

# Postgraduate Certificate Artificial Intelligence in Systems Engineering and Computer Science



## Postgraduate Certificate Artificial Intelligence in Systems Engineering and Computer Science

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Technological University
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/information-technology/postgraduate-certificate/artificial-intelligence-systems-engineering-computer-science](http://www.techtute.com/us/information-technology/postgraduate-certificate/artificial-intelligence-systems-engineering-computer-science)

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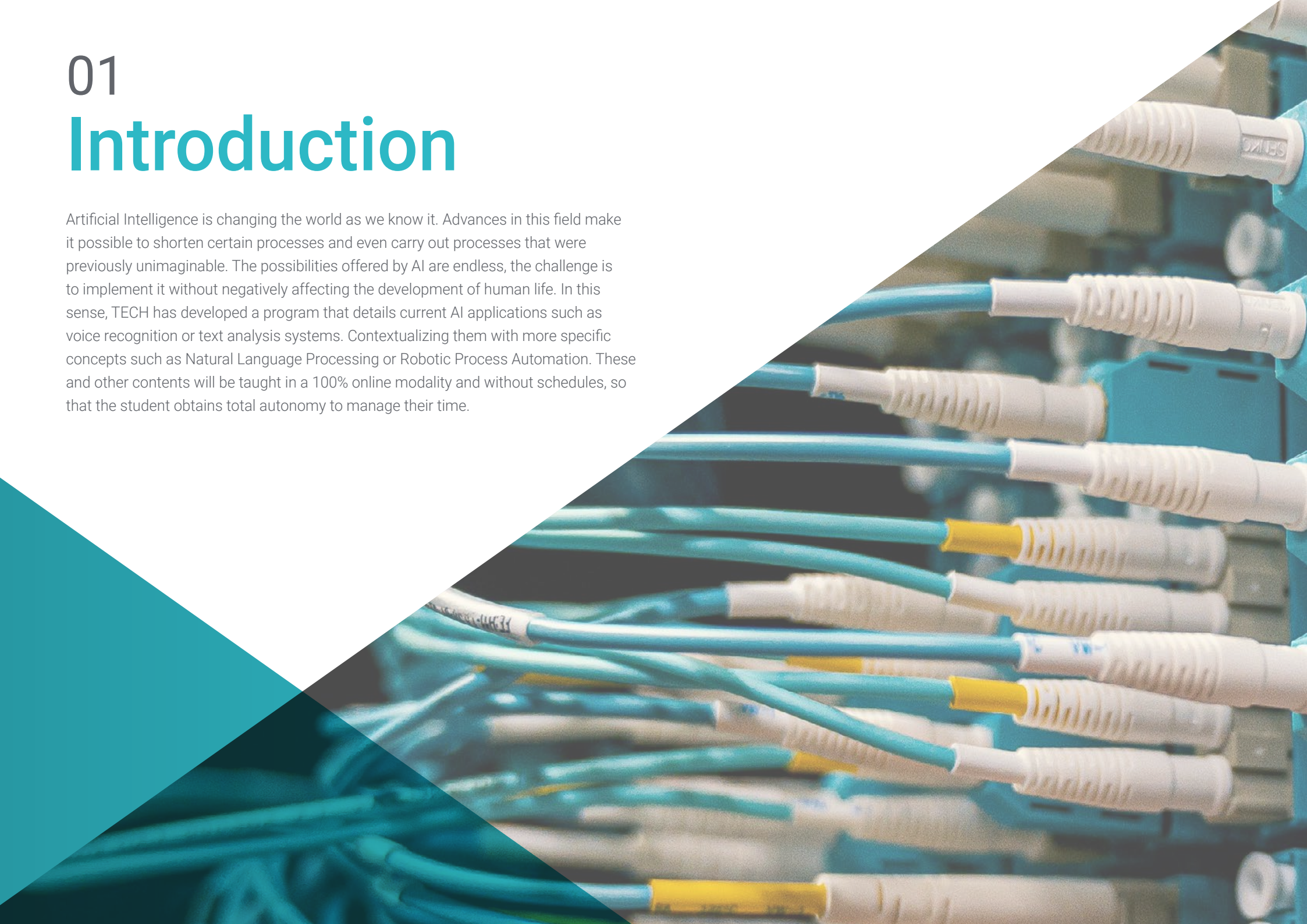
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# 01

