other issues
- ◆ Deepen the learning of the JADE (Java Agent Development Framework) platform by , learning to program in it both basic and advanced concepts, including topics of communication and agent discovery
- ◆ Lay the foundations of natural language processing, such as automatic speech recognition and computational linguistics
- ◆ Gain an in-depth understanding of computer vision, digital image analysis, transformation and segmentation of digital images



*Enroll in the best Intelligent Systems Science program on the current university scenario"*

# 03

# Structure and Content

The structure of the contents has been designed by a team of IT engineering professionals, aware of the relevance of current preparation in order to delve into this area of knowledge , in order to humanistically enrich the students and raise the level of knowledge in Information Systems through the latest educational technologies available.



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*This Postgraduate Diploma in Intelligent Systems contains the most complete and up-to-date program of learning the market”*

## Module 1. Intelligent Systems

- 1.1. Agent Theory
  - 1.1.1. Concept History
  - 1.1.2. Agent Definition
  - 1.1.3. Agents in Artificial Intelligence
  - 1.1.4. Agents in Software Engineering
- 1.2. Agent Architectures
  - 1.2.1. The Reasoning Process of an Agent
  - 1.2.2. Reactive Agents
  - 1.2.3. Deductive Agents
  - 1.2.4. Hybrid Agents
  - 1.2.5. Comparison
- 1.3. Information and Knowledge
  - 1.3.1. Difference between Data, Information and Knowledge
  - 1.3.2. Data Quality Assessment
  - 1.3.3. Data Collection Methods
  - 1.3.4. Information Acquisition Methods
  - 1.3.5. Knowledge Acquisition Methods
- 1.4. Knowledge Representation
  - 1.4.1. The Importance of Knowledge Representation
  - 1.4.2. Definition of Knowledge Representation According to Roles
  - 1.4.3. Knowledge Representation Features
- 1.5. Ontologies
  - 1.5.1. Introduction to Metadata
  - 1.5.2. Philosophical Concept of Ontology
  - 1.5.3. Computing Concept of Ontology
  - 1.5.4. Domain Ontologies and Higher-Level Ontologies
  - 1.5.5. Building an Ontology
- 1.6. Ontology Languages and Ontology Creation Software
  - 1.6.1. Triple RDF, Turtle and N3
  - 1.6.2. RDF Schema
  - 1.6.3. OWL
  - 1.6.4. SPARQL
  - 1.6.5. Introduction to Ontology Creation Tools
  - 1.6.6. Installing and Using Protégé
- 1.7. Semantic Web
  - 1.7.1. Current and Future Status of the Semantic Web
  - 1.7.2. Semantic Web Applications
- 1.8. Other Knowledge Representation Models
  - 1.8.1. Vocabulary
  - 1.8.2. Global Vision
  - 1.8.3. Taxonomy
  - 1.8.4. Thesauri
  - 1.8.5. Folksonomy
  - 1.8.6. Comparison
  - 1.8.7. Mind Maps
- 1.9. Knowledge Representation Assessment and Integration
  - 1.9.1. Zero-Order Logic
  - 1.9.2. First-Order Logic
  - 1.9.3. Descriptive Logic
  - 1.9.4. Relationship between Different Types of Logic
  - 1.9.5. Prolog: Programming Based on First-Order Logic
- 1.10. Semantic Reasoners, Knowledge-Based Systems and Expert Systems
  - 1.10.1. Concept of Reasoner
  - 1.10.2. Reasoner Applications
  - 1.10.3. Knowledge-Based Systems
  - 1.10.4. MYCIN: History of Expert Systems
  - 1.10.5. Expert Systems Elements and Architecture
  - 1.10.6. Creating Expert Systems