# Introduction

Artificial Intelligence is changing the world as we know it. Advances in this field make it possible to shorten certain processes and even carry out processes that were previously unimaginable. The possibilities offered by AI are endless, the challenge is to implement it without negatively affecting the development of human life. In this sense, TECH has developed a program that details current AI applications such as voice recognition or text analysis systems. Contextualizing them with more specific concepts such as Natural Language Processing or Robotic Process Automation. These and other contents will be taught in a 100% online modality and without schedules, so that the student obtains total autonomy to manage their time.





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*The possibilities of Deep Learning are endless. This program will analyze their current characteristics in order to anticipate future developments"*

Machine Learning is sometimes so widespread that it is difficult to identify it. This is the case of YouTube or Netflix recommendation systems. Certain data generated by the user's own interaction on the platform are taken, compared with those of other users with similar characteristics, and a product is offered that is a priori interesting for the user. This technique has reached its maximum exponent in TikTok, where a debate has been generated around the algorithm due to its high level of accuracy.

To approach the subject of AI from an objective point of view, we will begin by explaining how it works and how it manages data. As well as Machine Learning, Deep Learning and a comparison between the two.

Next, Robotic Process Automation (RPA) will be defined for the automation of processes that replicate human actions through the interface of a computer system. And Natural Language Processing (NLP), to study the interactions between computers and human language.

Finally, in terms of AI, we will delve into image recognition, the application of neural networks, their life cycles and the possibilities of new applications, with emphasis on the ethics of the systems and the detection of biases.

All this, through an online modality, without schedules and with the syllabus available in its entirety from the first day. All you need is a device with Internet access. In this way, the students will be able to organize themselves according to their circumstances, therefore favoring learning.

This **Postgraduate Certificate in Artificial Intelligence in Systems Engineering and Computer Science** contains the most complete and up-to-date program on the market.

The most important features include:

- » The development of practical cases presented by experts in Artificial Intelligence in Systems Engineering and Computer Science
- » The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- » Practical exercises where self-assessment can be used to improve learning.
- » Its special emphasis on innovative methodologies
- » Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- » Content that is accessible from any fixed or portable device with an Internet connection



*With TECH, you will learn to identify the differences between supervised learning and unsupervised learning in Machine Learning"*

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*Throughout the Postgraduate Certificate you will learn the keys to Robotic Process Automation, a process automation that is often applied to the help chats of web pages”*

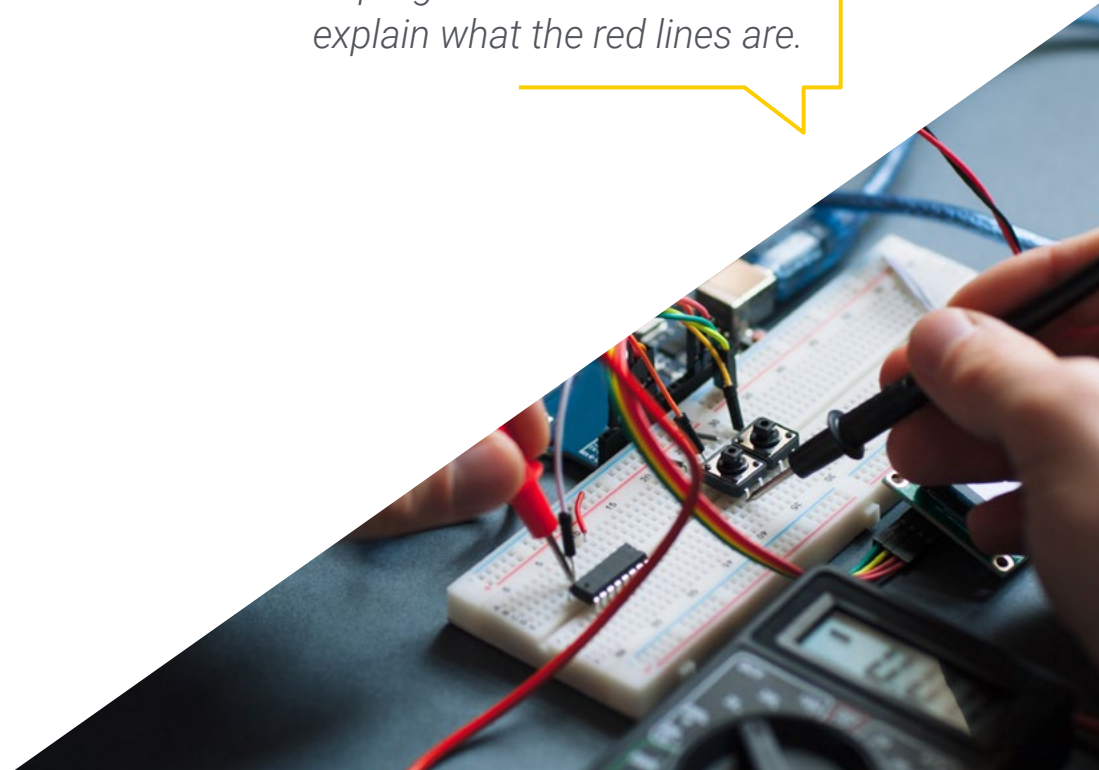
The program’s teaching staff includes professionals from sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

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 academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*With TECH, you will work with algorithms used in image recognition with Artificial Intelligence.*

*Ethics is one of the main barriers to the progress of AI. In TECH we explain what the red lines are.*