## Module 2. Artificial Intelligence and Knowledge Engineering

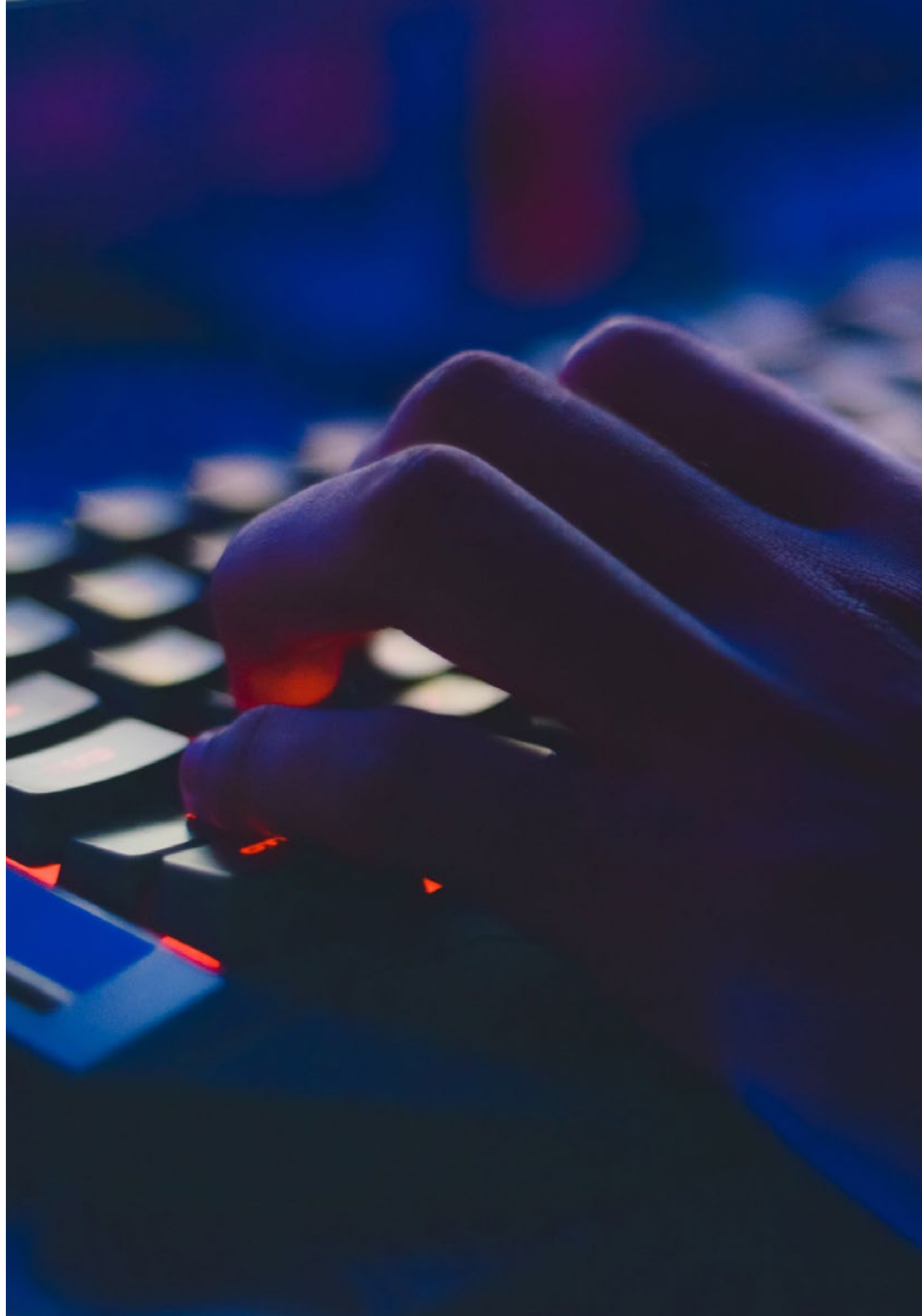
- 2.1. Introduction to Artificial Intelligence and Knowledge Engineering
  - 2.1.1. Brief History of Artificial Intelligence
  - 2.1.2. Artificial Intelligence Today
  - 2.1.3. Knowledge Engineering
- 2.2. Searching
  - 2.2.1. Common Search Concepts
  - 2.2.2. Uninformed Search
  - 2.2.3. Informed Search
- 2.3. Boolean Satisfiability, Constraint Satisfiability and Automatic Planning
  - 2.3.1. Boolean Satisfiability
  - 2.3.2. Constraint Satisfiability Problems
  - 2.3.3. Automatic Planning and PDDL
  - 2.3.4. Planning as a Heuristic Search
  - 2.3.5. Planning with SAT
- 2.4. Artificial Intelligence in Games
  - 2.4.1. Game Theory
  - 2.4.2. Minimax and Alpha-Beta Pruning
  - 2.4.3. Simulation: Monte Carlo
- 2.5. Supervised and Unsupervised Learning
  - 2.5.1. Introduction to Machine Learning
  - 2.5.2. Classification
  - 2.5.3. Regression
  - 2.5.4. Validation of Results
  - 2.5.5. Clustering
- 2.6. Neural Networks
  - 2.6.1. Biological Fundamentals
  - 2.6.2. Computational Model
  - 2.6.3. Supervised and Unsupervised Neural Networks
  - 2.6.4. Simple Perceptron
  - 2.6.5. Multilayer Perceptron.