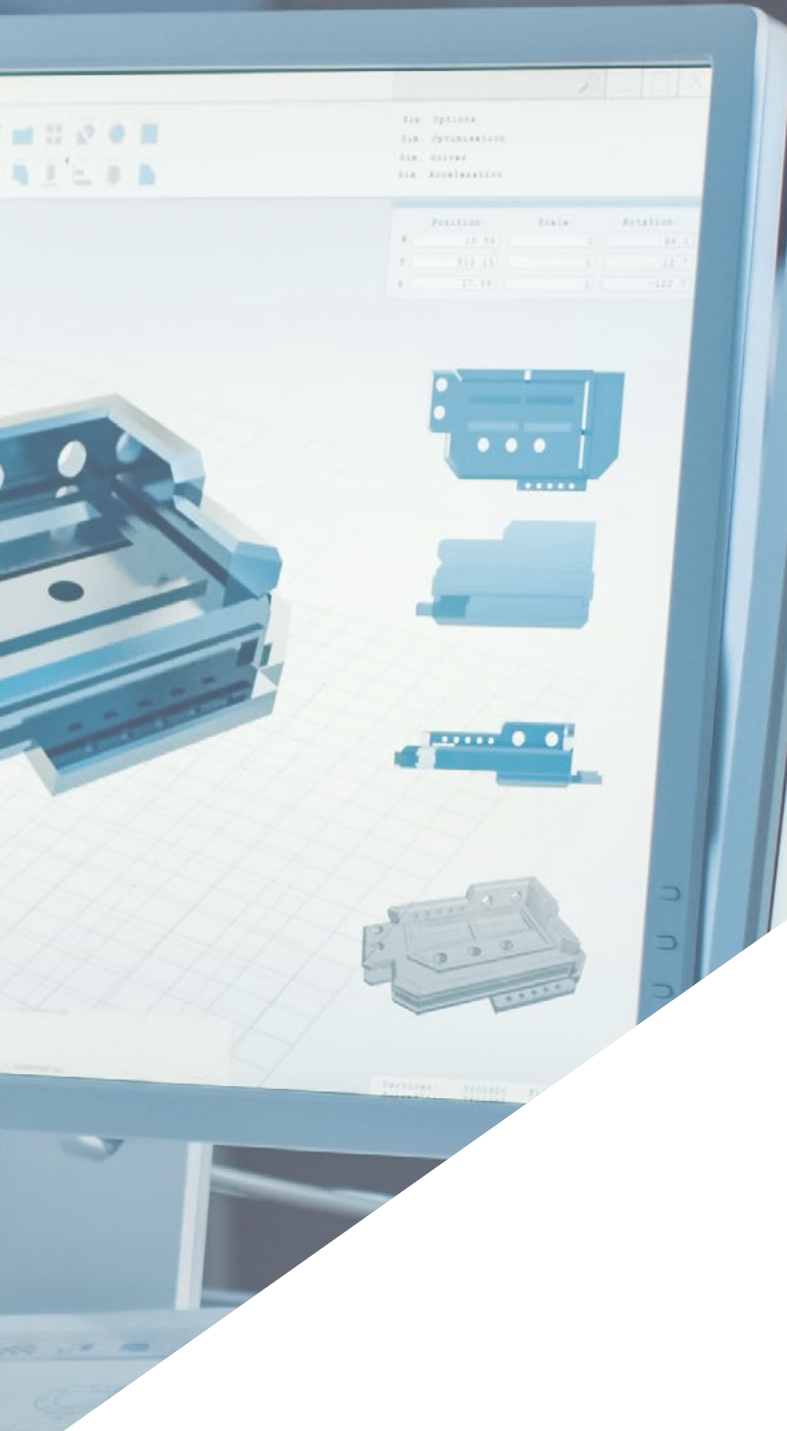


# 02 Objectives

Upon completion of the Postgraduate Certificate in Artificial Intelligence in Systems Engineering and Computer Science, the student will be prepared to generate specific knowledge about AI. They will control advanced techniques of intelligent systems and will know how to apply them in a practical way. They will be able to design automatic reasoning systems and implement them in prediction problems.







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Thanks to TECH, you will be able to identify the different neural network models and their respective learning algorithms”