- 2.7. Genetic Algorithms
  - 2.7.1. History
  - 2.7.2. Biological Basis
  - 2.7.3. Problem Coding
  - 2.7.4. Generation of the Initial Population
  - 2.7.5. Main Algorithm and Genetic Operators
  - 2.7.6. Evaluation of Individuals: Fitness
- 2.8. Thesauri, Vocabularies, Taxonomies
  - 2.8.1. Vocabulary
  - 2.8.2. Taxonomy
  - 2.8.3. Thesauri
  - 2.8.4. Ontologies
- 2.9. Knowledge Representation: Semantic Web
  - 2.9.1. Semantic Web
  - 2.9.2. Specifications RDF, RDFS and OWL
  - 2.9.3. Inference/ Reasoning
  - 2.9.4. Linked Data
- 2.10. Expert systems and DSS
  - 2.10.1. Expert Systems
  - 2.10.2. Decision Support Systems

## Module 3. Multiagent Systems and Computational Perception

- 3.1. Agents and Multiagent Systems
  - 3.1.1. Concept of Agent
  - 3.1.2. Architecture
  - 3.1.3. Communication and Coordination
  - 3.1.4. Programming Languages and Tools
  - 3.1.5. Applications of the Agents
  - 3.1.6. The FIPA

- 3.2. The Standard for Agents: FIPA
  - 3.2.1. Communication between Agents
  - 3.2.2. Agent Management
  - 3.2.3. Abstract Architecture
  - 3.2.4. Other Specifications
- 3.3. The JADE Platform
  - 3.3.1. Software Agents According to JADE
  - 3.3.2. Architecture
  - 3.3.3. Installation and Execution
  - 3.3.4. JADE Packages
- 3.4. Basic Programming with JADE
  - 3.4.1. The Management Console
  - 3.4.2. Basic Creation of Agents
- 3.5. Advanced Programming with JADE
  - 3.5.1. Advanced Creation of Agents
  - 3.5.2. Communication between Agents
  - 3.5.3. Discovering Agents
- 3.6. Computer Vision
  - 3.6.1. Processing and Digital Analysis of Images
  - 3.6.2. Image Analysis and Artificial Vision
  - 3.6.3. Image Processing and Human Vision
  - 3.6.4. Image Capturing System
  - 3.6.5. Image Formation and Perception
- 3.7. Digital Image Analysis
  - 3.7.1. Stages of the Image Analysis Process
  - 3.7.2. Pre-Processing
  - 3.7.3. Basic Operations
  - 3.7.4. Spatial Filtering





- 3.8. Digital Image Transformation and Image Segmentation
  - 3.8.1. Fourier Transform
  - 3.8.2. Frequency Filtering
  - 3.8.3. Basic Concepts
  - 3.8.4. Thresholding
  - 3.8.5. Contour Detection
- 3.9. Shape Recognition
  - 3.9.1. Feature Extraction
  - 3.9.2. Classification Algorithms
- 3.10. Natural Language Processing
  - 3.10.1. Automatic Speech Recognition
  - 3.10.2. Computational Linguistics