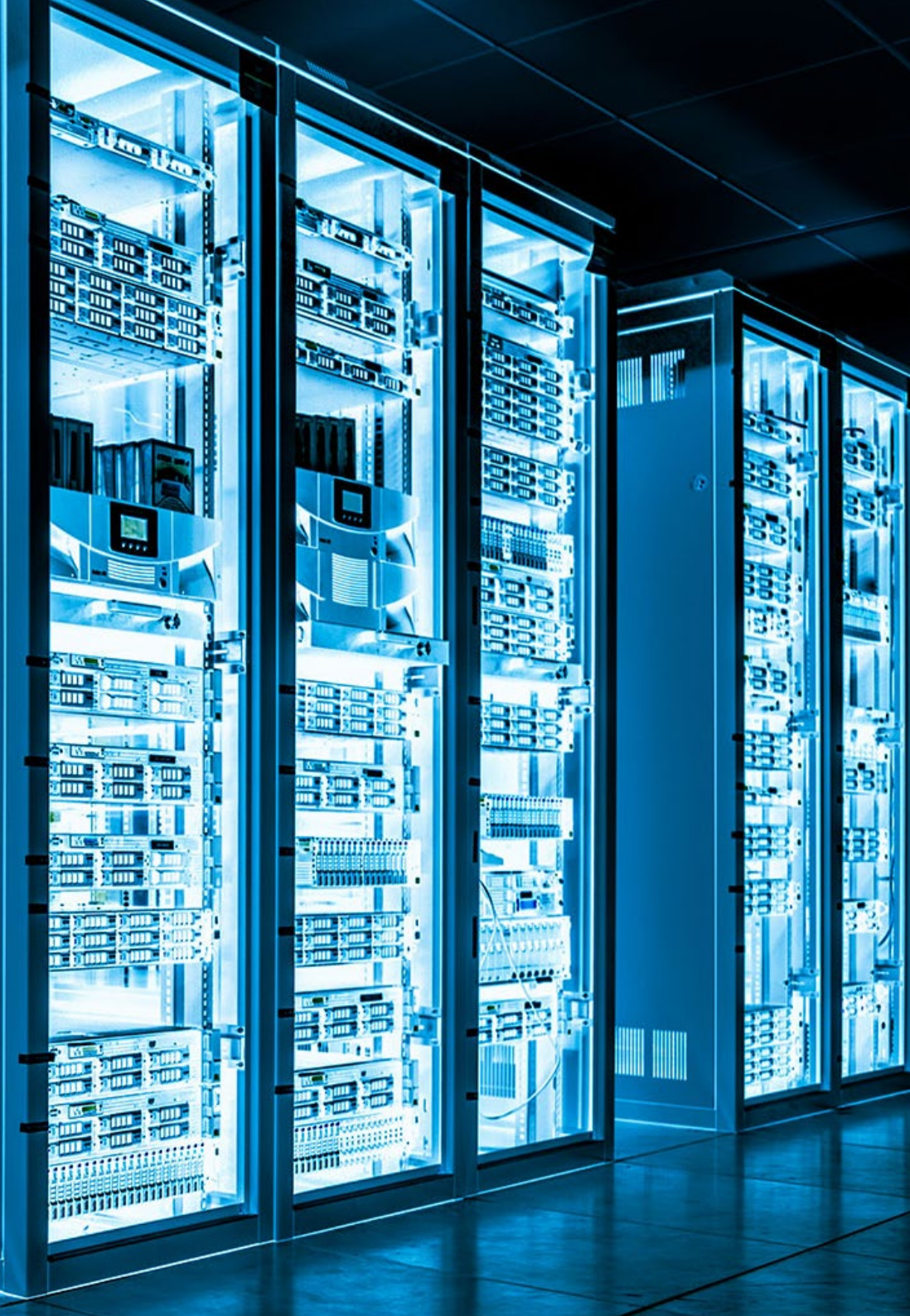
## General Objectives

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- » Generate specialized knowledge on Artificial Intelligence
- » Identify which type of learning (supervised or unsupervised) is most appropriate for a given problem
- » Identify the characteristics of an intelligent system/ agent







## Specific Objectives

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- » Generate specialized knowledge on the application and advanced techniques of intelligent systems and their practical application
- » Formalize and design automatic reasoning systems
- » Implement and apply machine learning techniques in prediction problems
- » Generate specialized knowledge on artificial intelligence

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*This program covers the steps that an Artificial Intelligence has to take from the moment it is conceived until it is put into production”*

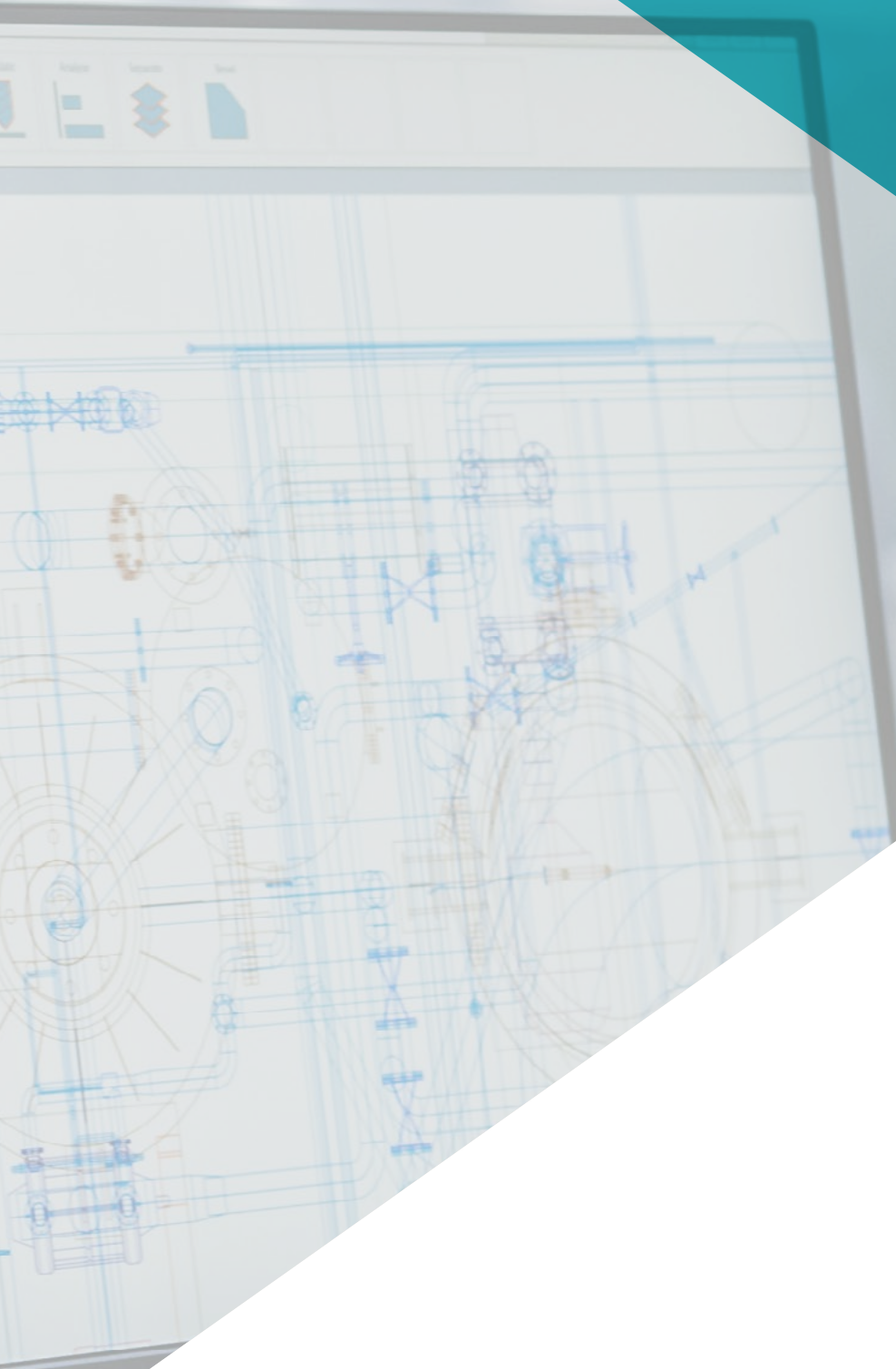


# 03

# Course Management

The field of Artificial Intelligence has a lot to do with the way in which new technologies affect people's lives. Therefore, it requires professionals with a certain humanistic perspective who advocate a balance between machines and people. This has been one of the main criteria for selecting the faculty of this program. As well as the reputation in the professional and educational field of Artificial Intelligence.





“

*This program delves into Machine Learning, one of the most useful branches of Artificial Intelligence today”*

## Management



### Mr. Olalla Bonal, Martín

- » Senior Blockchain Practice Manager at EY.
- » Blockchain Client Technical Specialist for IBM.
- » Director of Architecture for Blocknitive
- » Non-Relational Distributed Databases Team Coordinator for wedoIT (IBM Subsidiary)
- » Infrastructure Architect at Bankia
- » Head of Layout Department at T-Systems
- » Department Coordinator for Bing Data Spain S.L.