*A unique, key, and decisive educational experience to boost your professional development”*

# 04 Methodology

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

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



“

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

## Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

“

*At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world”*



*You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.*



*The student will learn to solve complex situations in real business environments through collaborative activities and real cases.*

### A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

“*Our program prepares you to face new challenges in uncertain environments and achieve success in your career”*

The case method has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, students will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

## Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*In 2019, we obtained the best learning results of all online universities in the world.*

At TECH you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



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.

This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic 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 training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.*

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.



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



### 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.

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.



### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



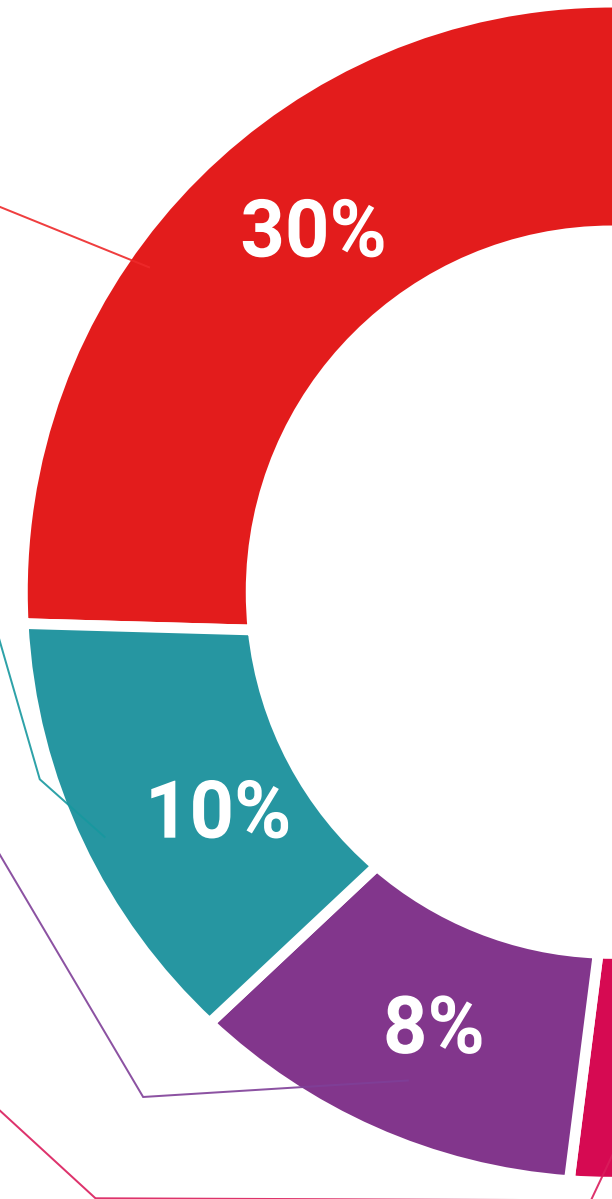
### Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