## Professors

### Dr. Ceballos van Grieken, Ángel

- » Author of the Project for the Creation of Educational Contents for Mobile Devices
- » Teacher in postgraduate studies related to ICTs
- » Teacher in university studies related to Computer Science
- » Doctor in Education from Los Andes University
- » Specialist in Educational Informatics, Simón Bolívar University





# 04

## Structure and Content

The structure of the Postgraduate Certificate in Artificial Intelligence in Systems Engineering and Computer Science is based on the definition of Artificial Intelligence. To introduce more complex concepts such as Machine Learning, Deep Learning, Robotic Process Automation or Natural Language Processing. It also delves into two of the main aspects of AI: image recognition and neural networks. Finally, it establishes the life cycles and new applications of AI.





“

*Through this program, you will learn about the wide variety of applications of neural networks in Artificial Intelligence”*



## Module 1. Artificial Intelligence in Systems Engineering and Computer Science

- 1.1. Artificial Intelligence
  - 1.1.1. Intelligence in Systems Engineering
  - 1.1.2. Artificial Intelligence
  - 1.1.3. Artificial Intelligence. Advanced Concepts
- 1.2. Importance of Data
  - 1.2.1. Data Ingestion
  - 1.2.2. Analysis and Profiling
  - 1.2.3. Data Refinement
- 1.3. Machine Learning in Artificial Intelligence
  - 1.3.1. Machine Learning
  - 1.3.2. Supervised Learning
  - 1.3.3. Unsupervised Learning
- 1.4. Machine Learning in Artificial Intelligence
  - 1.4.1. Deep Learning vs. Machine Learning
  - 1.4.2. Neural Networks
- 1.5. Robotic Process Automation (RPA) in Artificial Intelligence
  - 1.5.1. RPA in Artificial Intelligence
  - 1.5.2. Process Automation. Good Practices
  - 1.5.3. Process Automation. Continuing Improvement
- 1.6. Natural Language Processing (NLP) in Artificial Intelligence
  - 1.6.1. NLP in Artificial Intelligence
  - 1.6.2. NPL Applied to Software
  - 1.6.3. NLP. Application





- 1.7. Image Recognition in Artificial Intelligence
  - 1.7.1. Models
  - 1.7.2. Algorithms
  - 1.7.3. Applications
- 1.8. Neural Networks in Artificial Intelligence
  - 1.8.1. Models
  - 1.8.2. Learning Algorithms
  - 1.8.3. Applications of Neural Networks in Artificial Intelligence
- 1.9. Artificial Intelligence (AI) Model Life Cycle
  - 1.9.1. Development of the Artificial Intelligence Model
  - 1.9.2. Training
  - 1.9.3. Putting into Production
- 1.10. New Application of Artificial Intelligence
  - 1.10.1. Ethics in AI Systems
  - 1.10.2. Bias Detection
  - 1.10.3. New Artificial Intelligence Applications

“ *TECH has reserved a topic to analyze the biases that can arise in the process of developing an AI*”



# 05 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.



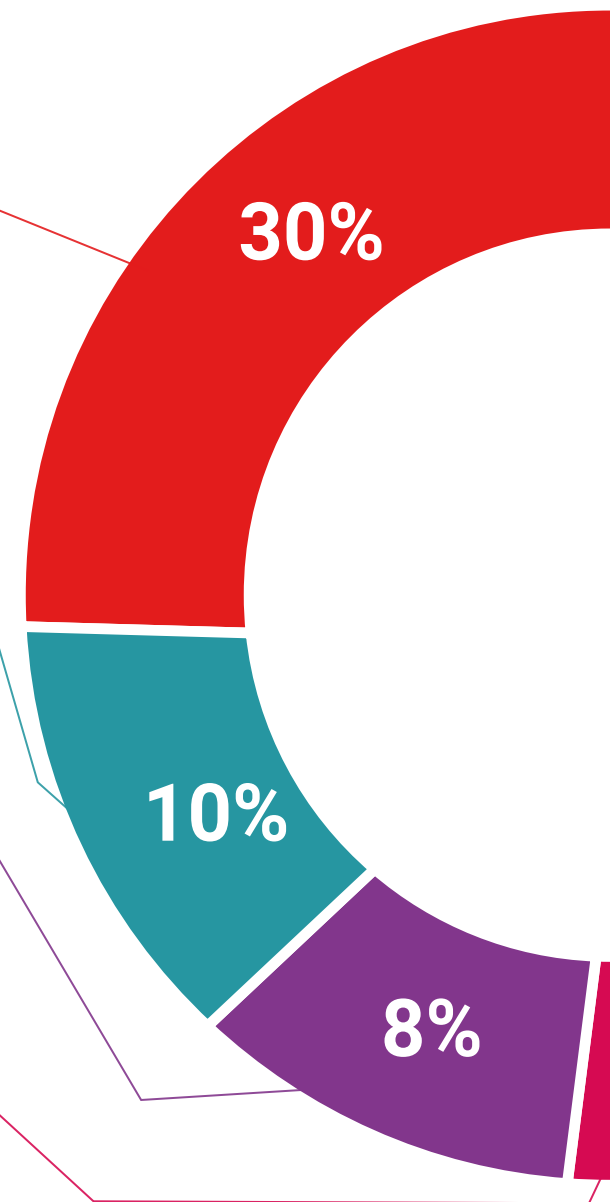
### Practising Skills and Abilities

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.



# 06 Certificate

The Postgraduate Certificate in Artificial Intelligence in Systems Engineering and Computer Science guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate 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"*

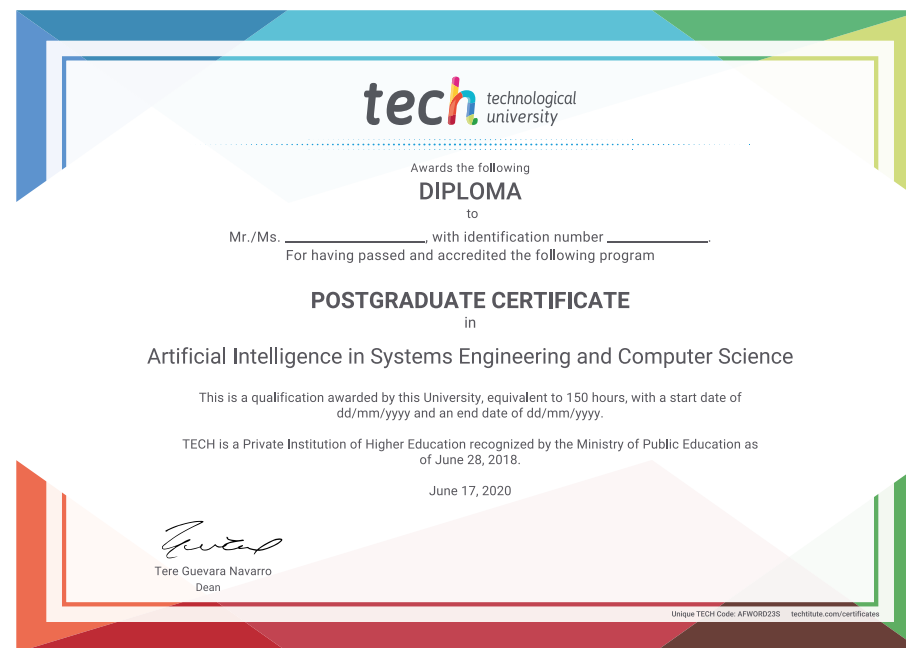
This **Postgraduate Certificate in Artificial Intelligence in Systems Engineering and Computer Science** contains the most complete and up-to-date program on the market.

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

The diploma 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 Certificate in Artificial Intelligence in Systems Engineering and Computer Science**

Official N° of hours: **150 h.**



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





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