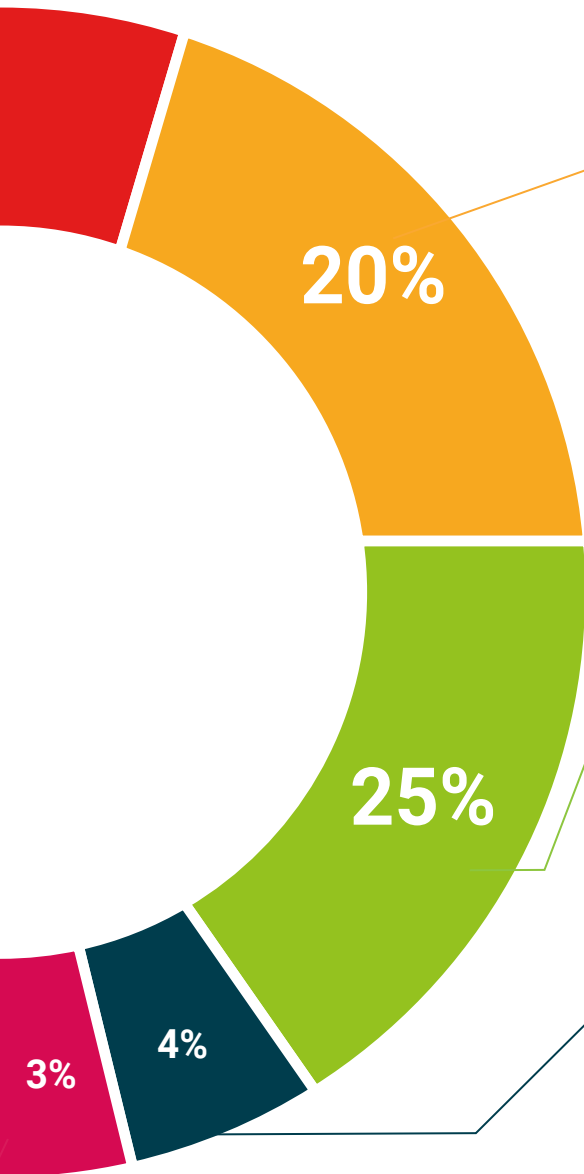


### Additional Reading

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.







#### Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.



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



#### 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.



05

# Certificate

The Postgraduate Diploma in Intelligent Systems guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.



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

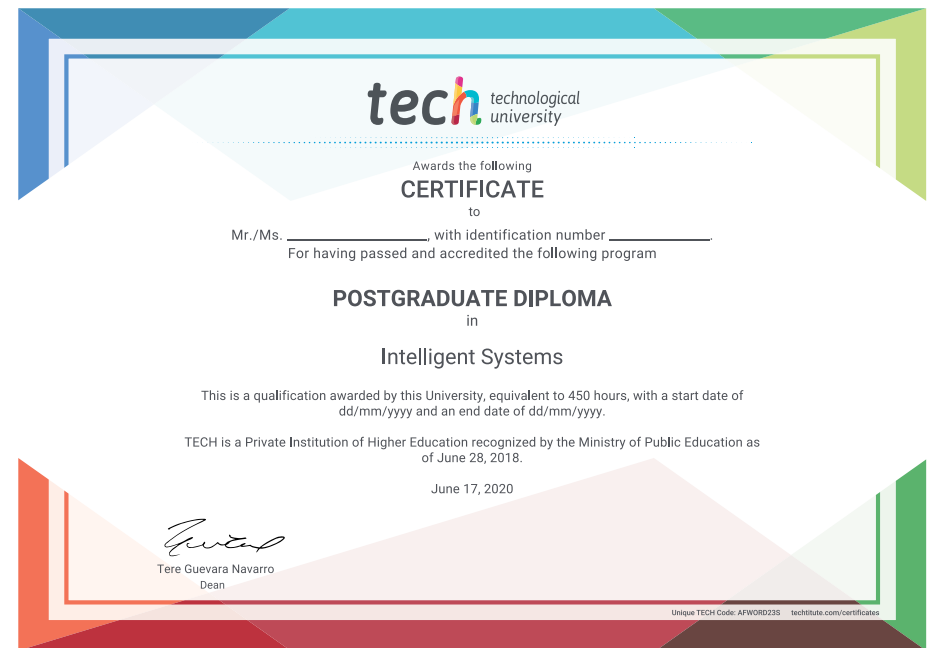
This **Postgraduate Diploma in intelligent Systems** contains the most complete and up-to-date program on the market.

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 Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

**Title: Postgraduate Diploma in intelligent Systems**

**Official N° of Hours: 450 h.**



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

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
development language  
virtual classroom

**tech** technological  
university

## Postgraduate Diploma Intelligent Systems

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
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# Postgraduate Diploma Intelligent Systems